



ANCD



*Technical University of Moldova
Faculty of Agricultural, Forest
and Environmental Sciences*



**of the founding of higher
agricultural education
in the Republic
of Moldova**

**International Scientific
Symposium
„MODERN TRENDS
OF AGRICULTURAL
HIGHER
EDUCATION”**

Book of abstracts



October 5-6, 2023

**Chisinau, 2023
Republic of Moldova**



International Scientific Symposium

***MODERN TRENDS IN THE
AGRICULTURAL HIGHER
EDUCATION***

October 5-6, 2023

Book of abstracts

Chisinau, 2023

CZU:082

M84

The book of abstracts of the International Scientific Symposium „MODERN TRENDS IN THE AGRICULTURAL HIGHER EDUCATION”, dedicated to the 90th anniversary of the founding of higher agricultural education in the Republic of Moldova, 05-06 October, 2023 is recommended for publication by the Scientific Council of Faculty of Agricultural, Forest and Environmental Sciences, TUM, from 13 October, 2023, minutes no.1.

Edited by:

POPA Sergiu, Dr., Associate Professor

BALAN Valerian, Dr. Habil., Professor

EREMIA Nicolae, Dr. Habil., Professor

ENCIU Valeriu, Dr. Habil., Professor

MARIAN Grigore, Dr. Habil., Professor

COJOCARU Olesea, Dr., Associate Professor

The publication has not undergone language or professional editing.

The authors are responsible for the content of the contributions.

DESCRIEREA CIP A CAMEREI NAȚIONALE A CĂRȚII DIN REPUBLICA MOLDOVA

"Modern Trends in the Agricultural Higher Education", international scientific symposium (2023; Chisinau).

International Scientific Symposium "Modern Trends in the Agricultural Higher Education", October 5-6, 2023 : Book of Abstracts / edited by Popa Sergiu [et al.] ; scientific committee: Bostan Viorel (president) [et al.]. – Chisinau: [Tehnica-UTM], 2023. – 168 p.

Cerințe de sistem: PDF Reader.

Antetit.: Technical University of Moldova, Faculty of Agricultural, Forest and Environmental Sciences, National Agency for Research and Development.

ISBN 978-9975-64-360-3 (PDF).

082

M 84

©Technical University of Moldova (UTM), 2023



SCIENTIFIC COMMITTEE:

President:

BOSTAN Viorel, Doctor Habil., Professor, UTM Rector, Republic of Moldova

Members:

ABRUDAN Ioan Vasile, Dr., Professor, Rector, Transylvania University of Brasov, Romania

JITĂREANU Gerard, Dr., Professor, Rector, „Ion Ionescu de la Brad” University of Life Sciences of Iasi, Romania

CÎMPEANU Sorin, Dr., Professor, Rector, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania

CĂTOI Cornel, Dr., Professor, Rector, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania

POPESCU Cosmin, Dr., Professor, Rector, University of Life Sciences „Regele Mihai I” of Timisoara, Romania

GĂINĂ Boris, Doctor Habil., Professor, Correspondent Member of ASM, Republic of Moldova

NIKOLAIENKO Stanislav, Academician, Dr., Professor, Rector, National University of Life and Environmental Sciences of Ukraine, Ukraine

CHERNOVOL Mikhail, Academician, Dr., Professor, Rector, Ukrainian National Technical University, Central Kropyvnytskyi (Kirovohrad), Ukraine

SHEBANIN Vyacheslav, Academician, Dr., Professor, Rector, Nikolaev National Agrarian University, Ukraine

MOSTOVIAK Ivan, Dr., Professor, Vice-Rector, National University of Horticulture in Umani, Ukraine

YANCHEVA Hristina, Dr., Professor, Rector, Agricultural University of Plovdiv, Bulgaria

LALEVA Stayka, Dr., Professor, Director of the Agricultural Institute, Stara Zagora, Bulgaria

CIMPOIEȘ Gheorghe, Academician, Dr. Habil., Professor, ASM, Republic of Moldova

BOINCEAN Boris, Academician, Dr. Habil., Professor, Director Public Institution Research Institute for Field Crops „Selection”, Republic of Moldova

STURZA Rodica, Dr. Habil., Professor, UTM, Correspondent Member of ASM, Republic of Moldova

BUGAIAN Larisa, Dr. Habil., Professor, UTM, Republic of Moldova

LÜBBERSTEDT Thomas, Dr., Professor, Iowa State University, SUA

KARADENİZ Turan, Dr., Professor, Pamukkale University, Turkey

BALAN Valerian, Dr. Habil., Professor, UTM, Republic of Moldova

EREMIA Nicolae, Dr. Habil., Professor, UTM, Republic of Moldova

ENCIU Valeriu, Dr. Habil., Professor, UTM, Republic of Moldova

DERENDOVSKAIA Antonina, Dr. Habil., Professor, UTM, Republic of Moldova

MARIAN Grigore, Dr. Habil., Professor, UTM, Republic of Moldova

CUJBA Rodica, Dr., Associate Professor, UTM, Republic of Moldova

ORGANIZING COMMITTEE:

President:

POPA Sergiu, Dr., Associate Professor, Dean, Faculty of Agricultural, Forest and Environmental Sciences (FAFES), UTM, Republic of Moldova

Members:

POPOVICI Mihail, Dr., Associate Professor, Dean, Faculty of Veterinary Medicine, UTM, Republic of Moldova

SUBOTIN Iurie, Dr., Associate Professor, Dean, Faculty of Food Technology, UTM, Republic of Moldova

CILOCI Rafael, Dr., Associate Professor, Dean, Faculty of Economic and Business Engineering, UTM, Republic of Moldova

DÎNTU Sergiu, Dr., Associate Professor, Dean, Faculty of Mechanical, Industrial and Transport Engineering, UTM, Republic of Moldova

CIMPOIEȘ Dragoș, Doctor Habil., Professor, MSU, Republic of Moldova

BATÎRU Grigore, Dr., Associate Professor, FAFES, UTM, Republic of Moldova

MELNIC Iurie, Dr., Associate Professor, FMITE, UTM, Republic of Moldova

SFECLĂ Victor, University Lecturer, Vice-Dean, FAFES, UTM, Republic of Moldova

RÎBINȚEV Ion, Dr., Associate Professor, Head of Department „HF”, FAFES, UTM, Republic of Moldova

SECRIERU Silvia, Dr., Associate Professor, Head of Department „AE”, FAFES, UTM, Republic of Moldova

BIVOL Ludmila, Dr., University Lecturer, Head of Department „ARFS”, FAFES, UTM, Republic of Moldova

COJOCARU Olesea, Dr., Associate Professor, FAFES, UTM, Republic of Moldova

TABLE OF CONTENTS

SESSION I – AGRONOMY	7
Subsection - 1.1. Agronomy	7
Subsection - 1.2. Genetics, breeding and plant biotechnologies	17
Subsection - 1.3. Agroecology	30
SESSION II - HORTICULTURE, FORESTRY AND PLANT PROTECTION	42
Subsection - 2.1 Horticulture	42
Subsection - 2.2 Plant protection	75
Subsection - 2.3 Viticulture and vinification	80
Subsection - 2.4 Forestry and public gardens	85
SESSION III - ANIMAL HUSBANDRY AND AGRI-FOOD SECURITY	104
SESSION IV - VETERINARY MEDICINE	125
SESSION V - AGRICULTURAL ENGINEERING	148
SESSION VI - FOOD TECHNOLOGY	158
SESSION VII - ECONOMICS OF AGRI-FOOD SECTOR AND RURAL DEVELOPMENT	165
Subsection - 7.1 Economy, business and administration	165
Subsection - 7.2. Finance, accounting and economic analysis	168

SESSION I – AGRONOMY

Subsection - 1.1. Agronomy

CZU: 633.15:631.811.98

THE INFLUENCE OF THE COORDINATION COMPOUND OF ZINC ON THE GROWTH AND DEVELOPMENT OF MAIZE PLANTS UNDER MOISTURE DEFICIT CONDITIONS

Brînză Lilia^{1,2}, Danilescu Olga^{2,3}, Bulhac Ion², Guțu Veronica¹

¹*Institute for Research, Innovation and Technology Transfer of „Ion Creangă” of State Pedagogical University, Chisinau, Republic of Moldova*

²*Institute of Chemistry of SUM, Chisinau, Republic of Moldova*

³*Technical University of Moldova, Chisinau, Republic of Moldova*

E-mail: olga.danilescu@chim.utm.md

The use of physiologically active substances with properties than regulate plant growth and development is an important way to mitigate the impact of drought. Zinc is an essential trace element for most crops. This element regulates the biosynthesis of vitamins as well as the metabolism of proteins, carbohydrates and phosphorus nutrients, it increases the content of ascorbic acid, chlorophyll, dry biomass and has the ability to increase plant resistance to extreme temperatures. Based on the major importance of zinc, the purpose of the research was to study the action of the new coordination compound of zinc (CCZn), with the formula $\{[Zn_3(HL)_2(H_2O)_6](SO_4)_2 \cdot 1.5dmf \cdot 2.5H_2O\}_n$, in which $H_2L = 2.6$ -diacetylpyridine bis (isonicotinoylhydrazone). The tested coordination compound was synthesized and analyzed within the Institute of Chemistry of MSU. Experiences were performed under laboratory conditions, and the results of the study demonstrated at the initial stages of ontogenesis beneficial influence of the CCZn on the growth and development of maize seedlings in optimal conditions and moisture insufficiency.

Following the analysis of the results obtained, it was found that both in optimal and drought conditions, seedlings obtained from seeds treated with CCZn differ in higher values of morphological parameters, compared to untreated seedlings grown under the same conditions. In the early stages of plant development, the zinc coordination compound had a positive impact on the growth and development of maize seedlings in the 0.01-0.0001% concentration range. Maximum beneficial effect was obtained when maize seeds were treated with the CCZn solution of 0.001% concentration. The coordination compound of zinc has properties of biologically active substance, manifested by maintaining a significantly higher level of plant growth and biomass accumulation in optimal conditions and water deficiency, compared to the control variant.

Acknowledgments: The research was carried out within the project of the Moldova State Program, 20.80009.5007.28. „Elaboration of new multifunctional materials and efficient technologies for agriculture, medicine, techniques and educational system based on the „s” and „d” metals complexes with polydentate ligands”, funded by ANCD.

Keywords: active physiological substance, coordination compound, drought, maize, Zinc.

CZU: 633.11:631.526.32(478)

RESEARCH ON THE BEHAVIOR OF SOME VARIETIES OF COMMON WHEAT (*TRITICUM AESTIVUM* L.) IN THE CONDITIONS OF THE FOREST-STEPPE OF MOLDOVA

Lungoci Constantin, Nazare Adrian-Ilie, Robu Teodor, Ghițau Carmen Simona, Haraga Lucian Constantin, Țopa Denis, Samuil Costel, Puiu Ioan
University of Life Sciences „Ion Ionescu de la Brad”, Iasi, Romania
E-mail: constantinlungoci@uaiasi.ro

The aim of the study was to evaluate the productive potential of 17 Romanian wheat varieties under conditions in the Moldovan Forest-Steppe, Ezareni farm of USV Iasi. The research was carried out during the 2022/2023 agricultural year, using the classic cultivation technology.

The experiment was arranged in the form of randomization blocks, with 17 variants (varieties), sown in 3 repetitions. The most cultivated local variety - Glosa - was used as a control.

From the biometric data analysis, we can see that the weight of the ear varied between 2.2 g for the „Pitar” variety and 1.2 g for the „Ursita” variety; the number of grains in the ear varied between 58.7 in the „Pitar” variety and 33.3 in the „Glosa” variety; MH varied between 77.1 kg/hl in the „Emisar” variety and 64.5 kg/hl in the „Voinic” variety; the MMB was between 43.5 g for the „Codru” variety and 29.6 g for the „Ursita” variety, and the production varied between 7590.3 kg/ha for the „Andrada” variety and 3283 kg/ha for the „Ursita” variety.

Analyzing the correlations between the analyzed parameters, we can find a close interaction between production-MMB, ear weight-production, but also between the length of the ear and the weight/number of grains in the ear.

Keywords: biometric data analysis, cultivation technology, Iasi, Forest-Steppe of Moldova

THE TOLERANCE OF EARLY MAIZE INBRED LINES TO LOW SOIL TEMPERATURES IN THE SEED'S GERMINATION PHASE

**Musteața Simion, Borozan Pantelimon, Statnic Mihail,
Spînu Alexei, Spînu Valentina**
*Institute of Crop Science „Porumbeni”, Pascani village,
Criuleni district, Republic of Moldova*
E-mail: pantelimon.borozan@yahoo.com

Improving early maize for export to northern areas with reduced thermal conditions requires the identification of parental forms with tolerance to temperatures below the optimal biological threshold of 10-12 °C for seed germination. Each plot with dimensions of 5 m² in two repetitions were planted with 100 untreated grains and distributed of 2 grains in 50 nests spaced at 14 cm. The sowing was performed at a depth of 5-6 cm at the end of March (30-31.03) and the next term over 15 days (14-15.04). Research has included as biological material 48 lines inbred in 2022 and 63 lines in 2023, representing the germplasm of the Euroflint heterotic groups with hardened grain and Iodent, BSSS-B37, Lancaster with dental grain. The experiences were placed in the permanent lot, isolated from the fields assigned to the research crop rotation, processed according to traditional corn technology. In the first decade of March 2022 the average temperature of constituted 8.0 °C compared to 5.6 °C in 2023. In the last decade, the average temperature has been 10.1 °C in 2022 and 9.6 °C in 2023. The appearance of the first seedlings in 2022 was reported after 29 days for the extra-early sowing period and 19 days for the next term. The arising period in 2023 practically recorded similar values similar with insignificant differences from the previous year. In the first sowing period in 2022 samples with higher germination rate were found in the germplasm groups Iodent - 51.5% and Euroflint - 49.0 %. Average inbred lines BSSS-B37 constituted 35.0% and the 3 samples with Lancaster germplasm recorded an average of 35.8%. Relatively more favorable thermal regime for early sowing with a 15-day gap favored the process of sprouting grains and the average per experience constituted 78.1% compared to 41.9% in the ultra-early sowing. The average germination for inbred lines with indurata grain (Euroflint) reached maximum values of 83.2%, being practically equal to the germination faculty of the Lancaster group. At the level of 78% were situated samples with BSSS-B37 germplasm group, whereas the inbred lines from Iodent group showed a seedling germination of 70.9%. On average in both terms of sowing for the indurate inbred lines in 2022 - 66.1% seedlings arose, followed by the lines of the dented seed groups: Iodent - 61.2%, Lancaster - 59.6% and BSSS-B3 - 56.3%. The average of two years of evaluations in 2 periods of sowing the germination of inbred lines of the group Lancaster was 57.1%, followed by: Euroflint groups - 55.7%, BSSS-B37 - 53.6% and Iodent - 53.8%. From inbred lines with experimental data for 2 years 8 samples with high tolerance to low soil temperatures were identified, including the MKP55 commercial line with an average of 69.8% of viable grains.

Keywords: *early maize, germplasm groups, inbred lines, seed germination, sowing times.*

CZU: 633.63:632.51

CONVISO SMART TEHNOLOGY: WEED CONTROL IN THE SUGAR BEET OF THE FUTURE IS A NEW SOLUTION TO OLD PROBLEMS

Nicușor Valeri

Suedzucker Moldova, Republic of Moldova

E-mail: valeri.nicusor@gmail.com

The aim of our study was to investigate the new CONVISO®SMART technology for weed control in sugar beet.

Two factors were investigated: Yield potential of sugar beet hybrids of CONVISO®SMART technology; Effectiveness of CONVISO®SMART system in controlling weed population. The experimental plots were randomized, in 4 repetitions, in the period 2018-2022.

Results of variety testing. The first testing in 2018 of sugar beet hybrids of the new technology revealed that the initial lineup was low in genetic potential and averaged cca. 83.1% of the standard. The best of all new hybrids was SM Gioconda 5K 620, which achieved 101.7 % in terms of purified sugar yield per ha compared to the standard.

Herbicide testing results: the first test in 2020 of the CS systems for weed control performance compared to the classical protection system found that the CS system provided 4.44 tons of sugar harvest per 1 ha (100 %) compared to the classical system, which provided 4.26 tons of sugar harvest per 1 ha (95.9 %). Sugar harvest in the 1st control without protection was 1.88 tons/ha (42.5 %).

Finally: 1. The yield potential of sugar beet hybrids of CONVISO®SMART technology is at a high level and provides high indicators of purified sugar collection – 111.3-115.5 % in relation to the standard; 2. The efficiency of CONVISO®SMART system in controlling the number of weeds is sufficient to control the number of weeds, which allows to provide sugar collection at the level of the existing classical scheme of plant protection against weeds – 100 %, but in combination with other herbicides provides results - 115.1 %; 3. These results are implemented in production in the period 2018-2023 and the area of sugar beet crops in RM for 5 years has grown to 7-8000 ha (70 % of the total area), which clearly demonstrates the effectiveness of this technology.

Acknowledgments: This study was supported by the research project „CONVISO®SMART SZM & KWS SaaT SE”, funded by Suedzucker Moldova.

Keywords: CONVISO®SMART, sugar beets, sugar harvest, variety testing, weeds.

CZU: 633.11:631.526.32(498)

RESEARCH ON THE PRODUCTIVITY AND QUALITY OF SOME VARIETIES OF WHEAT IN THE PEDOCLIMATIC CONDITIONS OF THE EASTERN BOTOSANI COUNTY, ROMANIA

Puiu Ioan, Robu Teodor, Ghițau Carmen Simona, Lungoci Constantin, Haraga Lucian Constantin, Țopa Denis, Samuil Costel

University of Life Sciences „Ion Ionescu de la Brad”, Iasi, Romania

E-mail: ioan.puiu@uaiasi.com

The main purpose of the research was to test the productive and qualitative potential of 20 Romanian and foreign wheat varieties, from seven seed producers. The researches were carried out in the agricultural year 2021/2022, in the vegetable farm belonging to the company „Samis Urban” SRL, in Mihalaseni, Botosani county, in non-irrigated regime.

The applied technology was conventional, the distance between the rows was 25 cm, the sowing rate was 170 kg/ha seed (400 grains/square meter), the fertilization ensured an agrofund of 170 kg nitrogen/ha active substance (a.s.), 90 kg phosphorus/ha a.s. and 180 kg potassium/ha a.s.

The wheat crop was protected by the use of herbicides, fungicides and insecticides, according to the technological norms used in the farm. The highest production of wheat was recorded for the „Absalon” variety (Limagrain) being 6.189 kg/ha and „Complice” (Axereal) variety – 5.923 kg/ha.

Regarding the quality of wheat production, two varieties from the Fundulea Agricultural Research and Development Institute are on the first two places: „Voinic” with 14.3% protein and 36.9% wet gluten and „Pitar” with a protein content of 13.2 % and a percentage of 35.2% gluten.

Keywords: winter wheat, yield, quality, field crop.

**STUDIES REGARDING THE INFLUENCE OF RHIZOBACTERIA
BRADYRHIZOBIUM JAPONICUM AND SALICYLIC ACID ON
WATER, MINERAL NUTRITION OF SOYBEAN UNDER
INSUFFICIENCY OF PHOSPHORUS AND MOISTURE OF SOIL**

Rotaru Vladimir¹, Rîșnoveanu Luxița²

¹*Institute of Genetics, Physiology and Plant Protection, MSU,
Chisinau, Republic of Moldova*

²*Academy of Economic Studies of Bucharest, Agricultural Station
of Research and Development Braila, Romania*

E-mail: rotaruvlad@yahoo.com

Nowadays the farmers are largely cash limited and mineral fertilizers being costly, restricts their capacity to purchase fertilizers and hence it is needed to develop sustainable agricultural production especially under scarce water and nutrient environments. The low yields of legumes are partly due to infertility caused by carbonated soils which have low nutrient contents, particularly of available phosphates, insufficient water supply and compatible *Rhizobium* for adequate N₂ fixation. In conditions of the Republic of Moldova phosphorus (P) deficiency of soil and drought are major environmental constraints which alter key physiological constituents and functions in plants. Nitrogen-fixing microorganisms besides their ability to assimilate nitrogen from atmosphere have a contribution for promoting the growth and nutrition of crops.

A study was carried out to determine the influence of rhizobacteria *Bradyrhizobium japonicum* and salicylic acid (SA) on water, nutrients contents in soybean leaves under low P supply and drought conditions. The soil was represented by chernozem carbonated with low available phosphates. Soybean seeds (cultivar Horboveanca) were inoculated with suspension of rhizobacteria *Bradyrhizobium japonicum* (Rh) before sowing. Plants were treated with two regiments of irrigation water: 70% of water holding soil capacity (WHC) and 35% of WHC as drought. The salicylic acid was applied as foliage treatment at concentration 0.5 mM during vegetation period of soybean. Plant physiological parameters were determined after drought period.

It was concluded that inoculation of soybean plants with rhizobacteria *Bradyrhizobium japonicum* and foliage application of salicylic acid improved water status and mineral nutrition of soybean plants cultivated under insufficiency of phosphorus and moisture of soil conditions.

Keywords: *Bardryzobium japonicum*, *Glycine max. L*, drought, phosphorus, nutrients, water.

FIRST STEPS IN CLIMATE CHANGE ADAPTATION OF CORN TECHNOLOGY WITHIN CONSERVATION AGRICULTURE FRAMEWORK

Rurac Mihail¹, Spivacenco Anatolie², Meleca Anatolie², Criucicov Oleg²

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Institute of Crop Science „Porumbeni”, Pascani village,
Criuleni district, Republic of Moldova*

E-mail: mihail.rurac@am.utm.md

The Republic of Moldova is very severely affected by climate change due to its geographical position and intensity of soil degradation processes. The country is reducing GGE and implementing a sustainable soil management approach through a conservation agriculture farming system.

The efforts of the research team are aimed to comparing two farming systems: conventional and conservation farming systems in real field conditions having as scientific and methodological background FAO concept of Conservation Agriculture. The field experiment started in the summer of 2022 soon after winter wheat was harvested. Seven variants with different combinations of practices have been established. The witness is the variant based on conventional farming practices. The variants based on conservation farming practices include variants with and without cover crops, summer mixt and pure cover crops, and winter cover crops with early and late termination. Two programs of herbicide were used during 2022-2023 to terminate winter cover crops and weeds. Corn was seeded on 7 of May, 2023 in all variants of the field experiments. No synthetic fertilizer was used during the mentioned period. Climate and soil conditions were favorable during the research period with the exception of July- August of 2023 when Moldova was hit by unusually high temperatures of the air. The water content in the soil, the above-ground biomass accumulation, the phenological observation of growing stages, and plant density were investigated

The preliminary results obtained during investigation period are very promising. We obtained emergence of cover crops in all variants during September month of 2022. Favorable climate conditions including warm period and abundant precipitations contributed to huge biomass formation of cover crops in all variants. Available water content was higher on the plot covered with winter wheat residues without cover crops. The cover crops and its termination have a great influence on corn emergence and future development. Many challenges appeared during research that need to be address in order to have a clear picture.

Acknowledgments: This study was supported by the research project 20.80009.5107.15. „Comprehensive studies on the use of genetic resources in maize for the creation and implementation of competitive hybrids and the development of new technological elements in the context of climate change” funded by NARD of Republic of Moldova.

Keywords: *conservation agriculture, cover crop, crop rotation with corn, critical steps.*

STUDY OF AGROCHEMICAL ANALYSIS OF SOIL AND WATER ON PLANTATIONS OF SOME BLACKCURRANT VARIETIES IN THE CENTRAL PART OF THE REPUBLIC OF MOLDOVA

Sava Parascovia, Bulgac Natalia

*Public Institution Scientific-Practical Institute of Horticulture and Food
Technologies, Chisinau, Republic of Moldova*

E-mail: bulgacnatalia@gmail.com

The paper presents the results of the analyzes of the soil on the land intended for blackcurrant, as well as of the water used to irrigate the plants. The research was carried out on the experimental sector in Todiresti commune, Ungheni district. The study objects served the soil samples, taken from the depths of 0–20 cm and 20–40 cm, as well as water from a lake located 3 km from the experimental sector and water pumped from the Prut River. The type of soil intended for the plantation is ordinary chernozem. After the study, it was established that at a depth of 0 - 20 cm the humus has values of 3.23%, and at a depth of 20 - 40 cm it reaches 6.69%. The soil does not contain carbonates, having an alkaline reaction at a depth of 0-20 cm, pH = 8.63, and at a depth of 20-40 cm, pH = 9.35. The content of mobile phosphorus (0-20 cm - 8.08 mg/100g; 20-40 cm - 9.83 mg/100g) and mobile potassium (0-20 cm - 46.16 mg/100g; 20-40 cm - 40.87 mg/100g) from the soil is in sufficient quantities for plant development. As for nitric nitrogen, it is contained more in the upper layer (0-20 cm - 0.65 mg/100g) than in the lower one (20-40 cm - 0.20 mg/100g), an insufficient amount for plant development, thus requiring the annual application of approximately 30 kg/ha. The analysis of water samples from the nearby lake established that it has an alkaline reaction with pH = 9.35, and water with a maximum pH of 8.3 is recommended for irrigation. Dry residue is contained in water in amounts of 7.224 g/l, while less than 1.000 g/l is allowed. The amount of chlorine in the water reached values of 301.04 mg/l, while it must not exceed 250 mg/l. The rest of the water parameters in the lake are acceptable. The water pumped from the river Prut was found to be suitable for irrigation, because it has a pH = 7.0, the chlorine content is 35.5 mg/l, and there is no dry residue. Adjusting the balance in the usual chernozem soil, as a result of irrigating the plants with high-quality water pumped from the river Prut, supplementing the amount of macro-elements necessary for plant development, will make it possible to develop the blackcurrant plantation to obtain quality fruits.

Acknowledgments: This study was supported by the research project (State Program 20.80009.5107.22A „Development and upgrading of sustainable and environmentally friendly technologies for fruit and berry species under climate change conditions”), funded by (ANCD and MAIA).

Keywords: *blackcurrant plantation, depth, humus, soil analysis, soil acidity (pH), macronutrients, water analysis, water acidity (pH).*

INFLUENCE OF SOIL EROSION ON THE AGOCENOSIS HARVEST OF WINTER WHEAT

Bacean Ion

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ion.bacean@fa.utm.md

The researches were carried out during 2023, in Gordinești town, Edineți district, on deep loamy-clay leached chernozems and of different degrees of erosion in the agrocenosis in winter wheat.

Leached chernozems are characterized by the deep leaching of carbonates outside the soil profile, the existence of illuviation processes, which morphologically is reflected in the increased subsidence of the Bw horizon and the formation of the finely prismatic and nut-like structure. The soil profile is differentiated into horizons: A (humus-cumulative), Bw (iluvial-cambic), which, usually, according to settlement, structure and color, is subdivided into sub-horizons Bw1, Bw2. Visible carbonates in the form of threads and concretions appear in the Ck horizon, and weak effervescence with HCL is observed in the lower part of the Bw2 horizon or BCK horizon.

The reaction of the soils in the upper horizons is neutral (pH – 7.1 – 7.2), and with the appearance of carbonates in the lower horizons, it becomes weakly alkaline (pH – 7.5 – 8.1).

The investigated profiles differ established according to the thickness of A in the non-eroded and slightly eroded soils and according to the thickness of the humiferous horizon (with a content of more than 1% humus) in all the investigated soils. It was established that the highly eroded soils have a thickness of the humiferous horizon 3.5 times less compared to the non-eroded leached chernozem and 2.2 times less compared to the moderately eroded leached chernozem. Excessively eroded soils are characterized by an arable layer formed from the former BC horizon (very poorly humified parent rock with a humus content of 0.5-1%)

From the results of the conducted research, there is a differentiation of production according to the degree of erosion is noted. Along with the increase in the degree of erosion, the tendency to decrease the harvest of winter wheat is observed, and the higher the degree of erosion, the lower the harvest.

The productivity of highly eroded soil is characterized by the following reduced indices compared to the productivity of non-eroded chernozem regarding winter wheat. Plant height 1.3 – 1.9 times, total biological yield – 2 -2.4 times and grain yield – 1.9 – 2.7 times lower.

The research was carried out within the project: Approaches forecast growth quality of skills in agrarian higher education based on partnership with business environment, with cipher no. 20.80009.0807.41, contracting authority - National Agency for Research and Development.

Keywords: chernozems, erosion, winter wheat, harvest.

THE BIOMASS QUALITY OF *CRAMBE CORDIFOLIA*, AND ITS POTENTIAL APPLICATION

**Titei Victor¹, Cîrlig Natalia¹, Garștea Nina¹, Andreoiu Andreea², Guțu Ana¹,
Coșman Sergiu^{1,2}, Mardari Liliana¹, Cozari Serghei¹, Coșman Valentina^{1,2},
Ababii Alexei¹, Doroftei Veaceslav¹, Gadibadi Mihai¹, Covalciuc Dragoș¹**

¹„Al. Ciubotaru” National Botanical Garden (Institute), SUM,

Chisinau, Republic of Moldova

²Institute of Biotechnology in Animal Husbandry and Veterinary Medicine,
Maximovca, Anenii Noi, Republic of Moldova

E-mail: vic.titei@gmail.com

The objective of this research was to evaluate the biomass quality of introduced species *Crambe cordifolia* Steven, *Brassicaceae* family native to the Caucasus.

The *Crambe cordifolia* plant was collected the third year of vegetation in flowering stage, from experimental field of the NBGI, Chisinau, Moldova. The quality of the green mass has been determined by near infrared spectroscopy technique, using the PERTEN DA 7200 at the R&D Institute for Grasslands, Brașov, Romania. The nutritional value and energy supply of the feed and the biochemical methane potential of substrates were calculated according to standard procedures. The theoretical ethanol potential was calculated based of cellulose and hemicellulose content in dry stems after harvesting the seeds, and its conversion of hexose and pentose sugars.

Results revealed that dry matter of whole plant contained 161 g/kg CP, 304 g/kg CF, 100g/kg ash, 330g/kg ADF, 504 g/kg NDF, 54 g/kg ADL, 97 g/kg TSS, 276g/kg Cel, 174 g/kg HC with nutritive and energy value 63.2% DDM, RFV=117, 10.21 MJ/kg ME and 6.23 MJ/kg NEI.

We found that the fresh mass substrates for anaerobic digestion had C/N=20 and biochemical methane potential achieved 326 L/kg VS.

The collected dry stems contained 444g/kg cellulose, 233 g/kg hemicellulose and the theoretical ethanol potential from fermentable sugars averaged 492 L/t.

The *Crambe cordifolia* green mass can be used as alternative fodder for farm animals or as substrates for the production methane in biogas generators, the dry stems as feedstock for obtained bio ethanol for production renewable energy.

Acknowledgments: This study was supported by the research project nr. 20.80009.5107.02 „Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”; nr.20.80009.5107.12 „Strengthening the „food-animal-production” chain by using new feed resources, innovative sanitation methods and schemes” funded by National Agency for Research and Development.

Keywords: *biochemical composition, Crambe Cordifolia, dry stems, green mass, nutritive value, methane potential, theoretical ethanol potential.*

Subsection - 1.2. Genetics, breeding and plant biotechnologies

CZU: 631.117.4:633.2/.3.03(498)

MAIN RESULTS OF THE RESEARCH PROCESS CARRIED OUT AT THE RESEARCH AND DEVELOPMENT STATION FOR MEADOWS VASLUI, ROMANIA

**Acatrinei (Dumitru) Simona, Vacarciuc Elena-Manuela,
Gavrilă Cristian-Sorin, Stavarache Mihai**

Research and Development Station for Meadows, Vaslui, Romania

E-mail: scdp_vs@yahoo.com

The research conducted during the 1981-2023 period at the Meadows Research and Development Station, Vaslui (RDSM Vaslui) (46°40'-36°10' north latitude and 27°44'-20°40' east longitude) followed the breeding program of three species of perennial grasses and legumes of meadows: *Bromus inermis* Leyss., *Agropyron pectiniforme* Roem., & Schult., and *Onobrychis viciifolia* Scop., species with an important role in combating erosion and increasing the fertility of degraded soils.

The Research-Development Station for Meadows Vaslui was established in 1981 in order to answer the problems of pratology in the hilly area of North-Eastern Romania. It is organized as a public institution with legal personality and is subordinated to the Academy of Agricultural and Forestry Sciences „Gheorghe Ionescu – Sisesti” – Bucharest.

Species of grasses and perennial legumes for meadows are considered among the most important species in the vegetation of permanent grasslands and in the structure of agricultural crops sown in arable land, with a multifunctional role in the sustainable development of agriculture. In order to keep up with climate change, it is necessary to create new varieties of plants, activity depending on the geographical area, depending on the species and its field of use.

At the RDSM Vaslui have been created: 6 varieties of *Bromus inermis* Leyss. (Doina, Olga, Mihaela, Iulia Safir, Maia Safir and Dovas), with 12.74-14.66 % crude protein content, 10-20.3 Mg·ha⁻¹ dry matter production capacity and 550-1000 kg·ha⁻¹ seed production, 1 variety of *Agropyron pectiniforme* Roem. & Schult. (Flaviu) with 13.4 % crude protein content, 4-9 Mg·ha⁻¹ dry matter production capacity and 400 - 500 kg·ha⁻¹ seed production and 2 varieties of *Onobrychis viciifolia* Scop. (Anamaria and Sersil) with 19.53-20.7 % crude protein content, 9-18.1 Mg·ha⁻¹ dry matter production capacity and 1000-1400 kg·ha⁻¹ seed production.

Currently, within the RDSM Vaslui there is a continuous process of improvement of the three species, through the mass selection process. There are: 9 collection fields, 10 seed fields of the breeder, 6 selection fields, 5 fields of assortments and 2 fields of descendants and other fields and experiences.

Acknowledgments: This study was supported by the research project ADER 15.1.1 project (2023-2026), funded by Ministry of Agriculture and Rural Development - Romania.

Keywords: *Agropyron pectiniforme roem. & schult.*, *Bromus inermis Leyss.*, *Onobrychis viciifolia scop.*, varieties.

PROTEOBACTERIA WITH BIOTECHNOLOGICAL POTENTIAL IN TYPICAL CHERNOSIUM

Artiomov Laurentia

*Institute of Microbiology and Biotechnology of Technical University of Moldova,
Chisinau, Republic of Moldova*

E-mail: laurentia.artiomov@imb.utm.md

The aim of the research was to study by metagenomic methods the structure of the bacterial community of the phylum Proteobacteria and to identify some taxa with biotechnological potential.

The research was carried out in the long-term field experiment on the „Biotron” Experimental Station of the Academy of Sciences of Moldova in two crop rotations (with and without alfalfa). Characterization of the compositional diversity of the soil microbiome was achieved by sequencing amplicons targeting the 16s rDNA gene of prokaryotes (Scientific Center „Genomic Technologies, Proteomics and Cell Biology” of FSBSI ARRIAM, St. Petersburg, Russia).

The phylum Proteobacteria includes an enormous morphological, physiological and metabolic diversity; its representatives are of great importance for the global carbon, nitrogen and sulfur cycle. The microbial community of the chernozem of the „Biotron” Experimental Station was dominated by the phylum *Proteobacteria*, which had an abundance that varied between 14-34%. The lowest relative abundance was recorded in the soil of the forest strip, and the highest in the soil with mineral and organic fertilization. The dominant genera of *Proteobacteria* were *Sphingomonas*, *Microvirga*, *Skermanella*. The highest relative abundance (1.2-6.8%) was determined for the genus *Sphingomonas*. Species belonging to the genus *Sphingomonas* possess various functions. Many members of the *Sphingomonas* genera possess unique abilities in degrading refractory organic pollutants. Some of the species of the genus *Sphingomonas* improve plant growth under drought, salinity and heavy metal stress conditions in agricultural soils. This role has been attributed to their potential to produce plant growth hormones, for example, gibberellins and indole-3-acetic acid. The genera *Microvirga*, *Skermanella* are also of particular interest for agricultural biotechnologies as microorganisms capable of stimulating plant growth under abiotic stress conditions and degrading various soil pollutants.

Most *Sphingomonas* species possess the ability to degrade a variety of aromatic compounds and industrial pollutants, thus contributing significantly to environmental remediation and industrial production. Deep knowledge about the ecological distribution and diversity of bacteria of the genera *Sphingomonas*, *Microvirga*, *Skermanella* associated with plants can provide new insights to explore its agricultural potential for promoting plant growth.

Acknowledgments: This study was supported by the research project „Efficient use of soil resources and microbial diversity through the application of elements of organic farming”, 20.80009.5107, funded by the National Agency for Research and Development (NARD) of RM.

Keywords: *chernozem, soil pollutants degradation, plant growth promoting, proteobacteria.*

**COLLECTION OF SPICES AND AROMATIC PLANTS IGPPP OF
USM – COMPONENT PART OF AGRICULTURAL SCIENCES**

Chisnicean Lilia, Ivanțova Irina, Baranova Natalia

Institute of Genetics, Physiology and Plant Protection of USM,

Chisinau, Republic of Moldova

E-mail: chisniceanl56@gmail.com

The paper presents the results of the study of the collection of spice-aromatic plants at the IGPPP of Moldova State University, based on morphological, morphometric and phenological characteristics. Data on plant productivity in the technological ripening phase, seed productivity and the main quality indicators are presented below. The collection of spice-aromatic plants is currently represented by 153 species belonging to 32 families. Among the studied species, in the collections, there are perennials (83%), biennials (5%) and annuals (12%). In the collections, there are introduced taxa with unique features. Among the first valuable species introduced into the collection, there is *Stevia rebaudiana* Bertoni – which contains diterpene glycosides with zero-calorie sugar substitute properties, two cultivars being created and patented – Dulcinela 1 and Dulcinela 2. The given cultivars have high productivity of over 2t/ha of pharmaceutical herba, which can be used in drinks and dishes or processed into stevioside. Two other spice-aromatic species studied by us were *Cymbopogon flexuosus* Staph. and *Aloysia triphylla* L’Her., with a pleasant citrus-like aroma, which have been adapted to local soil and weather conditions and therefore can be easily propagated and grown in open field. They are recommended as important ingredients in the preparation of teas and as food additives to various dishes and drinks. We have also studied two genotypes of *Potentilla alba* L., which is a promising species, currently very popular on the pharmaceutical market and which cannot be found in the spontaneous flora of the Republic of Moldova, being effective in preventing and treating hypothyroidism, hyperthyroidism, nodular formations, diffuse tissue changes, conditions of the cardiovascular system and the gastrointestinal tract. *Scutellaria baicalensis* Georgi is another valuable species with anti-inflammatory, antiviral, antibacterial, neuroprotective, immunostimulating, antioxidant, dermo-protective, anxiolytic, antiasthmatic, antiallergic properties. Based on the studied material, new cultivars of spice-aromatic plants were created: (*Ocimum basilicum* L.) - Opal-mini, Crețișor-2014, Picant de grădină-2022, (*Lavandula angustifolia* Mill.) - Lavinie de grădină-2014, (*Physalis ixocarpa* L.) – Agat-GB-2014, (*Thymus x citriodora* Pers. Schreb.) – Lily roz-2022, which have been registered in the Register of Varieties of the Republic of Moldova. Three introduced species, which are now among the most popular aromatic spice plants, are undergoing comparative testing. Among them, there are *Nigella Damascena* L. and *Sesamum indicum* L., from which fatty oil is extracted for culinary use and for its special medicinal properties, being also used in cosmetology. *Cassia occidentalis* (L.)

Keywords: aromatic, collection, family, species, spicy, varieties.

METHODOLOGY FOR CREATING ELECTROPHORETIC PASSPORTS OF MAIZE HYBRIDS AND THEIR PARENTAL FORMS AT THE LEVEL OF PROTEIN MOLECULES

**Batiru Grigorii, Comarova Galina, Adamciuc Arcadi,
Rotari Eugen, Bounegru Serghei, Cojocari Dumitru**

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: grigorii.batiru@am.utm.md

One of the topical problems of seed production in the Republic of Moldova is the timely export of hybrid corn seeds and their quality assurance, especially varietal purity (% hybridity). The main goal of the work is to systematize the main stages of preparation and modeling of the electrophoretic passports of the reserve protein from the grain (zein) in the native corn hybrids in order to simplify the interpretation and efficiency of their use both for applied commercial purposes and in the research process.

The 65 maize hybrids and 108 maize parental lines were used as material for research according to hybrid categories and production use. Electrophoretic passporting was performed for 37 simple hybrids, 2 modified simple hybrids, 23 three-way hybrids, 2 double hybrids and one multilineal hybrid.

The initial electrophoretic spectra of zein for the parental lines of the selected hybrids were obtained by the electrophoresis method on polyacrylamide gels in acidic medium according to the national standard SM 233:2003. The obtained data were processed in the „FOREZ-2” program.

Thus, as a result, the criteria, principles and methods for creating and interpreting electrophoretic passports at the level of protein molecules were elaborated, selected and systematized: (1) The initial sample preparation procedure for the electrophoretic passporting of the analyzed maize hybrids was adapted and their parental lines for the beneficiaries-originators of hybrids homologated for the purpose of protecting copyright; (2) A new version of the FOREZ-2 computer program was created; (3) An algorithm for creating electrophoretic passports in digital format was developed and tested in practice; (4) Models of EF passports were developed for which the presentation of the results of computerized processing on 7 parameters was programmed, allowing to increase the accuracy and expand the possibility to express the objective evaluation of the varietal purity of the hybrid maize certified seed lots.

Acknowledgments: This study was supported by the research project no. 20.80009.5107.21 within the State Program for the years 2020-2023, financed by the National Agency for Research and Development.

Keywords: *maize, hybrids, electrophoretic passports, FOREZ-2 program, protein electrophoresis.*

**MODERN PRINCIPLES OF AGRICULTURAL EDUCATION
ABROAD AS THE BASIS FOR IMPROVING AGRICULTURAL
HIGHER EDUCATION IN THE REPUBLIC OF MOLDOVA**

Comarova Galina

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: galina.comarova@am.utm.md

At the global level, for the first quarter of the 21st century, the modern higher agricultural education (HAE) is determined on three main components: education, scientific research (SR) and long-term development. The main feature of the abroad HAE is that the leading agricultural Universities in many countries of Europe and America today train specialists of a wide profile, going beyond just agricultural production. Abroad HAE has currently begun to focus on representatives of different segments of the population, people of different ages, with different levels of basic knowledge. On 2022 the HAE reform, carried out in the Republic of Moldova, was the first step towards finding progressive forms of training for a new generation of specialists who are able to independently apply the acquired knowledge in practice to manage modern high-tech agribusiness. To resolve successfully this problem, it is very important to do a comparative analysis of HAE systems in the USA, and in the wide range of Western European countries, among which, undoubtedly, countries such as Germany and France are of particular interest. This abstract summarizes the results of this analysis. In the USA, the main goals of agricultural educational institutions became a fundamental part of the State Laws. This goals, which determined the direction of the country's agricultural policy, are the following: a) increasing the level of rural population education; c) the right to work during training; c) direction of SR to resolve pressing farming problems; d) introduction of agricultural SR into the creation and development of rural social infrastructure. In Germany, one of the main principles of the HAE is the principle of academic freedom. Its peculiarity is that each student independently determines the list of their disciplines that will be included in their diploma - for in-depth study and conduct of scientific research. Accordingly, without sufficiently developed practical knowledge it is impossible to obtain a diploma of a qualified agricultural specialist in Germany. France HAE is characterized by flexibility and variability in the structure of agricultural education. All agriculture SR is carried out in France classical agronomic institutes, which have the right to create training centers independently. Equal rights in education have been legalized for both students - of the France and foreigners. Thus, a brief comparative analysis of the features of abroad HAE indicates the large opportunities for using foreign experience to improve the structure and introduce new methods and education specific technologies of Moldova Republic HAE.

Keywords: higher agricultural education (HAE); Moldova, USA, Germany, France.

PLANTS WITH POSSIBLE ACTION ON ALZHEIMER DISEASE: PHYTOCHEMICAL AND BIOLOGICAL STUDIES

**Ionescu Alexandra-Mariana¹, Botezatu Andreea-Viorica¹, Busuioc Anna¹,
Iancu Alina-Viorica², Furdui Bianca¹, Dinică Rodica Mihaela¹**

¹„Dăunărea de Jos” University, Faculty of Science and Environment,
Galati, Romania

²„Dăunărea de Jos” University, Faculty of Medicine and Pharmacy, Galati, Romania

E-mail: alexaione96@yahoo.com

Alzheimer's disease (AD) is a neurodegenerative disorder and represents the most common type of dementia among elderly people. Thus far, oxidative stress, acetylcholine (ACh) low levels, the imbalance of metals metabolism and also the deposits of β -amyloid ($A\beta$) have been considered to play an important role in AD pathogenesis.

Synaptic dysfunction, tau protein hyperphosphorylation and aggregation, neuroinflammation, and oxidative stress would then follow, leading eventually to neuronal death and neurotransmitter deficits. The first and so far, sole marketed anti-Alzheimer drugs are the AChE inhibitors (donepezil, rivastigmine, and galantamine), which increase the ACh levels; these drugs, however, are effective only for symptomatic treatment of AD, since they are not able to prevent the progression of the disease. In the past years, there has been intense research activity for developing drugs able to inhibit $A\beta$ formation or aggregation.

Therefore, therapies with combination of drugs or the development of multitarget anti-Alzheimer drugs has become a primary objective. Our research focuses on this type of molecular recombination based on plant extracts with antioxidant, anticoagulant and antimicrobial potential. In this work we have evaluated four medicinal plants in the mixture from the point of view of antioxidant, antimicrobial and anticoagulant properties in order to study them later as possible alternatives in Alzheimer's disease.

Acknowledgments: This work was partially supported by ADER grant 5.2.1. - Conservation and valorization of the genetic heritage of aromatic and medicinal species that can be cultivated on the territory of Romania.

Keywords: *alzheimer disease, antimicrobial activity, anticoagulant effect, polyphenol compounds.*

EVALUATING SOYBEAN GENOTYPES BASED ON PROTEIN CONTENT, OIL CONTENT, AND TRYPSIN INHIBITOR ACTIVITY

Malii Aliona¹, Budac Alexandru¹, Harciuc Oleg¹, Rudacova Angela²

*¹Institute of Genetics, Physiology and Plant Protection of SUM,
Chisinau, Republic of Moldova*

*²Institute of Genetics, Physiology and Plant Protection of SUM, Scientific Research
Laboratory „Biochemistry of Plants” Chisinau, Republic of Moldova*

E-mail: malii.aliona@mail.ru

The primary objective of this study was to investigate the nutritional composition of five distinct soybean genotypes (Genap 54, L.2 (S-4 x Nadejda), Onika, Z1M₉250, and Z3M₁₀200) and assess their impact on protein digestibility. The study yielded several noteworthy conclusions:

Protein Content: The soybean genotypes under analysis exhibited significant variations in their protein content. Genotype Z3M₁₀200 stood out with the highest protein content at 49.6%, while Genap 54 had the lowest protein content at a mere 38.5%. This substantial disparity in protein content highlights the pivotal role of genotype selection in influencing dietary protein intake and the overall nutritional value of soy-based food products.

Oil Content: The oil content in these soybean genotypes showed relatively consistent values, ranging between 23.7% and 25.0%, with the exception of the L.2 (S-4 x Nadejda) genotype, which displayed the lowest oil content. This uniformity in lipid content across different genotypes indicates that soybean oil production can be facilitated by choosing any of these genotypes, as it offers predictability in the oil extraction process.

Trypsin Inhibitor Activity (TIA): The study revealed significant differences in TIA levels among the soybean genotypes. Genotypes Z1M₉250 and Z3M₁₀200 exhibited the highest TIA values, indicating a greater capacity to inhibit trypsin in these genotypes. In contrast, Genap 54 displayed the lowest TIA level. These findings are of utmost importance as increased TIA levels can negatively impact protein digestibility and nutrient absorption, potentially affecting the nutritional quality of soy-based products.

This study highlights significant differences in the nutritional profiles of different soybean genotypes, especially in terms of protein, fats, and trypsin inhibitor activity. This information is valuable for choosing the right soybean genotypes for specific uses, whether in food production or animal feed, based on their nutritional suitability.

Acknowledgments: The research was carried out within the project of the State Program 20.80009.7007.04 „Biotechnologies and Genetic Methods for the Detection, Conservation, and Utilization of Agrobiodiversity”, funded by the National Research and Development Agency.

Keywords: *genotypes, oil, protein, soybean, trypsin inhibitor activity.*

**MORPHOLOGICAL STUDY OF *ECHINACEA PURPUREA* (L.)
SPECIES BACK IN CULTURE AT THE AGROBIOLOGICAL
STATION OF THE STATE UNIVERSITY OF MOLDOVA**

**Melnic Victor¹, Bîrsan Anna¹, Chirița Elena¹, Buracinschii Natalia¹,
Melnic Angela¹, Ponpuș Irina², Melnic Cristin¹**

¹L.C.S. „Plant Biochemistry” of SUM, Chisinau, Republic of Moldova

²Center for Cultivation of Medicinal Plants USMF „Nicolae Testemitanu”,
Chisinau, Republic of Moldova

E-mail: melnicvictor088@gmail.com

In this paper are the results of studying of the morphological structure of *Echinacea purpurea* species cultivated for two years in indigenous bioecological conditions. In this period of time was analyzed biomass accumulation of different plant parts in different stages of vegetation. The results showed that the dynamics of biomass accumulation in all three parts of the plant has increased capacity as well as the number of flowering shoots, both in the first year of cultivation and in year two. This proves about an increased adaptability to indigenous bioecological condition.

The morphological study of *Echinacea purpurea* L. plants grown under bioecological conditions of the agrobological station of the State University of Moldova: highlighting the morphological structures of *Echinacea purpurea* plants grown in bioecological conditions in the first year of vegetation; highlighting the morphological structure of *Echinacea purpurea* plants grown in bioecological conditions in the second year of vegetation; the biological observations during the ontogeny period were carried out according to the classical methods specific to perennial plants with a bushy aspect proposed by which provides for *E. purpurea* 3 variants of the realization of the ontogenetic program: the virginal stage, the juvenile and immature stage, the generative period.

Echinacea purpurea plants, later obtained from seeds, were used as the object of research, being sown in the spring period of May in the open field in rows with a distance of 70 cm between rows and 30 cm in a row.

Echinacea purpurea cultures grown under native ecobiological conditions for two years have a 70/100 germination percentage of seeds sown in the open field in spring time and a morphological structure: the number of leaves 168.3 ± 28.5 , the number of shoots per plant 14, inflorescences in number 20, the height of the plants 120 cm, the average mass of a plant 678 g, which denotes an increased adaptability.

Acknowledgments: This study was supported by the research project 20.80009.8007.24, entitled „Biological and photochemical study of medicinal plants with antioxidant, antimicrobial and hepatoprotective action”, funded by (National Agency for Research and Development (ANCD)).

Keywords: *adaptability, biomass, bioecological, germination, morphological structure.*

THE EVALUATION OF EARLY MAIZE HYBRIDS PARENTAL FORMS FROM ALTERNATIVE HETEROTIC GROUPS

Musteața Simion, Borozan Pantelimon, Spînu Alexei, Spînu Valentina

*Institute of Crop Science „Porumbeni”, Pascani village, Criuleni district,
Republic of Moldova*

E-mail: pantelimon.borozan@yahoo.com

The process of creating corn hybrids includes the stages of systematization of lines inbred in germplasm groups, evaluation of parental forms, identification of the best performing pairs of germplasm groups with highly adaptive and reproductive heterosis in heterotic hybridization formulas. In this study 468 hybrids were included in 2021, 578 hybrids in 2022 from the first test stage for the agronomic value of them and their parental forms, represented by inbred lines and inter-related crosses $A \times A_1$. Inbred lines, selected after combination capacity, are classified in the Euroflint germplasm groups, Iodent, BSSS-B37 and Lancaster based on pedigree and genetic diversity in identification crosses. The assessments were made in comparative orientation testings according to the following indices: growth rate in the phase of 5-7 leaves, phenophases duration from the rising of the seedlings to the flowering of the panicles, the appearance of stigmas and physiological maturity, plant size, productive cob insertion, the share of plants attacked by common embers and loaves, the share of broken and fallen plants, grain production, yield and humidity. Experimental data confirmed the superiority of $A \times A_1$ related crosses as maternal forms regarding the production of grains, which contributes to the efficiency of the production of certified hybrid seeds. In 2021, very favorable for corn cultivation, their average was 6,70 t/ha grains compared to 5.80 t/ha at inbred lines. A clearer differentiation was registered in 2022 with unfavorable climatic conditions, which significantly affected grain production, with average values of 2.79 t/ha at related crosses and 1.17 t/ha for the inbred line set. We mention that the change in the maternal form contributes significantly to the mass of 1000 grains and the share of the fractions 2 and 3 of commercial seeds requested as a matter of priority by buyers. Both groups of germplasm are used as paternal forms of early hybrids. Inbred lines from Iodent germplasm have a higher adaptability under stressful conditions, achieving productions of 4.70 t/ha. BSSS-B37 germplasm group inbred lines offer possibilities of their use both as paternal forms and as related crosses $A \times A_1$.

Keywords: *germplasm groups, hybrids, heterotic patterns, Inbred lines, parental forms.*

CZU: 633.16:631.811.98

INFLUENCE OF GROWTH REGULATORS OF STEROID NATURE ON PRODUCTIVITY AND QUALITY OF WINTER BARLEY GRAIN

Secrieru Silvia, Derendovskaia Antonina

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: silvia.secrieru@am.utm.md

Studies on the study of the action of steroid glycosides on plants of winter barley varieties Buran and Osnova, carried out in a field crop rotation saturated with leguminous crops - peas (early harvesting) and soybeans (late harvesting). Winter barley plants were sprayed once in the ripening phase - the beginning of the emergence into the tube with solutions of steroid glycoside preparations Moldstim (MS) and Ecostim (EC) in a dose of 25 mg/l, in the control versions - with water. Plot area – 2 m². Repeat the experiment 4 times. Solution consumption - 100 ml per 1 m² of leaf surface. In the process of research, the elements of productivity and potential productivity were determined; grain quality, protein, starch, fat, fiber and ash content - by infrared spectroscopy on Scanner model 4250 at IF „Porumbeni”. It has been established that the treatment of plants with Moldstim and Ecostim preparations leads to an increase in stem growth parameters, leaf surface area and time of its functioning during ontogenesis, accumulation of raw and abs dry biomass by 1.1-2.1 times compared to the control, regardless of variety features. In an average of three years, under the action of growth regulators in the studied varieties Buran and Osnova, when grown on peas, the mass of the ear increases by 1.1-1.3 times, the mass of the grain in the ear - by 1.1-1.4 times. To a lesser degree, these indicators increase when growing soybean varieties. The increase in grain size under the action of steroid glycosides occurs in a different degree. The number of grains in the spike especially increases in the Buran variety when the MS preparation is in effect.

Calculations of winter barley varieties Buran and Osnova, in real soil and climatic conditions, allowed to establish its dependence on the type of predecessor. It has been established that when growing pea varieties, compared to soybeans, the yield increases 1.4-1.5 times in the control variants.

Spraying of vegetating plants with MS and ES preparations leads to the increase in yield of varieties. Thus, in the Buran pea variety in the MS and EC variants, compared to the control, the grain productivity increases by 10.1-17.5q/ha. It should be noted that when growing on soybeans, compared to peas, the reaction of the Buran variety to the treatment with steroid glycoside preparations is more pronounced. Productivity increases by 1.5 times. In the Osnova variety, regardless of the type of predecessor, spraying vegetative plants with steroid glycoside preparations leads to a 1.3-fold increase in yield. Under the action of MC and ES preparations, an increase in the grain content of protein by 1.34-1.74%, fat by 0.24-0.59% and starch by 1.35-1.93% is observed in Buran pea plants.

Keywords: *barley varieties, Ecostim, Moldstim, peas, soybeans.*

PHOTOSYNTHETIC ACTIVITY OF APRICOT VARIETIES CULTIVATED IN THE SOUTHERN ZONE OF THE REPUBLIC OF MOLDOVA

Secrieru Silvia

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: silvia.secrieru@am.utm.md

Research on the growth parameters and photosynthetic activity of apricot plants was carried out in the agroclimatic conditions of the South of the Republic of Moldova, Vulcanesti district, in the farm SRL „Timac-Agro EAFT” on the varieties: *Kyoto, Falaria, Pin Cot, Spring Blush, Orange Red, Farbaly, Parle Cot, Sweet Cot, Wander Cot, Magic Cot, Lili Cot, Big Red*. Determine the indices of photosynthetic activity – the content of assimilatory pigments *cl.a*, *cl.b*, the sum of *cl.a+b* and carotenoids, mg/g.abs.dry subs.; chlorophyll indices (*cl.a/cl.b*), pigment indices (*cl.a+b/carotenoids*) and chlorophyll content (*cl.a+b*), mg/leaf. The studies were carried out in two periods: the deposition of the generative organs and their differentiation. During the period of deposition of the generative organs, an essential change in the thickness of the leaf limb is observed in the varieties studied, especially in the varieties *Spring Blush, Orange Red, Lili Cot* and *Big Red*. The surface of the leaf limb, varies in the parameters 37.53...67.59 cm²/leaf, increases in the varieties *Kyoto, Spring Blush, Orange Red, Wander Cot, Lili Cot* and decreases in the varieties *Falaria* and *Pin Cot*. We can mention that in the *Kyoto* and *Big Red* varieties, a more active growth of the leaf surface is evident during the period of differentiation of the generative organs. In the process of photosynthesis in the leaves, the accumulation of raw and absolutely dry biomass occurs, the parameters of which change from 0.23 (*Big Red*) to 0.53 (*Lili Cot*) g/abs. dry subst. per leaf. Photosynthetic pigments represent some of the most important internal factors that, in certain cases, can limit the photosynthetic rate. In apricot plants, a legitimacy is observed in the high content of *cl.a* compared to *cl.b*. During the period of deposition of the generative organs, the content of *cl.a* changes depending on the particularities of the variety from 2.225 (*Orange Red*) to 3.062 (*Parle Cot*) mg/g. abs.dry subst. At the same time, the level of *cl.b* changes from 0.542 (*Magic Cot*) to 0.901 (*Pin Cot*). The chlorophyll index (*cl.a/cl.b*) in most evenings is in the range of 3.4-4.5/1. The varieties studied are characterized by a high level of carotenoids whose content in the first period of determination changes from 1.038 (*Big Red*) to 1.501 (*Pin Cot*). The pigment index (*cl.a+b/carotenoids*) changes in parameters 2.6-2.9/1.

Acknowledgments: This study was supported by the National Agency for Research and Development of the Republic of Moldova, project 20.80009.5107.04 „Adaptation of sustainable and ecological technologies for fruit production in quantitative and qualitative aspects according to the integrity of the culture system and climate change”. Project director, Doctor Habil., university professor, Valerian BALAN.

Keywords: *Apricot, chlorophyll a, chlorophyll b carotenoids, growth parameters, biomass.*

THE QUALITY OF GREEN MASS AND HAY FROM ROMANIAN CULTIVARS OF *FESTUCA ARUNDINACEA*, *FESTUCA PRATENSIS* AND *FESTUCA RUBRA* IN THE REPUBLIC OF MOLDOVA

Tîtei Victor¹, Blaj Vasile², Vintilă Teodor³, Andreoiu Andreea², Marușca Teodor², Garștea Nina¹, Ababii Alexei¹ Mardari Liliana¹, Cozari Serghei¹, Doroftei Veaceaslav¹, Gadibadi Mihai¹, Covalciuc Dragoș¹, Mazare Veaceaslav³

¹„Al. Ciobotaru” National Botanical Garden (Institute), SUM,

Chisinau, Republic of Moldova

²Research and Development Institute for Grasslands, Brasov, Romania

³„Regele Mihai I” University of Life Sciences, Timisoara, Romania

E-mail: vic.titei@gmail.com

The species of the genus *Festuca* L., Poaceae family are common in the floristic composition of permanent and temporary grasslands. In the Official Catalog of the varieties of crop plants in Romania are registered 16 fescue cultivars, but in the Republic of Moldova there are no registered fescue cultivars.

The aim of this study was to evaluate the quality of harvested green mass and prepared hay from Romanian cultivars of of *Festuca* species created in Research-Development Institute for Grassland Brasov: 'Brio' and 'Măgurele' of tall fescue *Festuca arundinacea*, 'Tâmpa' and 'Transilvan' of meadow fescue *Festuca pratensis*, 'Căprioara' and 'Peisaj' of red fescue *Festuca rubra*, grown in monoculture an experimental field of the NBGI, Chișinău, Moldova. The quality of the green mass and hay have been determined by near infrared spectroscopy technique, using the PERTEN DA 7200 at the R&D Institute for Grasslands, Brașov, Romania. The nutritional value and energy supply of the feed and the biochemical methane potential of substrates were calculated according to standard procedures.

It was determined that the dry matter nutrient content of the harvested mass varied among the species and cultivars: 71-119 g/kg CP, 359-400 g/kg CF, 73-98 g/kg ash, 388-413g/kg ADF, 666-695 g/kg NDF, 30-45 g/kg ADL, 77-174 g/kg TSS, 355- 368 g/kg Cel, 272-307 g/kg HC with nutritive and energy values 56.3-58.9% DDM, 11.28-11.64 MJ/kg DE, 9.26-9.9.56 MJ/kg ME and 5.29-5.57 MJ/kg NEL. The hay prepared from *Festuca* species contained 61-95 g/kg CP, 364-459 g/kg CF, 74-94 g/kg ash, 391-479 g/kg ADF, 681-790 g/kg NDF, 32-56 g/kg ADL, 359- 428 g/kg Cel, 290-318 g/kg HC, 8-153 g/kg TSS with 51.6-58.4% DDM, 8.45-9.51 MJ/kg ME and 4.47-5.54 MJ/kg NEL. The estimated biochemical methane potential of the studied fescue green substrates varied from 328 to355 l/kg VS.

Acknowledgments: This study was supported by the research project nr. 20.80009.5107.02 „Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”, funded by National Agency for Research and Development.

Keywords: *biochemical composition, biomethane, cultivar, green mass, hay, Festuca arundinacea, Festuca pratensis, Festuca rubra, nutritional value.*

**THE QUALITY INDICES OF THE BIOMASS
FROM AVENA SATIVA CV. 'SORIN' GROWN UNDER THE
CONDITIONS OF THE REPUBLIC OF MOLDOVA**

**Titei Victor¹, Horablaga Nicolae Marinel^{2,4}, Garștea Nina¹, Coșman Sergiu^{1,3},
Horablaga Adina⁴, Mardari Liliana¹, Cozari Serghei¹, Coșman Valentina^{1,3},
Cojocariu Luminița⁴, Mazare Veaceaslav⁴, Armaș Andrei⁴, Ababii Alexei¹**

¹„Al. Ciobotaru” National Botanical Garden (Institute), SUM,

Chisinau, Republic of Moldova

²Agricultural Research and Development Station Lovrin, Timisoara, Romania

³Institute of Biotechnology in Animal Husbandry and Veterinary Medicine,
Maximovca, Anenii Noi, Republic of Moldova

⁴„Regele Mihai I” University of Life Sciences, Timisoara, Romania

E-mail: vic.titei@gmail.com

Currently *Poaceae* species are the most commonly used herbaceous plants as food, feed and bedding for animals, raw material for biorefinery to produce fuels, power, heat, and value-added chemicals.

The goal of this research was to evaluate the quality indices of the green mass, ensiled mass and hay from common oat *Avena sativa* as fodder for animals, as well as feedstock for the production of biomethane for renewable energy.

The cultivar of common oat *Avena sativa* 'Sorin' created at the Agricultural Research and Development Station Lovrin and cultivated experimental field of the NBGI, Chisinau, served as subject of the research. The quality indices have been determined by near infrared spectroscopy technique, nutritional value and energy supply of the feeds and the biochemical methane potential of substrates were calculated according to standard procedures.

The results revealed that the dry matter of whole oat plants contained 9.5% CP with forage value 598-603 g/kg DDM, RFV= 89, 11.84MJ/kg DE, 9.72-MJ/kg ME and 5.37MJ/kg NEL; prepared hay 10.5% CP, 574 g/kg DDM, 11.40 MJ/kg DE, 9.36 MJ/kg ME and 5.39 MJ/kg NEL. The ensiled forage (haylage) is characterized by pH = 3.77, 38.1g/kg lactic acid, 5.9g/kg acetic acid, 10.2% CP, 567-619 g/kg DDM, 11.28MJ/kg DE, 9.26MJ/kg ME and 5.29-MJ/kg NEL. The biochemical methane potential of the studied substrates from *Avena sativa* reaches 329-355 l/kg VS.

Acknowledgments: This study was supported by the research project nr. 20.80009.5107.02 „Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy” and nr. 20.80009.5107.12 „Strengthening the food-animal-production” chain by using new feed resources, innovative sanitation methods and schemes”, funded by National Agency for Research and Development.

Keywords: *Avena Sativa*, biochemical composition, biomethane, ensiled forage, fodder value, green mass, hay, nutritional value.

Subsection - 1.3. Agroecology

CZU: 633.854.78:581.5(478)

FAVORABLE AREAS FOR SUNFLOWER PRODUCTION IN THE REPUBLIC OF MOLDOVA

Domenco Rodion, Clapco Steliana, Duca Maria

Center of Functional Genetics, SUM, Chisinau, Republic of Moldova

E-mail: rodion.domenco@usm.md

The conservation and integrated management of agricultural areas affected by climate change is a current priority at the level of concerns regarding the implementation of the principles of sustainable agriculture. Climate change is characterized by higher temperatures and reduced amounts of water available for agriculture.

Sunflower, often grown in the southern and eastern regions of Europe, is vulnerable to the direct effect of heat stress and drought during its development cycle, both factors leading to severe yield losses. On the territory of the Republic of Moldova, besides sown areas and used agricultural technologies, the climatic factors also play an important role in harvest obtaining. According to the Fourth National Communication of the Republic of Moldova under the United Nations Framework Convention on Climate Change „*without adaptation measures due to changes in climatic conditions in the most districts of the RM, by the end of the XXI century, the cultivation of sunflower will be impossible or economically not cost effective according to the RCP 8.5 high emission scenario*”.

In this study the degree of favorability of the country's territory, depending on the distribution of air temperature and precipitation was analyzed. For this purpose, the statistical analysis of the data regarding sunflower yield for the period of 2003-2021 and its correlation with precipitation and temperature during the same period was carried out using XLSTAT - Excel module. Land favorability modeling for sunflower cultivation was carried out using QGIS - open source software, with complex possibilities for analysis and presentation of the results.

Based on the correlation coefficients between the average yield and the temperature values in April-August, the precipitation in the cold season, as well as those during the growing period in 2003-2021, it was established that conditions in the north of the country are more favorable for sunflower crop than in the southern half. Using the GIS technology maps of the degree of favorability of the territory of the Republic of Moldova for sunflower cultivation, which can be used in order to diminish the negative effects of climate change in the agricultural sector, were obtained.

Acknowledgments: this study was supported by the State Program 20.80009.5107.01 - „Genetico-molecular and biotechnological studies of the sunflower in the context of sustainable management of agricultural ecosystems”, funded by National Agency for Research and Development.

Keywords: *correlations, harvest, precipitation, favorable areas, temperature, sunflower.*

CZU: 633.854.78:631.559:581.5(478)

AREAS FOR MAXIMUM YIELD FORMATION IN SUNFLOWER ON THE TERRITORY OF THE REPUBLIC OF MOLDOVA

Domenco Rodion, Clapco Steliana, Duca Maria

Center of Functional Genetics, SUM, Chisinau, Republic of Moldova

E-mail: rodion.domenco@usm.md

Similar as entire agricultural sector, sunflower crop is significantly affected by climate change. On the territory of the Republic of Moldova, besides sown areas and used agricultural technologies, the climatic factors also play an important role in harvest obtaining. In this study the degree of favorability of the country's territory for sunflower cultivation, depending on the distribution of air temperature and precipitation was analyzed. Based on the coefficients of correlation between the average yield and the temperature values in April-August, the precipitation in the cold season, as well as those during the growing period in 2003-2021, it was established that conditions in the north of the country are more favorable for sunflower crop than in the southern half.

From the point of view of the amounts of temperatures above the biological threshold ($+7^{\circ}\text{C}$), but also of the temperatures in April-August, analyzed as an average for 2003-2021, in most of the territory of the Republic of Moldova the conditions are favorable for sunflower cultivation. It was found that in some years (2004, 2005, 2006) when values below 18°C are recorded, especially in the northern extremities (Briceni, Ocnita, Edinet, Donduseni, Soroca), the value of sunflower production is lower than in years with temperatures above this threshold.

Rainfall in the cold semester of the year, although insufficient throughout the country, registers higher deficits in the northern half, but the higher amounts of rainfall, which fall during the growing season, in this region, sometimes compensate for this deficit.

In the center of the country, rainfall during the growing season and average temperatures in April-August are optimal. However, the high degree of fragmentation of the relief in this region imposes certain restrictions on the areas occupied by arable land. Thus, the smaller harvest in Calarasi district can be explained. Even if the Cahul Plain and the Ialpuj Depression, from a thermal point of view, correspond to the optimal necessary for sunflower cultivation, the pluviometric deficit at the level of the cold period of the year and vegetation determines restrictive conditions, this area being assigned – according to the proposed calculation methodology – the „less favorable” criterion.

Acknowledgments: This study was supported by the national research project 20.80009.5107.01 „Genetico-molecular and biotechnological studies of the sunflower in the context of sustainable management of agricultural ecosystems”, funded by the National Agency for Research and Development, Republic of Moldova.

Keywords: *correlations, yield, favorable areas, precipitation, sunflower, temperature.*

OPTIMIZATION OF PARAMETERS FOR CREATING LIQUID FERTILIZERS USING THE WASTE FROM POULTRY FARM SRL „PILICCIK-GRUP”

Sucman Natalia¹, Gaidarji Feodor², Calinicenco Serghei³

¹*Institute of Chemistry, SUM, Chisinau, Republic of Moldova*

²*SRL „Piliccik Grup”, Comrat, Republic of Moldova*

³*Technical university of Moldova, Chisinau, Republic of Moldova*

E-mail: natalia_sucman@yahoo.com

The study presents research results focused on identifying optimal conditions for producing high-quality liquid fertilizers using resources from the poultry farm. LLC „Pilichik-Group”. To achieve this, avian manure accumulated at the enterprise and the products obtained from it, namely compost and biohumus, were used as the base material, prepared according to the methods described previously. They were subjected to extraction under varying temperatures and time conditions.

The content of both macro- and microelements was analyzed in all samples. pH was determined according to the SR 7184-13:2001 standard, PO-01. Humus was determined according to SR ISO 10694:1998, PO-0.3. K, Na, Ca, Mg, P, Fe, Zn, Cu, Mo, Mn, B were determined according to SR ISO 14870:2002, SR ISO 11263:1998, PO-04 Ed 2 Rev-0. Cl⁻, SO₄²⁻, N-NH₄⁺, N-NO₂⁻, N-NO₃⁻ were determined by standardized methods corresponding to PO-05, Ed 2, Rev-0. All chemical analyses were conducted in the „HOLLAND FARMING” Laboratory (Romania).

The study reveals that the optimal and efficient approach involves cold extraction of compost and vermicompost with agitation for a duration of 4 hours.

The same parameters were also analyzed regarding the samples of liquid biohumus available in the market: one from Turkey, another from Russia, and three samples of Moldovan origin, in order to assess the position, they can occupy in the landscape of liquid organic fertilizer production at the enterprise level.

After considering the results obtained, it can be concluded that the extract prepared at the enterprise exhibits significantly better parameters. It can be used as a microelement-containing fertilizer after a 1000-fold dilution and shows promise for inclusion in production.

Acknowledgments: The NARD of the Republic of Moldova financially supported the work under projects No. 23.80015.5007.269T and No. 20.80009.5007.11.

Keywords: *biohumus, dropping, humus, organic fertilizer, poultry waste, soil.*

ORGANIC COMPONENT OF MUNICIPAL SOLID WASTE AS A RAW MATERIAL FOR ORGANOMINERAL FERTILIZERS

Prikhodko Veronica, Tamerlan Safranov
Odessa State Ecological University, Ukraine
E-mail: vks26@ua.fm

One of the urgent tasks is to use the resource potential of solid household waste, in particular, the disposal of the most significant component - easily degradable organic waste. This paper presents an assessment of the prospects for using such waste for the production of fertilizers. In conditions of a decrease in humus content in soils, which is accompanied by a similar trend in the application of organic fertilizers from 9.4 t/ha (1985) to 0.5 t/ha (2017) with a minimum rate to ensure a deficit-free humus balance of 10 t/ha and above, the search for options is relevant. Research methods: mass balance of substances during complex recycling of organic waste. It has been shown that in the case of separating a stream of easily decomposed organic waste from the general stream of household waste at the time of generation, it is possible to obtain raw materials for the production of compost. Additionally, agricultural waste, food industry waste and sewage sludge can be disposed of.

A scheme for the integrated recycling of easily degradable organic waste is proposed, which consists of anaerobic fermentation of waste to produce biogas and digestate, which, if necessary, is composted aerobically.

However, an important condition for ensuring high quality raw materials is the selection of food waste from the general flow of solid household waste at the time of its formation. An assessment of the potential of Odessa in the case of 50% selection of food waste showed that the comprehensive disposal of 55.5 thousand tons of such waste will produce 4.9-12 thousand tons of compost, depending on the need for digestate processing. The use of such fertilizers allows you to involve nutrients in natural cycles and reduce the impact of waste on the environment. For example, carbon is removed in the form of organic compounds of compost and carbon dioxide and methane.

On the contrary, in the case of burial of such waste, about 27% of carbon is released with biogas over 50 years, and the remaining biogens are deposited in waste destruction products in the body of the landfill. Complex recycling can significantly reduce the time of deposition of nutrients in waste (from 2 to 12 months) and is a method of converting waste into organomineral fertilizer.

Keywords: biogenic elements, organomineral fertilizer, municipal solid waste, recycling.

COMPARATIVE ASSESSMENT OF THE SUITABILITY OF SOME SOILS IN THE REPUBLIC OF MOLDOVA REGARDING THE CULTIVATION OF SEA BUCKTHORN

**Andriucă Valentina, Cazmafi Nicolai, Bacean Ion,
Melnic Rodica, Donici Maxim**

Technical University of Moldova, Chisinau, Republic of Moldova
E-mail: valentina.andriuca@am.utm.md

The soil as support for sea buckthorn is a main component of the plantation, interspersed with multiple human actions in correlation with other important subsystems for the plant. Therefore, the establishment of sea buckthorn plantations in the Republic of Moldova (RM) would be imperative for perspective. If the location of plantations with sea buckthorn in the northern part of the RM, made on lands with more homogeneous soil cover and higher fertility creates problems and impediments, sometimes even elements of Ecopedological risk, LLC „Preambula”, Singerei district, Dobrogea Veche, the foundation of sustainable plantations in the central part of cantry, requires a more detailed comparative research of the specific soil cover.

In the Center Agricultural Area, Orhei and Calarasi districts, in some peripheral regions of the Central Codru–Ungheni, Hancesti, including the 14th Ecopedological district (Pohrebea locality, Dubasari district) were located 6 research polygons on the suitability of soils for plantations with sea buckthorn: Leordoiaia, Calarasi district, 7th Ecopedological district; Puținței, Clișova, Orhei district and Hancesti locality, 8th Ecopedological district; Valea Mare, Ungheni district, 10th Ecopedological district; Pohrebea, Dubasari district, 14th Ecopedological district.

Based on the research of 5 soil profiles, it was established that the good development of the plantation (LLC „Big Cuker”, Clisova, Orhei district, 4th year of vegetation, May 2022) corresponds to typical clay-loamy chernozems and unclogged clay carbonate chernozem (0-70 cm), with humiferous layer of abt. 0-70 cm and average fertility capacities. The assessment of the influence of soil carbonate depth on varieties shows that „Clara” tolerates soil carbonates better than „Mara” variety.

Some areas of heavy clay and clay soils, highlighted on the polygon in Putintei, Orhei district, induce problems on aeration and water regime, create conditions of inhomogeneity for the development of the root system of plantations, even toxicosis and diseases. Therefore, creating a homogeneous and uncompacted edaphic layer are some aspects in creating sustainable plantations with sea buckthorn in the RM.

Acknowledgments: This paper has been founded by Research Project (RM) 20.80009.5107.13.

Keywords: *brown and gray soils, chernozems, elements of potential fertility, sea buckthorn.*

ASSESSMENT OF WATER QUALITY IN THE ASPECT OF IRRIGATION OF AGRICULTURAL CROPS IN THE REPUBLIC OF MOLDOVA

**Andriucă Valentina, Lozan Raisa, Cazmalı Nicolai, Melnic Rodica,
Donici Maxim, Untilă Nicolae**

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: valentina.andriuca@am.utm.md

In the pedoclimatic conditions of the Republic of Moldova (RM), irrigation is one of the most efficient methods of optimizing the water regime of the soil. During 2020-2023, within projects on the establishment of sustainable agroecosystems of fruit crops in the RM, along with the research of soil cover and soil properties, some water sources, used or expected for irrigation, researched and qualitatively evaluated the water of the Prut and Dniester rivers, at the distribution intake, applied respectively in the Grozești irrigation system, were collected and analyzed. Nisporeni district and Slobozia Dusca locality, Criuleni district. A lot of samples of water from local sources were investigated to highlight the quality, avoid the risk of negative effects on soil and plants. Research carried out within the artificial lake, Malaiesti, Rascani district, the first decade of March, 2023 and after the deposition of 60 mm of precipitation (end of April) showed a significant level of increase in natural and anthropogenic water pollution. It has been pointed out that natural water is polluted with magnesium and sodium. The use of this water for irrigation will lead to salinization and solonetization of arable chernozems.

The research of irrigation water in Valea Mare village, Ungheni district, 2022 (artesian well), used in drip irrigation of the sea buckthorn plantation with clay carbonate chernozems („Toma Iurie” LLC) revealed a level of sodium content (% Na) of abt. 38%, good irrigation quality, evaluated according to the SAR coefficient = 2.7, which indicates that irrigation will show poor solonetization. The Stebler coefficient $K = 7.6$ corresponds to the rating - tolerance for irrigation. In general, this water can be used for irrigation in small norms during periods of increased risk of drought. During 2020-2022, the water quality for the irrigation of sea buckthorn of the chernozems plantation, LLC „Big Cuker”, Clisova, Orhei district, (30 ha) was researched and evaluated. The representative soil cover, consisting of typical low-humiferous chernozems and carbonate chernozems, presents a sector suitable for irrigation, but the quality of irrigation water is problematic. In May 2022, 6 sources of water for irrigation use were investigated, including Raut river water. Irrigation will negatively influence the state of the root system of sea buckthorn planted on brown soils. The root system of the plantation in conditions of excessive humidity was affected by fusariosis (Fusarium).

Acknowledgments: This paper has been founded by Research Project (RM) 20.80009.5107.13.

Keywords: *irrigation, irrigation indices, sea buckthorn, soils, water quality.*

CZU: 631.95:338.439

THE GENESIS OF FOOD SECURITY RISKS IN THE CONDITIONS OF AGRO-ECOSYSTEM DYSFUNCTIONS

Andriucă Valentina, Racovița Gheorghie

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: valentina.andriuca@am.utm.md

The inter-disciplinary and trans-sectoral agroecological methods emphasize the correlation between the criteria of structure and functionality of the agroecosystems of the crops exploited in the agricultural production system and the fields of food security. Research studies on the correlation between the components of the agroecosystems of the studied crops shows that productivity exerts a significant influence on the food security component such as availability - which signifies the physical existence of agri-food products from national resources, from imports, food aid and food warehouses within urban households. The comparative analysis of the global harvest values for the 2021-2022 agricultural year, shows maximum values of abt. 1565 thousand tons in the case of wheat, of abt. 960 thousand tons for sunflowers and abt. 2793 thousand tons - for corn crops.

Although maximum values of the global harvest have been obtained for the crops that are the trophic basis for animal feed, however, the data of the National Bureau of Statistics in the period of 41 years, denotes a dramatic reduction of the livestock at the national level. If, in 1980, the number of pigs in the country was of 2 million, in 2021 abt. 400 thousand were recorded. We observe a similar evolution in the case of cattle and sheep, which in 1980 registered abt. 1300 thousand and in 2021 around 500 thousand of sheep and only 100 thousand cattle.

The evaluation of exports of the specified crops reveals that the Republic of Moldova is a supplier of grain raw material, given the fact that in 2021 abt. 1038 thousand tons of wheat seeds, 630 thousand tons of sunflower seeds and abt. 1850 thousand tons of grain corn were exported, without being used by the domestic processing industry or for the livestock sector.

The current principles of organizing the national agricultural system, where we can estimate severe agro-ecosystem dysfunctions, one of the generating factors being the lack of zonal alignments and the predominance of three field crops for the cultivation of which approx. 80% of the total arable land can become a risk to food security. The current phenomenon of agro-ecosystem risk turns into a threat and can be characterized as - the use of own soil, economic, social and financial resources in order to ensure the food security of other states, respectively, consciously undermining the national food security system and also the stability of other economy and national security dimensions.

Keywords: agro-ecosystem imbalance, food security, productivity, systemic autonomy, undermining.

THE DILEMMA OF THE UNIQUENESS OF NOTATING ASSOCIATION HORIZONS REGARDING THE DIAGNOSTIC OF SOILS DISTRIBUTED IN THE REPUBLIC OF MOLDOVA IN CORRELATION WITH THE WORLD REFERENCE BASE FOR SOIL RESOURCES

Cojocaru Olesea¹, Filipov Fiodor², Lipșa Florin²

¹Technical University of Moldova, Chisinau, Republic of Moldova

²„Ion Ionescu de la Brad” University of Life Sciences, Iasi, Romania

E-mail: olesea.cojocaru@am.utm.md

The World Reference Base (WRB) is the international standard for the soil classification system, endorsed by the International Union of Soil Sciences. As far as possible, the diagnostic criteria match those of existing systems so that correlation with previous national and international systems is as simple as possible. The WRB is not predestined to replace national soil classification systems, but to be a tool for better correlation between national systems. The purpose of this paper is to identify and highlight the divergence of the scoring system of the association horizons of soils with similar properties or attributes spread over the territory of the Republic of Moldova. Some of which, characterized by a combination of attributes that reflect common, large-scale results of soil-forming processes, are thus identified and found in the fourth edition of the WRB that was launched in 2022. The ambiguities noting the horizons of association for the soils of the Republic of Moldova, must be correlated in a more concise way and closer to the WRB, being officially recognized by the public authorities of the country. As diagnostic materials, the factors that significantly influence soil formation processes based on their distinctive characteristics will serve you. This paper provides an overview of the association horizons diagnosed at the national level compared to those of the world, which may be useful to students of agriculture, forestry and engineering. In this case, the appropriate identification and connection of the diagnosis of association horizons to the new World Reference Base, will facilitate the national soil classification system in their naming and description, as well as the creation of legends for soil maps with specific land use. It is hoped that this publication will contribute to the general public and scientific community's awareness and understanding of the role of the universal soil science system.

The official Soviet soil classification was mainly used for soil mapping. According to V.V. Dokucaev, the essential characteristic and diagnosis of a soil is its morphological structure, on a vertical profile consisting of two main horizons and subsoil. The classification of the soils of the Republic of Moldova, was developed, discussed and adopted by the National Society of Soil Science of Moldova and confirmed as an official document by the Decision of the Government of the Republic of Moldova, is based on a special principle.

Keywords: *association horizon, divergence, soil diagnostics, Republic of Moldova, World Reference Base.*

EXPLORING MODERN TRENDS IN SOIL RESEARCH: RECENT ADVANCES AND DISCOVERIES

Cojocaru Olesea¹, Bujor Tatiana², Cojocaru Nicolae³

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*State University of Moldova, Chisinau, Republic of Moldova*

³*Academy of Economic Studies of Moldova (ASEM), Chisinau, Republic of Moldova*

E-mail: olesea.cojocaru@am.utm.md

Modern trends currently used in soil research are a priority for agriculture. For some reason, this is essential for a thriving economy for the territory of the Republic of Moldova. Even though soil is essential for sustainable food production, its quality and health can decline as cultivation becomes more intensive and inappropriate. The importance of healthy soil to our country cannot be ignored. That's why the use of the latest generation technologies for intelligent soil quality prediction gives us accurate and fast data about its condition. Modern automated survey techniques now provide intelligent soil prediction systems. The purpose of this article is to provide an analysis of the exploration of modern trends in soil research through the advances and discoveries of recent decades. Soil properties and quality, existing soil data set, soil map, soil nutrients required for crop growth - which can be compared today through these innovative techniques - are key to improving and maintaining soil health. So, the advanced trend in smart agriculture today can be an asset to improve the quality and production of agri-food in the country. Only if we take into account the maintenance of soil health, agriculture in the future will offer sufficient productivity to satisfy consumer demands and better product quality. Continued research in this aspect and their development may lead to more cost-effective, more suitable possibilities for better adaptation (including improved plant resistance) to climate change.

In recent years, there has been a notable change in the field of soil science, with researchers recognizing the need for modern techniques to improve work efficiency and reduce labor, time and expense. Consequently, new methods have been developed to address these challenges and advance the field of soil research. The assessment of modern trends in soil research involves a systematic approach that includes various materials and methods.

This article reviewed published scientific articles, books, relevant research monographs, academic journals, and conference proceedings related to soil science. Which include, in themselves, online soil datasets to identify patterns, correlations and trends in the described soil properties. The researchers' interdisciplinary approaches reflected in the papers, in turn involved collaboration with experts from related fields such as ecology, agronomy, geology and climate science to explore complex soil-ecosystem interactions and trends.

Keywords: agri-food production, climate change, modern trends in soil research, soil health, smart agriculture.

APPLIED AGROECOLOGICAL METHODS FOR EVALUATING THE AGROECOSYSTEMS OF FIELD CROPS

Racovița Gheorghe

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: gheorghe003@yahoo.com

Researchers in the agroecological field, due to the symbiotic structure of the relationships in the agroecosystem, have developed cross-sectoral methods of evaluation and study, where the central element is focused on the correlation between the environment and the activity of human society. The potential and effective productivity of the agro-ecosystems of field crops was researched on the fertility and soil properties monitoring polygons (no. 11, 12, 14) of IPAPS „Nicolae Dimo”, (2012-2014).

The structural evaluation of the agroecosystems of the studied crops, which occupy 83% of the arable surface of 1,219,000 ha and according to the respective components: 346 thousand hectares for the wheat crop (23% of the total); 373 thousand hectares for sunflowers (25% of the total); 500 thousand hectares for grain maize crops (33% of the total), reveal an inefficient using of agricultural potential at the national level.

The other 28 field crops, out of the total of 33 included in the statistical record, for the year 2021 occupied an area of only 86356 ha of the total arable area.

The difference in harvest highlighted in the research and analysis of the harvest indicators in the field and in the statistics, influences other criteria of agro-ecosystem structure - soil resources and their fertility, amplifying dehumification (humic degradation) and agrochemical degradation of soils, but the evaluation of the export of biophile elements and the depletion degree of soil fertility remains incomplete.

The comparative evaluation of the NPK exports according to the average harvest values in the field and the statistical harvest values, reveal that annually approx. 66.1 kg/ha in the case of wheat; 47.0 kg/ha in the case of sunflower and 47.4 kg/ha of N in the grain corn crop are not included in the evaluations of the extraction and export of nutrients by the researched agrocenoses.

In 2021-2022 agricultural year, exports of wheat crop according to the NBS data constituted abt. 1038 thousand tons, which represents the extraction and export from the soil of abt. 26026,0 t of N; 10068.6 t of P₂O₅ and 20760.0 t of K₂O. the export of the sunflower constituted abt. 500 thousand tons, being extracted 25,000.0 t of N from the soil; 7500.0 t of P₂O₅ and 48500.0 t of K₂O. Export amount of corn was abt. 1457 thousand tons, which constitutes abt. 31 908.3 t of N; 12 980.0 t of P₂O₅ and 30 451.3 t of K₂O extracted and exported from the soil.

Keywords: agroecosystem, effective fertility, dehumification, field crops.

FEATURES OF HONEY CONVEYOR IN THE ZONE OF INDUSTRIAL AGROBIOCENOSIS

Komlatsky Vasily, Leshchenko Igor

Kuban State Agrarian University, Krasnodar, Russia,

E-mail: kubanagro@list.ru

The purpose of the research is to analyze the structure of honey plants in the zone of industrial agrobiocenosis.

The object of the study was the honey conveyor of the Krasnodar region. During the study, general methods of scientific knowledge were used, as well as abstract-logical, monographic, statistical and economic methods. The empirical basis that ensures the reliability of the conclusions is the statistical materials of the Russian state statistical bodies and the results of our own research.

The melliferous potential of Kuban is represented by wild representatives and numerous entomophilous agricultural crops. The „main” spring honey plant in the Krasnodar region is considered to be white acacia. Under favorable conditions, one bee colony produces 8-15 kg of honey. In the steppe zone, the gain of the control hive is 13 kg over 10 days of honey collection.

After pumping out May (black maple, hawthorn) and acacia honey, a period of maintenance honey collection begins, which is realized in the south of the country through the crops of sweet clover, phacelia, sainfoin and other entomophilous crops. Chestnut honey is exclusive, differing from other types of honey products with its unique aroma and dark color.

The basis of the honey production conveyor consists of numerous entomophilous agricultural crops, therefore the vector for the development of beekeeping in the region is the pollinating activity of bees. The main honey yield in the Krasnodar region comes from sunflower. Large areas of this oilseed crop make it possible to obtain large quantities of honey. At the same time, due to the shortage of bee colonies, under-pollination occurs, which leads to a decrease not only in yield, but also in the quality of seeds.

The vector for the development of beekeeping in the region is pollination activity. To increase the efficiency of pollination, it is necessary to increase the number of bee colonies, and to timely deliver bees to the beginning of flowering, use mobile honey-pollinating complexes.

Keywords: beekeeping, industrial agrobiocenosis, honey conveyor.

CURRENT TRENDS AND CHALLENGES IN SOUTH AFRICAN HIGHER EDUCATION AND INFLUENCING THE CHOICE OF AGRICULTURAL STUDIES

Ngaikosset J.

IT Technician, Munayd, Arcadia, Pretoria, South Africa

E-mail: jnpqt91@gmail.com

The number of students enrolled in agricultural courses at South Africa universities is low compared to other courses. The purpose of this study was therefore to identify factors influencing the choice of agriculture to study by undergraduate agriculture students at an Open and Distance Learning University in South Africa. An interlocked set of social, demographic, economic, technological, environmental and political change forces is bearing down on higher education'. This statement gives credence to the title of this introductory article that higher education in South Africa is facing challenges. The article gives some insight on some specific challenges currently being faced in higher education and some of the trends that are emerging. By nature, higher education teaching, learning and research is always on the cutting edge, meeting new challenges and taking knowledge development to unreached heights. The danger is that sometimes the cost of advancement does not take into consideration the scope of diversity that needs to exist in order to serve the existing multiplicity of people and functions without ending up in over-competitiveness for positions in a steeply stratified higher education system. The study also investigated the impact of the three agricultural curricula taught at school level and how well they prepared students for tertiary education. Both qualitative and quantitative research methods were used. Open distance learning agriculture students and agriculture teachers participated in the study. A structured online questionnaire and an open-ended questionnaire were used. The study revealed that two major composite variables, namely family, friends, and career considerations, were highly significant in students' choice of agriculture at tertiary level. The impact of the agricultural curricula taught in schools in preparation for tertiary education provided learners with basic terminology and concepts related to agriculture. The study also identified challenges faced by agricultural science educators, including learners' negative attitudes towards the subject, inadequate or lack of infrastructure, and lack of proper guidance and counselling in subject choice as factors that could hinder effective teaching and learning of agriculture in South African schools. Students studying through ODL cited convenience, flexibility to study at their own pace and sufficient time for family and work as factors that influenced their decision to study through ODL. Recommendations for the improvement of the agriculture curriculum in South African schools and the encouragement of more students to enroll in agriculture as a subject of study at tertiary level after the completion of Grade 12 are discussed in detail in the study.

Keywords: agricultural curricula, assessment and evaluation, career choice, career guidance, learners' attitude towards farming, parent.

SESSION II - HORTICULTURE, FORESTRY AND PLANT PROTECTION

Subsection - 2.1 Horticulture

CZU: 634.232:631.542

THE IMPACT OF THE PRUNING TIME ON THE YIELD AND SIZE OF THE FRUIT OF SWEET CHERRY TREES OF THE STELLA AND SKEENA VARIETIES GRAFTED ON MAXMA 14

Șarban Vasile

Ministry of Agriculture and Food Industry, Chisinau, Republic of Moldova

E-mail: sarbanvasile@gmail.com

The pruning of trees in early autumn is very important, as the main branches and sub branches that thicken the crown are clearly visible, and favorable conditions are created for the differentiation of fruit buds. In spring, new well-developed shoots appear on the pruned branches, which, in turn, produce fruiting branches. The research has aimed at evaluating the maintenance and the fruiting pruning of sweet cherry trees of the Stella and Skeena varieties, grafted on the MaxMa 14 rootstock, both during the rest period and the vegetation period. Between the years 2019 and 2021, in the central area of the Republic of Moldova, the impact of the pruning period of the sweet cherry trees (*Prunus avium* L.) of the Stella and Skeena varieties, grafted on MaxMa 14, which were planted in 2012 at a distance of 5x3 m was evaluated. The trees had naturally improved reduced volume crowns. The pruning during the rest period and the vegetation period was studied, namely: the pruning during the rest period (the control group); the pruning during the blossoming period; the pruning after harvest (in July); the pruning in early autumn (the first decade of September). Blossoming and fruit ripening time, trunk cross-sectional area (TCSA), and the yield and distribution of fruit according to their diameter were also studied. The time of the tree pruning did not have any impact either on the blossoming time or the harvest time. The pruning period influenced the yield per tree and per unit area, and the yield of sweet cherries of the Stella and Skeena varieties, grafted on MaxMa 14, was high. The pruning done in early autumn contributed positively to the harvest volume, fruit diameter and diameter distribution, while reducing the number of fruits per tree. The positive impact was manifested by an increase in the number of fruit (15.8-34.2%) with a diameter of 28 mm or more, as well as a decrease in the proportion (4.4-4.5%) of fruit with a diameter of 24 mm and smaller, without affecting the overall yield. The results showed that the pruning period had a significant impact on fruit quality and yield increase. The pruning done in early autumn reduced the number of small fruit and increased the number of fruits over 28 mm in diameter. Further research is needed to assess the effect of pruning time on yield and, in particular, on the diameter, weight and distribution of marketable fruit.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: *fruit diameter, pruning, sweet cherry, sweet cherry tree.*

CZU: 634.1(478)

ACHIEVEMENTS AND PROSPECTS FOR THE DEVELOPMENT OF FRUIT GROWING IN THE REPUBLIC OF MOLDOVA

Balan Valerian

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: valerian.balan@h.utm.md

The development of the fruit growing in the Republic of Moldova has always been based on advanced researches. Scientific studies have been carried out which led to the development of physiological and technological foundations for the intensification of the cultivation of fruit plants. The objectives of this study were focused on the development of principles and methods for optimizing the parameters of the orchard structure, which depend on the vigour of the variety, the rootstock used, the fertility and moisture of the soil, the system of tree care and pruning as the main productivity factors.

The studies were carried out in the field using physiological, biochemical and biometric analyses. Analysis, synthesis, tabular, comparative and graphical methods were used in order to interpret the scientific results. The results have been published in scientific and methodological and didactic works, including patents, books, manuals and monographs, which demonstrate all scientific and technical aspects related to the growth and fruiting of fruit trees.

The scientific research programs were focused on fundamental and practical research aimed at solving complex problems of modernizing the technology of growing trees in orchards, creating and operating intensive and super-intensive orchards of apple, cherry and other fruit trees, namely: optimizing the optimal parameters of the garden structure, including optimal distances between trees depending on the crown size, determined by the growth vigour of the variety and rootstock, soil fertility and moisture, tree care system and pruning; the development and implementation of modern technologies for growing apple and sweet cherry trees in an intensive and super-intensive growing system.

The development of fruit growing involves planting orchards in the most favorable environmental, economic and production conditions; the growing of orchards of virus-free, highly productive varieties with a shortened operating cycle; the implementation of sustainable, integrated growing systems; the introduction of advanced methods of fruit production, in order to improve the quality and competitiveness of fruits on the market and to achieve high economic efficiency while reducing traditional energy consumption.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: *fruit growing, orchard management, orchard productivity.*

METHOD FOR DETERMINING THE LEAF AREA IN SWEET CHERRY TREE VARIETIES (*PRUNUS AVIUM L.*)

**Balan Valerian, Russu Stanislav, Buză Cornel, Dodica Dmitri,
Talpalaru Dumitru, Muguliuc Marian**

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: valerian.balan@h.utm.md

Non-destructive methods for determining tree leaf area are a useful tool for physiological and agronomic research. The purpose of this work was to carry out a comparative analysis of the methods used to determine the surface of leaves of fruit plants by linear measurements of the height and width of the crown and the leaf density, which would make it possible to determine the photosynthetic potential and the leaf index of the orchard during the growing season without leaf destruction.

The Regina cherry variety, grafted onto the Maxma 14 rootstock, planted in 2011 at a distance of 5x3 m was studied. The surface of the leaf blades was determined using the weight of leaf blades, the number, area and weight of round cuts. The conversion factor or regression equation relating the area of a leaf to its linear dimensions (length-width) was used to determine the area of the leaf.

The method consists of assessing the leaf surface by the density of leaves found on one linear meter in the crowns and rows of trees. An algorithm and regression equations have been developed to estimate PFL and IF according to the following scheme: the determination of the average leaf area per unit volume, including one linear meter of volume of tree rows. The method involves placing a one-meter ruler at different angles to the vertical in the crown several times. The average leaf surface per unit volume is determined by the number of found leaves (N) per linear meter and the average area of a leaf (Sf), calculated using the gravimetric method. The actual volume of the crown is determined depending on the height of the crown (H), the width of the central part of the crown (B), and the distance between the rows of trees (L). The leaf surface per 1 m² of crown projection on the ground (PFL) and per 1 m² of the orchard surface (IF) is calculated according to the following formulas: $PFL = Sf * N3 * H, m^2/m^2$ (1); $IF = PFL * B/L, m^2/m^2$ (2).

As a result of the study, a model for calculating PFL and IF was proposed, based on the average number of leaves per 1 linear meter of crown volume and the average leaf surface of the Regina sweet cherry variety, grafted on MaxMa 14, planted at a distance of 5x3 m. The method is an effective and easily accessible way to assess the surface of leaves without destroying them.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: leaf area, sweet cherry tree (*Prunus avium L.*).

THE INFLUENCE OF THE VARIETY AND THE PLANTING PERIOD ON THE DEVELOPMENT AND PRODUCTIVITY OF THE STRAWBERRY PLANTATION

Baraniuc Vladislav, Manziuc Valerii

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: valerii.manziuc@h.utm.md

The present work was aimed at resolving these issues. Marmolada, Aprika and Sibilla strawberry varieties and three planting dates - the middle of June, July and August months - were taken as an object of research.

Early terms of strawberry planting promoted good tailoring and formation of 3.5 to 5.3 corms per bush on average for the studied varieties, while at planting on August 12 no more than two corms per bush were formed. Strawberry plants formed as well-developed leaf surface, 20 - 26 leaves per shrub, insignificantly different from the number of leaves formed in the second year of vegetation. Planting on August 12 resulted in a decrease in 2.3 - 2.8 times the number of leaves per shrub.

Early planting dates contributed to an increase in the number of pedicels per plant by 2.2 - 2.7 times, as well as to an increase in fruits per pedicel. This indicator reached the highest values in the variety „Marmolada”. Among the studied varieties, the highest average berry weight is characterized by the variety „Aprika” regardless of planting dates. The most productive among the studied varieties is the variety „Marmolada”, whose productivity in the first year of fruiting was the highest when planted on June 26 and amounted to 26.9 tons / ha. Late planting date of August 12 resulted in 2.2-2.7 times lower yield of plantations.

Among the studied varieties, the cultivars „Aprica” and „Sibilla” are characterized by the timeliest ripening of berries, in which the harvesting period lasts almost 20 days, and in the variety "Marmolada" it was more extended: the first two harvests were significantly lower than the third and fifth, the period stretched to 30 days.

The advantage of early planting dates of strawberries in the conditions of the Republic of Moldova, which contribute to the first harvest is more than twice as high compared to the recommended dates - the first half of August. Revenue from the sale of strawberries in the first year of fruiting at early planting dates varies from 500 to 640 thousand lei per hectare. The highest level of profitability among the studied varieties was in the variety „Sibilla” and amounted to 294.1%, which is due to both high yield and average selling price. Late planting dates led to a decrease in the level of profitability more than twice compared to planting on June 26.

Acknowledgments: This study was supported by the NARD of the Republic of Moldova, project 20.80009.5107.04 „Adaptation of sustainable and ecological technologies of fruit production under quantitative and qualitative aspect according to the integrity of the culture system and climate changes”. Project director, Doctor Habil. , university professor, Valerian BALAN.

Keywords: *cultivars, frigo plants, productivity, strawberry, time of planting.*

CZU: 634.743:631.54

GROWTH AND FRUITING OF SEA BUCKTHORN VARIETIES AS A FUNCTION OF PLANTING DISTANCE AND ORCHARD STRUCTURE

Popa Sergiu, Rîbințev Ion

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: sergiu.popa@h.utm.md

In order to be competitive on the fruit market, it is necessary to apply technologies that allow us to have small investments at a high level of profitability. The most important technological link in the fruit cultivation process is the correct choice of planting distances, and the formation of an economical efficient structure.

In order to determinate the optimal nutrition surface and the optimal structure of the plantations, scientific investigations were carried out in the sea buckthorn plantation in the Dubasari district, Pohrebea village, within the plantation given or studied, the planting distances: 3.50 x 1.00; 3.50 X 1.50; 3.50 X 2.00 and 3.50 X 2.50 m.

The planting distance influences significantly both the growth indicators and the fruiting potential of the plantation. At a higher plant density per unit area, the overall yield increases.

Along with the plant density per unit area, the plantation structure is a decisive factor in the development and fruiting of the sea buckthorn trees. Planting density is a factor that has a major influence on the development of sea buckthorn plants. In the plantations with high density, the plants have a weaker intensity in development, while in the plantations with a lower density due to the larger surface of nutrition, the sea buckthorn plants have a higher growth. Regarding the influence of the structure of the plantation on the formation of the harvest, it can be concluded that within the increase of the number of trees per surface unit, the harvest is higher.

Acknowledgments: This study was supported by the NARD of the Republic of Moldova, project 20.80009.5107.13 „Development of the production technology of white sea buckthorn in an ecological system and the processing of fruits and biomass”, Project director, associate professor, Popa Sergiu.

Keywords: density, nutrition surface, sea buckthorn.

CZU: 631.531.02

AGROBIOLOGICAL EVALUATION OF INTRODUCED VARIETIES OF SEED CROPS IN THE CONDITIONS OF THE VOLGOGRAD REGION

Rîbintev Alexandru¹, Popa Sergiu², Rîbintev Ion²

¹*Volgograd State Agrarian University, Federal State Budgetary Educational Institution of Higher Education, Volgograd, Russia*

²*Technical University of Moldova, Chisinau, Republic of Moldova*

E-mail: rybintsev.00@mail.ru

Planting industrial gardens with introduced seedlings makes it possible to create highly productive fruit plantations

The objectives of this research are to select varieties of fruit crops, determine their productivity and closely relate them to environmental conditions to determine the ecological potential of the studied crops in a particular place.

The research methodology is based on the integrated use of field and laboratory methods of working with fruit crops. The experiment was started in the spring of 2017 with apple tree varieties on M rootstocks; MM-106. Florina, Gala, Idared and pear varieties on rootstock BA-29 Lyubimitsa Klappa, Conference, Curé. Planting pattern 5x3 m, chestnut soil, drip irrigation, 3-fold repetition.

Phenological observations of apple and pear varieties make it possible to determine the length of the growing season of each studied variety and establish the degree of correspondence of the period to its growing season. An apple tree variety sufficiently resistant to powdery mildew - Florina - has been identified. The most damaged variety is Idared. The Idared variety is also resistant to brown spot. But it has almost no resistance to scab and powdery mildew. Florina is resistant to monilial burn and immune to scab. The overall assessment of the apple tree's protection from diseases is high. Rust affects only when there is a deficiency of potassium and phosphorus. It is possible to identify the potential yield of a variety only against the background of high agricultural technology. The best variety is the one that combines high yield and good quality fruit. For the Gala variety, the average fruit yield per tree was only 20.2 kg, while in favorable years this variety produced 35-40 kg per tree. For other varieties, the yield was slightly higher: from 24.3 kg for the Florina variety, to 28.0 kg for the Idared variety. But this is also below their possible potential.

The pear variety Clapp's favorite had a maximum weight yield of 48.5, while the Conference variety had the lowest yield, which was 25.7. But this is also below the possible potential.

Keywords: diseases, harvest, feedings, light, moisture, phenology, soil, varieties of fruit crops.

PRELIMINARY RESULTS OF MICROPAGATION OF VEGETATIVE ROOTSTOCK FOR PLUM AND APRICOT WAVIT

Gendov Natalia, Chernets Alexandr, Kovalenko Galina

*Public Institution Scientific-Practical Institute of Horticulture and Food
Technologies, Chisinau, Republic of Moldova
E-mail: colinda@mail.ru*

Currently, when growing seedlings of stone fruit crops, different types of rootstocks are used, which affect the strength of the growth of trees in the future garden, their productivity and resistance to many adverse environmental factors. All this allows one to optimally plan the efficiency and criteria for establishing plantings. Wavit is a promising, medium-sized rootstock for large stone fruits and has been zoned in the Republic of Moldova since 2021. Plants of the Wavit Prudom rootstock transferred to our institute from Germany served as the material for the research. The tops of actively vegetating plants, as well as green cuttings with axillary bud, were introduced into *in vitro* culture. Sterilization of plant material was performed using HMJ Tabidez 56, H₂O₂. Was used Murashige-Skoog (MS) and Gamborg (B5) media. Tops of actively vegetating plants and axillary buds with a part of the shoot demonstrated resistance to the toxic effect of the sterilizer and retained the ability for further development. Comparison of proliferation activity on two different nutrient media did not reveal significant differences for the rootstock under study. On MS medium with BAP 0.5 mg/l, the multiplication factor was 3; on B5 plus BAP 0.5 mg/l - multiplication factor was 2.8. Increasing the concentration of cytokinin in the medium to 1.5 mg/l proportionally increased the yield of additional shoots to 4.5 on MS medium and to 4.3 on B5 medium. Green cuttings of the rootstock for 5 years showed the possibility of root formation from 0 to 30%. There was no dependence on the concentration of the tested auxin and exposure time. Therefore, the main method of rootstock propagation is micropropagation. The results of the work done showed that propagation of Wavit rootstock can be successfully carried out by microclonal propagation. This will significantly reduce reproduction time and costs. Propagated *in vitro* and grown to a height of 30-60 cm, Wavit pond plants will be tested in variety-rootstock combinations with zoned and promising plum varieties under soil and climatic conditions of the Republic of Moldova.

Acknowledgments: This study was supported by the research project of the State program 20.80009.5107.14, „The use of modern genetic methods and biotechnologies for the breeding, development and implementation in production of varieties of fruit crops, rootstocks and bacillus crops with enhanced biological potential” funded by laboratory of virology, phytosanitary control and protection of fruit plantations, Public Institution Scientific and Practical Institute of Horticulture and Food Technologies, Republic of Moldova, Chisinau.

Keywords: *acclimatization, growth stimulators, in vitro, micropropagation, nutrient medium, rootstock, rooting, sterilization.*

THE EFFECTIVENESS OF BIOSTIMULATOR GOEMAR BM 86 ON APPLE FRUIT YIELD AND QUALITY

**Gudumac Eugeniu, Pesteanu Ananie, Cumpanici Andrei,
Buciuceanu Mihail, Dascălu Nicolae**

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ananie.pesteanu@h.utm.md

The Gala Buckeye apple variety grafted on the M9 rootstock was taken as the object of study. Crown shape vertical axis. Planting distance of 3.5 x 0.8 m. To study the degree of binding and fruit production, the following variants were tested: 1. Control - no treatment; 2. Goemar BM 86, 2.0 l/ha; 3. Goemar BM 86, 3.0 l/ha. The amount of solution administered 1000 l/ha. The investigations carried out show that a smaller number of fruits in the crown were recorded in the control variant, 57 pcs/tree, compared to the variants treated with the biostimulator Goemar BM 86, 65-70 pcs/tree, where an increase with 14.0 - 22.8% compared to the control variant. The highest number of fruits in the crown of the tree was obtained in the variant treated with the biostimulator Goemar BM 86 in a dose of 3.0 l/ha - 70 pcs/tree. The study carried out on the degree of flowering showed that in the control variant, the given indicator was 9.3%, but in the variants treated with the biostimulator Goemar BM 86 it increased to 10.4-11.6%. Higher values of the degree of binding of flowers was recorded in the Goemar BM 86 variant, in the dose of 3.0 l/ha, constituting 11.6%. The variant treated with the Goemar BM 86 biostimulator at a dose of 2.0 l/ha recorded average values (10.4%) between the previous variant and the control variant.

As the control variant recorded the lowest number of fruits per tree, consequently, this variant also produced lower yields both within a tree (9.06 kg) and per unit area (32.36 t/ha). In the variants in which foliar fertilization was carried out with the Goemar BM 86 biostimulator in doses of 2.0 l/ha and 3.0 l/ha, in the spring period, due to the increase in the number of fruits on the tree and a slight decrease in the average weight of a fruit, increased productivity per tree and within a unit area. If in the version Goemar BM 86 in the dose of 2.0 l/ha, the production per tree and per surface unit was 9.88 kg/tree and 35.28 t/ha, respectively, this indicator in question increased within the variant Goemar BM 86 in the dose of 3.0 l/ha at 10.57 kg/pom and respectively 37.74 t/ha.

The results obtained allow us to include the growth bioregulator Goemar BM 86 in the technological scheme of cultivating the apple culture in the dose of 3.0 l/ha, applied. 3 times by spraying.

Acknowledgments: This study was supported by the NARD of the Republic of Moldova, project 20.80009.5107.04, „Adaptation of sustainable and ecological technologies of fruit production under quantitative and qualitative aspect according to the integrity of the culture system and climate changes”. Project director, Doctor Habil. university professor Valerian BALAN.

Keywords: *apple, bio regulator, productivity, setting, variety.*

THE EFFECT OF AGROTECHNICAL PROCEDURES ON THE GROWTH AND PRODUCTIVITY OF DIFFERENT PLUM'S VARIETY-ROOTSTOCK COMBINATIONS

Grosu Ion, Grițcan Sava, Cucu Ghenadie, Cojoharenco Valerii, Evtodiev Mihai, Magalatiev Olga

Public Institution Scientific-Practical Institute of Horticulture and Food Technologies, Chisinau, Republic of Moldova

E-mail: igrosu2003@gmail.com

The establishment of plum plantations, their productivity largely depends on the variety-rootstock combination. In the Republic of Moldova, the main rootstock used and approved for plum cultivation is the Cherry Plum. Plum trees grafted on the Cherry Plum have an average and above-average growth vigor. The root system of the trees is distinguished by a high adaptability to the climatic conditions of Moldova, good resistance to diseases and pests, good adaptability to most types of soil from the Republic of Moldova.

The intensive plum orchard located on an area of 3 ha, the private property of SRL „AMV-Grape” from the Vadul lui Isac village, Cahul district, was planted respecting the planting distance of 5.0 x 3.0 m – 667 trees/ha. The Super Prezident variety under study is a new variety, recently approved, grafted on two rootstocks – Cherry Plum and Cubani-86. The crown has the form of a spindle. The first variant - the Super Prezident variety grafted on the Cherry Plum seed rootstock approved in the Republic of Moldova – control sample. The second variant – the Super Prezident variety grafted on the Cubani-86 vegetative rootstock. The number of repetitions for each variant is 4. The number of trees in a repetition is about 6-8. Placement of replicates - randomized. The research was carried out under field and laboratory conditions.

The trunk thickness of the Super Prezident plum trees studied, regardless of the rootstock, increased constantly, recording an increase of 3.2–4.4 cm in the 4th and 6th years of vegetation. The height of the Super Prezident variety plum trees at the end of the 6th year of vegetation varies from 3.1 m for the trees grafted on Cherry Plum to 3.2 m for the trees grafted on the Cubani-86 rootstock. It was established that the fruit yield per tree at the end of the 4th year of vegetation at the Super Prezident plum tree on Cubani-86 rootstock was 7.43 kg, and in the one on Cherry Plum- 2.42 kg, in the 5th year after planting - 11.1 and 8.8 kg, and in the 6th year after planting - 24.00 and 11.40 kg, respectively.

Acknowledgments: This study was supported by the research project of the State program 20.80009.5107.22, „Development and upgrading of sustainable and environmentally friendly technologies for fruit and berry species under climate change conditions”, (Development and modernization of sustainable and ecological technologies of fruit and baciferal species under climate change conditions), 2020–2023 funded by ANCD and MAIA.

Keywords: *chlorophyll, intensive variety, leaf surface, rootstock, trunk thickness, system, productivity.*

CZU: 634.51:631.147

STUDY OF GROWTH AND PRODUCTIVITY OF WALNUT TREES IN THE ECOLOGICAL SYSTEM OF AGROTECHNICS

**Grosu Ion, Grițcan Sava, Magher Mihail, Dumitraș Iurii, Cucu Ghenadie,
Cojoharenco Valerii, Dadu Zinaida**

*Public Institution Scientific-Practical Institute of Horticulture and Food
Technologies, Chisinau, Republic of Moldova*

E-mail: igrosu2003@gmail.com

In recent years, both in the EU countries and in the Republic of Moldova fruit consumers increasingly demand organic production in their dietary requirements. The experience is located on the Chandler walnut variety, „Pomul Regal” Ltd., Inesti village, Telenesti district. Planting distance 7.0 X 8.0 m. The variant no. 1 (control) - traditional agrotechnical system. The soil in the intervals between the rows and on the rows of trees is maintained as black field. Mineral fertilizers are applied annually in autumn in the grooves on both sides of the trees at a depth of 20-22 cm. The variant no. 2 - ecological agrotechnical system. The soil in the intervals between the rows was maintained by sowing sideral crops and natural grassing, and the strips along the rows of trees are maintained as black field. Organic fertilizers –the Orgazot was applied to the soil in early spring, and the Eutrofitfoliar fertilizer was applied at 10-14 days intervals during intensive shoot and fruit growth. Disease and pest protection were carried out with ecological products (bioinsecticides: Pelecol – 10.0 l/ha, BioStar – 2.5 l/ha, MatrinBio, SL – 1.5 l/ha; biofungicides: Serenade ASO – 8.0 l/ha, BioBacter – 8.0 l/ha). The treatments were performed with an interval of 7-10 days. The number of repetitions in each variant is 3. The number of trees in repetition is between 8-10. Placement of repetitions is randomized. The research takes place in field and laboratory conditions. The biological efficiency of the biofungicides complex used against brown spot of walnut is –in 2020 - 92.5% leaves, 93.1% fruits; in 2021 – 88.8% leaves, 88.4% fruits and in 2022 – 90.4% leaves, 88.8% fruits, respectively. The biological efficiency of the biological products against the apple worm and the oriental worm that attacks the walnut reached the limit of 89.5% - 89.1% - 89.6%, in the traditional version corresponding to 93.1% - 91.5% - 92.7 %. The average weight of a fruit in the control variant is 11.71 g and, in the variants, Sideral Crops and Orgazot 120 kg/ha – 13.07-13.86 g. When applying the fertilizer Orgazot 150 kg/ha and Orgazot 120 kg/ha + Eutrofit 5.0 l/ha the mass of a fruit is 14.00-14.05 g.

Acknowledgments: This study was supported by the research project of the State program 20.80009.5107.22, „Development and upgrading of sustainable and environmentally friendly technologies for fruit and berry species under climate change conditions” (Development and modernization of sustainable and ecological technologies of fruit and baciferal species under climate change conditions), 2020–2023 funded by ANCD and MAIA.

Keywords: *chlorophyll, intensive system, leaf surface, productivity, variety, trunk thickness.*

CZU: 635.65:631.147

THE ROLE AND IMPORTANCE OF ISOLATION DISTANCES IN ORGANIC SEED PRODUCTION OF VEGETABLES

**Iliev Petru, Ilieva Irina, Plugaru Simion, Pavalache Vasile,
Alexeonoc Valentina**

*Public Institution Scientific-Practical Institute of Horticulture and Food
Technologies, Chisinau, Republic of Moldova
e- mail: petru.iliev27@gmail.com*

In the article are analyzed and discussed the results about vegetable organic seed production on limited areas, and their biological purity in dependents of ensuring isolation distances. The isolation distance varies from 50-100m in self-pollinated crops like tomato, sweet peas, beans, sweet pepper, eggplant etc. to 1000-1500 m in the case of carrot, radishe, onion, red beet. Minimum isolation distance recommendations are dependent on the context of the growing environment. In the same time the minimum isolation distance required for a foundation seed crop is markedly greater than that for a certified seed crop. Maintaining adequate isolation distances to prevent cross-pollination by crops of the same species is crucial to preserving seed variety integrity.

This subject is quite important in organic seed production of vegetables, where the production areas a smaller in comparison with cereal crops and insect species diversity are much greater and this situation leads to higher incidence of out crossing. The distance required varies widely and is influenced by many factors in the seed production environment including pollinator density, presence or absence of plant and physical barriers, and wind direction and intensity. Unfortunately available literature dates on determining isolation distances for seed crops is extremely varied and may not be accurate for organic seed growers. Seed growers must always be aware of the cultivars, varieties, or types of a particular species that are being grown in their region that may cross with their seed crops. In addition, it is important to familiarize yourself with related crops or weedy species that are capable of crossing with your seed crop. In the cases of multiplication several varieties of the same species and the required isolation in space is not possible there are advised several techniques of isolation, such as using of barrier crops, plant in blocks, collecting seed from fruits produced during peak flowering, from plants from the center of block, isolation in time, mechanical isolation, etc. which could reduce from negative impacts of purities and homogeneity of reproduced seeds. In the same time, we mentioned that these methods – advises can be prescribed compulsorily instead of established isolation distance for each crop.

Acknowledgments: This study was supported by the research project number 20.80009.5107.26 „Development and modernization of potatoes and vegetables production technologies in the context of climate changes for insurance purposes of stable inoffensive and sustainable production”, funded by National Agency for Research and Development.

Keywords: *isolation dastans, vegetables seed productions.*

STRUCTURE OF THE VEGETATIVE ASSEMBLY OF APPLE TREES ACCORDING TO AGE AND THE BIOLOGICAL CHARACTERISTICS OF THE VARIETY

Bilici Inna

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: inna.bilici@h.utm.md

This work refers to the study of the structure of the vegetative ensemble of apple trees organized in the experimental orchards of SRL „Elit Fruct” and SRL „Prodcar”. The apple varieties Granny Smith, Gala Delicious, Gala Buckeye Simmons, Golden Delicious, Golden Delicious Reinders, Red Velox and Fuji Kiku, grafted on M9, intended for the establishment of high-density plantations, cultivated in the conditions of the central area of the Republic of Moldova. The vegetative growth of the trees in the apple varieties taken in the study is expressed, quantitatively, by the volume of vegetative growth accumulated annually by the size of the height and width of the crown of the trees, by the size of the surface and volume of the crown, as well as the level of soil coverage of the whole vegetative growth of trees. The vegetative growth of the trees in the apple varieties taken in the study is expressed, quantitatively, by the volume of vegetative growth accumulated annually by the size of the height and width of the crown of the trees, by the size of the surface and volume of the crown, as well as the level of soil coverage of the whole vegetative growth of trees. The height of the crown, in the studied varieties, was 256-282 cm in the 3rd year after planting. The variety Red Velox, of weak vigor, recorded the lowest value (256 cm) of crown height. The width of the crown at the base recorded maximum values (105-124 cm) admissible in relation to the distance of planting trees in a row (80 cm). The width of the crown at the top depends on the growth vigor of the variety and varied between 25 cm, in the variety Red Velox, and 65 cm, in the variety Granny Smith (control) of high vigor. From the data obtained regarding the height of the trees, it follows that the trees of the Red Velox variety have the lowest height both in 2017 (272 cm) and in 2019 (271 cm). The medium to high vigor varieties (Gala Buckeye Simmons, Granny Smith (witness) and Golden Delicious Reinders) exceed the height of the less vigorous trees (Red Velox) by 50-100 cm. The volume of the crown varies depending on the size of the trees, and these are influenced by the vigor of the variety. The studied varieties form a continuous crown in the direction of the row, which allows receiving no more than 43.8% of solar energy.

Acknowledgments: This study was supported by the National Agency for Research and Development of the Republic of Moldova, project 18.817.05.29A „Improving maintenance technologies of super-intensive cherry and apple orchards, developing techniques for training fruit quality on a European level”. Project director, Doctor Habil. , university professor, Valerian BALAN.

Keywords: *apple variety, crown of trees, vegetative ensemble.*

**FRUIT YIELD OF THE VARIETIES GALA BUCKEYE SIMMONS
AND RED VELOX DEPENDING ON THE LOCATION OF THE
PLANTATION AND THE AGE OF THE TREES**

Bilici Inna

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: inna.bilici@h.utm.md

In this paper, the fruit yield of Gala Buckeye Simmons and Red Velox apple varieties, grafted on M9 rootstock, is studied. The experience took place in the experimental orchards of LTD „Elit Fruct” and LTD „Prodcar”. In favorable conditions for carrying out the photosynthetic processes and depending on the applied technology, high fruit yields can be obtained, which, in economic terms, would satisfy the fruit producers and the interest in the culture. Analyzing the fruit yield values for the first 6 years of fruiting of Gala Buckeye Simmons and Red Velox apple trees compared to the data presented by other authors, it can be stated that they are of an average level compared to those considered normal. From the data presented regarding the fruit harvest, it follows that the studied varieties began to bear fruit from the 2nd year after planting. We mention that the 2-year-old trees had, at planting, a well-developed axis and 5-7 well-developed anticipated branches, located radially around the axis. In the year of planting, all varieties had 1-2 fruits per tree. The harvest in the 2nd year after planting (year 2016) was 6.4-8.32 kg/tree. The highest yield was recorded for the Red Velox variety (8.32 kg/tree). In 2017, for 3-year-old trees, the fruit yield doubled and was from 14.4 kg/tree, for the Red Velox variety, to 19.92 kg/tree, for the Gala Buckeye Simmons variety. In 2018, the fruit harvest decreased considerably and constituted only 8.00-11.07 kg/tree. This decrease is explained by the fact that the trees were overloaded with fruit the previous year. In the 5th year after planting (year 2019), the fruit harvest increased significantly compared to previous years and varies from 8.71 kg/tree for the Red Velox variety (SRL „Prodcar”) to 22.4 kg/tree for the variety Gala Buckeye Simmons (SRL „Elit Fruct”). In the 6th year after planting, the harvest again decreased considerably in both households and varies from 4.3 kg/tree for the Red Velox variety (SRL „Elit Fruct”), up to 8.8 kg/tree for the Gala Buckeye Simmons variety (SRL „Prodcar”). The apple plantation of SRL „Prodcar” also bore fruit starting from the 2nd year after planting, but with a lower yield compared to the plantation of SRL „Elit Fruct”.

Acknowledgments: This study was supported by the National Agency for Research and Development of the Republic of Moldova, project 18.817.05.29A „Improving maintenance technologies of super-intensive cherry and apple orchards, developing techniques for training fruit quality on a European level”. Project director, Doctor Habil. , university professor, Valerian BALAN.

Keywords: *apple variety, plantation, productivity.*

PREVENTIVE EVALUATION OF DROUGHT RESISTANCE OF APPLE VARIETIES AND HYBRIDS

Bucarcine Victor, Cozmic Radu

*Public Institution Scientific-Practical Institute of Horticulture and Food
Technologies, Chisinau, Republic of Moldova
E-mail: victorfilip.20@gmail.com*

In 2020, the central area of the Republic of Moldova was subjected to a terrible drought. The collection was established in the years 2007-2009, M26 rootstocks, and the selection orchard in the years 2009 - 2011 with planting distances of 4 x 1.5 and 4 x 0.75m, respectively. The 1878 hybrid plants and 203 cultivars, species and elites including 162 genotypes with genetic resistance to apple radish and 41 non-resistant were observed. The assessment of the reaction of the plants was carried out by scoring according to the scale 1-6 where: - 1 – no attack ... 6 - very strong attack, over 80% of the leaves have fallen and the rest are yellow, wilted and twisted. Precipitation in 2019-2020, in the months of October-April, was 60% less than normal. Average monthly temperatures between October 2019 and September 2020 were 3-5% higher. The observations were carried out between September 17-23, 2020 until the rains intervened. Data processing was performed in Excel using one-way analysis of variance without repetitions with the determination of partial differences between hybridization combinations and the level of heritability, H²%. A very weak reaction was observed in the trees of the Dalinred, Florina and Corelita varieties, weak in Nova Easygro and Generos, medium in the trees of the Priam and Dalinbel varieties and strong in Goldrush, Coredana, Coredar and Romus 2.

Hybrids of paternal varieties with genetic resistance to turnip Goldrush, Coredar, KV43, Coredana and Priam indicated medium drought attack and of paternal parental forms Rosyglow, Rubinola, Dalinbel, Ariane and non-resistant Granny Smith Spur, 1-11(6-10), Trident, Champion, Red Idared and Golden Delicious were heavily attacked by the drought.

According to the coefficient of heritability, H², which in the analyzed hybrid combinations varies between indices 41.4 and 60.5%, there is the possibility of choosing the most suitable genotypes for the purpose of subsequent hybridizations for the creation of new varieties less affected by drought.

Acknowledgments: This study was supported by the research project of the State Program (2023) with the number 20.80009.5107.14 „The use of modern genetic and biotechnological methods in order to create, develop and implement in production varieties of fruit crops, rootstocks and baciferous cultures, with increased biological potential” (contract with ANCD no. 53-PS of February 2020), funded by the National Agency for Research and Development.

Keywords: *analysis of variance, difference, drought, genotype, heritability, resistance, variety.*

CZU: 634.232: 631.811.98

THE UTILIZATION OF THE GROWTH REGULATOR PACLOBUTRAZOL IN SWEET CHERRY ORCHARDS

Buză Corneliu

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: buza_cornel@mail.ru

Around the globe, sweet cherries (*Prunus avium L.*) orchards occupy more than 440 thousand hectares and produce almost 2,3 million tons per year. In the Republic of Moldova, sweet cherry orchards occupy 4100 hectares and produce more than 10 thousand tons per year. Sweet cherry trees are of great economic importance due to the nutritional, technological and commercial value of their fruit.

The researches have been carried out in the central fruit growing zone of the Republic of Moldova, in Ustiya „Star Agro Groop” LLC in the district of Criuleni. The orchard was planted with the Kordia, Regina, Stella, Ferrovia and Skeena varieties, grafted on Maxma 14 rootstocks. The trees were planted in the autumn of 2012 at a distance of 5 x 3 m, using trees with naturally improved reduced volume crowns. The effect of the growth regulator Paclobutrazol applied to the soil around tree trunks was assessed. The amount of 1, 2 and 3 ml was mixed with 500 ml of water and poured onto the soil around trunks in a circular strip to a depth of 3-5 cm. The experiments included 4 groups of 3 trees each. The Paclobutrazol (PP333), a plant growth retardant called *antigibberellin*, is widely used to retard growth and to improve flowering in fruit plants. As a result, a shoot with the same number of leaves and internodes is of a shorter length. The period and rate of the Paclobutrazol application influenced the time and intensity of flowering and fruit harvest. The rate of a growth regulator utilization affects the yield per tree and per unit area. The yield of the Cordia, Regina, Stella, Ferrovia and Skina varieties, grafted on Maxma 14 rootstocks, was high in this case. The positive effect was manifested by reducing the growth of annual branches and increasing the number of fruits with a diameter of 28 mm or larger, without affecting the overall yield.

The work was part of a strategic priority relating to sustainable agriculture, food security and food safety, namely the development and implementation of modern technologies which are a way to increase the productivity of cherry orchards by maintaining a balance between growth and fruiting. The growth regulator Pacloburazol reduces the vegetative growth of trees.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: *growth regulator, sweet cherry, sweet cherry variety, sweet cherry rootstock.*

CZU: 634.232:631.526.32(478):

THE POMOLOGICAL CHARACTERISTICS OF THE MAIN SWEET CHERRY TREE VARIETIES GROWN IN THE CENTRAL AREA OF THE REPUBLIC OF MOLDOVA

Buză Corneliu

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: buza_cornel@mail.ru

In the Republic of Moldova, the sweet cherry tree (*C. avium*) is one of the priority species the fruit of which are in demand on the domestic and foreign markets. In 2022, 37 varieties and 10 promising varieties were registered in the Plant Varieties Catalog. The approved range has made it possible to use intensive systems for establishing and maintaining new sweet cherry orchards at optimal density and with large and cost-effective yields.

The most productive sweet cherry cultivars and rootstock varieties used in modern cherry fruit production were studied. The vegetative rootstocks are uniform. They reduce tree growth rates, induce precocity, and allow fruit growers to harvest superior quality fruit in modern, high-density orchards. In the cultivation of sweet cherry trees, vegetative semi dwarfing (Gizela 5), semi-vigorous (Gizela 6, P HL-S, Krymsk 6), moderate vigorous (Krymsk 5, Maksma 14, Piku 1, Gisela 12) and vigorous (Colt, Maxma 60) rootstocks are used, which has recently received special attention in our country. The Ferrovia, Early Star (self-fertile) and Black Star (self-fertile) varieties are of moderate vigor with spreading crowns. They begin to bear fruit in the 5-6th year after planting, mainly on fruiting and middle-sized branches; they have medium and high unstable productivity. The Royal Helen, Stella (self-fertile), Skeena (self-fertile), Summit and Sweet Heart (self-fertile) varieties are of medium-high growth vigour with a well-rounded spherical crown, which bear fruit mainly on fruiting branches, and have high and constant productivity. The Folfer and Ferdous are of moderate to high vigor, have high branching capacity, high productivity and moderate crack resistance. Horticulturists prefer the Kordia and Regina (varieties. Moderate vigorous trees (Cordia) and vigorous trees (Regina) with spherical crowns bear fruit on fruiting and medium-sized branches and have high, unstable productivity. Their fruit ripen in the last ten days of June and early July. In modern fruit growing, the cherry growing system provides for the introduction of self-fertile varieties and vegetative rootstocks with a simple crown shape, which allow for full use of the nutrient space provided to the trees, early fruiting, high-quality and efficient harvesting, the mechanization of technological processes and the increased labor productivity during care and harvesting.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: *sweet cherry tree growth, sweet cherry variety, sweet cherry rootstock.*

INFLUENCE OF FRUIT LOAD THINNING METHOD ON SPECIFIC PRODUCTIVITY OF APPLE TREES

Calestru Oleg, Peșteanu Ananie

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: oleg.calestru@gmail.com

Tree specific productivity is the fruit yield in relation to crown canopy area, crown productive volume and cross-sectional area of the trunk. The researches were carried out in the orchard of the company LLC „Codru ST” in the period of 2014-2017, age of trees 9-12 years, varieties Gala Must, Golden Delicious Reinders, Idared, grafted on M9, planting distance 3.5x1.2 m, crown shape improved slender spindle. As methods of fruit load regulation, control variant without thinning, hand thinning variant and chemical thinning of fruit were used. For chemical thinning 3 growth regulators with different treatment basis were used: Geramid New (1.2; 1.5; 2.0 l/ha), Dirager (0.2; 0.3; 0.4 l/ha) and Gerba 4LG (2.0; 2.5; 3.0 l/ha).

The absolute values of this indicator contain information about the degree of use of the projection area, which must be in favor of fruit production. The specific fruit yield is in direct correlation with the biological particularities of the variety and the method of regulation of the fruit load used during fruit thinning. Higher values of fruit production were obtained in the Idared variety, where the fruit load was higher and the parameters of plant structure and cross-sectional area of the trunk lower. Gala Must and Golden Reinders varieties characterized by lower yield values and higher values of plantation structure had lower results.

The method of regulation of the fruit load has considerable influence on the indices taken in the study. In the variants with chemical thinning, similar values of the indices studied with the manual thinning variant in the variety Gala Must were recorded in the variants treated with the products Geramid New, 1.2 l/ha; Dirager, 0.3 l/ha; Gerba 4LG, 2.5 l/ha. For Golden Delicious Reinders, priority was given to the variants where the growth regulators Geramid New, 2.0 l/ha; Dirager, 0.4 l/ha and Gerba 4LG, 2.5 l/ha were applied. In the case of Idared, which is considered to be an easy to cool cultivar, higher values of specific productivity were recorded when the dose of the product applied to the treatment was minimal (Geramid New, 1.2 l/ha, Dirager, 0.2 l/ha, Gerba 4LG, 2.0 l/ha).

The specific productivity of the trees is in direct correlation with the bioconstructivi parameters of the varieties, the method of regulation of the fruit load and the applied dose of product per unit area.

Keywords: area, projection, specific production, thinning, volume.

PERSPECTIVE OF CULTIVATION OF GRAFTED PLUM VARIETIES ON MIROBALAN 29C IN THE SOUTHERN AREA OF THE COUNTRY

Cumpanici Andrei, Peșteanu Ananie

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: andrei.cumpanici@tpa.utm.md

The researches were carried out in a plum plantation during 2021 established in 2015 in the southern part of the country, SRL „Agroparc Management”. In the research, the Stanley (control), Top Star, Blue Free, President and Tophit varieties were grafted on the Mirobalan 29C rootstock, and the Stanley and President varieties on the corcodus biotype. The planting distance of the trees between the rows is 5.0 m, and between the trees in a row 3.0 m.

A smaller number of fruit formations were formed by the President variety - 605 pcs/tree, and the largest by the Tophit variety - 915 pcs/tree. To the group of medium varieties, weighing between 30-40 g, the Stanley variety is assigned, whose average weight was 39.7 g. The Top Star variety (41.3 g) is assigned to the group of those with large fruits, whose weight fall within the values of 40-50 g. The varieties with very large fruits include Blue Free (51.2 g), President (51.3 g) and Tophit (62.2 g), whose average fruit weight was greater than 50 g.

According to the weight of the stone in the fruit, the plum varieties studied can be divided into 2 groups. To the group of varieties with the weight of the stone in the fruit up to 5.0%, the Blue Free (4.2%), Tophit (4.5%) and President (4.6%) varieties are attributed, and the Stanley varieties (5.6%) and Top Star (5.8%), recorded a higher share of the stone in the fruit, placing themselves in the group from 5.0 to 6.0%. Lower values of the number of plums in the crown of the trees on the Mirobalan 29C rootstock was formed within the Tophit variety - 214 pcs/tree. Next, the varieties Top Star - 310 pcs/tree, President - 370 pcs/tree, Blue Free - 410 pcs/tree were placed on the increase. The Stanley variety recorded higher values, constituting 605 pcs/tree. Smaller fruit production from a tree on the Mirobalan 29C rootstock was recorded for the Tophit variety - 13.3 kg/tree, then the Top Star varieties - 14.4 kg/tree, President - 19.0 kg were placed /tree, Blue Free – 21.0 kg/tree and Stanley (m) – 23.7 kg/tree. Higher values of fruit production per surface unit were obtained in the Stanley variety - 15.8 t/ha, and lower in the Tophit varieties - 8.9 t/ha and Top Star - 9.6 t/ha. The President and Blue Free varieties recorded average values, constituting 12.7 and 14.0 t/ha, respectively.

Acknowledgments: This study was supported by the NARD of the Republic of Moldova, project 20.80009.5107.04 „Adaptation of sustainable and ecological technologies of fruit production under quantitative and qualitative aspect according to the integrity of the culture system and climate changes”. Project director, Doctor Habil. , university professor Valerian BALAN.

Keywords: *fruit, plum, production, varieties.*

RESULTS OF TESTING BIOINSECTICIDE METAWHITE AGAINST SOIL PESTS OF SUNFLOWER

Croitoru Nichita, Pănuța Sergiu

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: nichita.croitoru@spp.utm.md

Sunflower is often susceptible to attack by a wide range of pests and diseases, which in some years can significantly reduce the yield of this crop. A fundamentally different method of limiting the number of insect pests is the use of bioinsecticides based on entomopathogenic microorganisms. Most of the bioinsecticides currently produced are designed to control leaf-eating insects. Information on the effect of these preparations on soil pests, in particular on polyphagous ones, is extremely scarce.

Research work on testing the drug Metawhite was carried out in 2020, on the sunflower fields of the agricultural company SRL „Bardar-Agro”, Bardar, Ialoveni district. The soil was treated with various doses of Metawhite before sowing, on April 16, 2020.

The field plot experiment was carried out in quadruple repetition. The plot size is 10 rows with a distance between rows of 0.7 m and a row length of 10 m. Thus, the area of one plot was 70 m².

The experiment included four variants: 1st variant- control, without treatments; 2nd variant Metawhite insecticide with a consumption rate of 5.0 l/ha; 3rd variant Metawhite insecticide with a consumption rate of 10.0 l/ha; 4th variant Metawhite insecticide with a consumption rate of 15.0 l/ha. Throughout the study period, treatments were carried out manually using a portable backpack mechanical sprayer. To comply with the principle of single difference and to avoid side effects, treatments were carried out on the same day, in the morning.

In order to determine the most suitable field and place for establishing a field experiment, and to determine the phytosanitary condition, we carried out observations in early April. In the spring, 9 types of pests and four types of beneficial insects were identified in fields sown with sunflower. Of the pests in the adult phase, 4 species of insects were identified, the number of which varied from 0.5 to 2.0 exemplars/m².

Beneficial fauna was represented by adult from the g. *Pterostichus* (*P. cupreus*, *P. niger*). In this regard, the purpose of this study was to study the biological effectiveness of the microbiological preparation Metawhite in the control of soil pests on sunflowers. In the fight against soil pests, the most effective preparation is Metawhite with a consumption rate of 10.0-15.0 l/ha, which provides a reduction in soil pests at the level of 81.82 – 94.74% and a reduction in the number of damaged plants at the level of 83.33 – 91.30%.

Acknowledgments: The research program was carried out within the technical-scientific collaboration contract no. 3/2020 regarding the testing of phytosanitary products.

Keywords: *apple orchards, bioinsecticide, biological and control particularities, elateridae, larvae, Scarabaeidae, sunflower.*

EFFICIENCY OF PROGERBALIN LG AND GERBA 4LG PRODUCTS ON THE BRANCHING OF M9 TREES IN TREE NURSERIES

Gaberi Valentin, Pesteanu Ananie

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ananie.pesteanu@h.utm.md

In order to determine the influence of variety and different intervention techniques on the degree of emission of anticipated shoots the following variants were tested: 1. Free growing (control); 2. Progerbalin LG, 25 ml; 3. Progerbalin LG, 25 + 25 ml; 4. Progerbalin LG, 25 ml + topping of apical leaves; 5. Progerbalin LG, 25 + 25 ml + topping of apical leaves; 6. Gerba 4 LG, 25 ml; 7. Gerba 4 LG, 25 + 25 ml; 8. Gerba 4 LG, 25 ml + topping of apical leaves; 9. Gerba 4 LG, 25 + 25 ml + topping of apical leaves.

Lower values of tree height of Gala Schniga SchniCo Red variety were recorded in the control variant (177 cm) compared to the other variants taken in the study (184-210 cm). The results obtained demonstrate an influence of the products taken in the study on the given index and there is a general tendency that in the variants where the apex was intervened by different methods the tree height was 4.0-18.6% higher compared to the values recorded in the control variant.

The average length of the early branches recorded on Gala Schniga SchniCo Red varied on the variants under study from 27.0 to 54.5 cm and is in direct correlation with the number of early branches formed in the crown formation zone on the stem. Comparing the action of the product on the studied index we register a greater length of annual branches in the variants where the product Progerbalin LG was applied (39.7-54.5 cm) compared to those treated with the growth regulator Gerba 4 LG (34.9-40.5 cm). Higher values of the index in the study were scored in the varieties treated with the growth regulators Progerbalin LG and Gerba 4 LG at the dose of 25 + 25 ml/liter water, where the total length of annual branches was 374 and 316 cm, respectively. The results obtained allow us to conclude that a more favorable balance between tree growth indices and crown base formation in field II of the nursery was recorded in the variants where the growth regulators Progerbalin LG and Gerba 4 LG were applied twice at a dose of 25 ml/liter. The first application to be carried out when the height of the stem is 65-70 cm high and the second at an interval of 5-7 days after the first treatment.

Acknowledgments: This study was supported by the NARD of the Republic of Moldova, project 20.80009.5107.04 „Adaptation of sustainable and ecological technologies of fruit production under quantitative and qualitative aspect according to the integrity of the culture system and climate changes”. Project director, Doctor Habil. , university professor Valerian BALAN.

Keywords: *anticipated shoots, apples, branches, growth regulator.*

**THE IMPACT OF ANNUAL CANES REGULARIZATION ON THE
PRODUCTIVITY AND QUALITY OF FLORICANE VARIETY
„PRZEHYBA”, GROWN IN THE OPEN FIELD AND
GREENHOUSE**

Dodica Dmitri

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: dcberrygroup@gmail.com

The research has been carried out in the Central part of the Republic of Moldova, namely at the „Nasu Vasile” Farm founded in 2012. The object of the research was the raspberry plants of Przehyba variety, in the 1st and 2nd year of fruiting, cultivated in the open field and the greenhouse. The research has been carried out during period of March 2022 - August 2023, in the Central part of Moldova, Soldanesti city, planting made in 2021. The planting distances used in both plantations are of 2.3 m between rows and 0.45 m between plants per row. The density of two years canes established in those 4 variants was 8 plants per linear meter. The comparison of the obtained results was carried out by classifying the experiences in 4 variants. The investigations carried out highlighted the fact that in option 1, the year 2023, we obtained the best result of the 4 research experiences, where 288 fruits were harvested from one plant, followed by option 2, the year 2023 of fruiting with 252 fruits total harvested. The least fruits were obtained in variant 4, the year 2022 and 2023, 120 fruits in each variant from the research.

The better fruit size has been got in greenhouse than those obtained in open land. Also, following the organoleptic analysis, sunburn signs was observed on the raspberry fruits, in variant 1, 3 and 4, year 2023, which influenced the marketable qualities of the product. The highest percentage of dry matter/Brix was obtained from the fruits harvested from open field, year 2023, the lowest percentage were obtained from the fruits harvested from the greenhouse, 2022 year. If we make a mathematical calculation of the production volumes obtained in those 4 researched variants, at 1 ha area, we could potentially obtain 20.7 tons of raspberry fruits grown in greenhouse. In open field we could get 12 tons of raspberries, with a density of 8 suckers per linear meter. In 2023, the average purchase price of fresh raspberries from the field, the „Przehyba” variety, was 60 lei/kg, which is de facto 1.24 million lei sales revenue for raspberries grown in protected land, and in the variant of raspberry cultivation in open ground could be obtained a potential income of 0.72 mln. lei/ha.

Acknowledgments: This study was supported by ANCD, project number 20.80009.5107.04 „Adaptation of sustainable and ecological technologies of fruit production in quantitative and qualitative aspects depending on the integrity of the culture system and climate changes”. Project Director, Doctor Habil. , university professor, Valerian BALAN.

Keywords: *raspberry, sucker, sucker rationalization.*

DEVELOPMENT OF CHERRY ROOT SYSTEM ON DIFFERENT TYPES OF ROOTSTOCKS

Manziuc Valerii, Fedorciucov Iliia

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: valerii.manziuc@h.utm.md

The experimental orchard for the study of different types of rootstocks was planted in spring 2016 in the northern zone of the Republic of Moldova with annual seedlings of cherry varieties Kordia and Regina. Two types of rootstocks were studied: Gisela 6 and Antipka, which served as a control. Cherry trees were formed according to the free-growing spindle type. The planting scheme of trees grafted on Antipka - 4 x 3 m, on Gisela 6 - 4 x 2.5 m. The orchard is irrigated. Analyzing the data on the length and weight of roots, it should be noted that at the age of seven years, the highest values of this indicator were observed in the Gisela 6 rootstock, which exceeded the Antipka rootstock by 35.2% in terms of total length in the Kordia variety. Thus, in the variety Kordia by weight it amounted to 88%, while in this variety grafted on Gisela 6, it was only 79%. In general, the root system of Gisela 6 rootstock is characterized by greater branching and a higher percentage of active roots with a diameter of less than 3 mm. Analyzing the distribution of roots by soil horizons, it should be noted that the greatest value of the length and weight of roots for the studied rootstocks was registered in the soil layer 20-40 cm. Thus, in the variety Cordia on the rootstock Gisela 6, 27.2% of the total length of roots is concentrated in this horizon. In terms of root mass, the values of this horizon are even greater. The second in importance is the surface soil layer 0-20 cm, which accounts for about 26% of the root length, and the third horizon 40-60 cm - about 23%. It also draws attention to the fact that in Gisela 6 a rather significant part of roots is located in the horizon 40-60 cm, while in Antipka, the mass of roots in this horizon was 2 times less. With depth the mass of roots gradually decreases and in horizons 60-80 cm and 80-100 cm their share is 10-12%. The studies have shown that the rootstock has a significant effect on the power of distribution of the root system of cherry. Despite the weaker development of the above-ground part of trees grafted on the Gisela 6 rootstock compared to Antipka, the root mass of trees grafted on its varieties Kordia and Regina was, on average, by 13%, and the length by 34% more. In the root structure of Gisela 6 rootstock, the main share - 77.5% - is accounted for by lobe roots with a diameter of less than 1 mm. The roots of this rootstock evenly develop the thickness of the soil horizon up to 60 cm deep, where up to 76% of the total root length is concentrated.

Acknowledgments: This study was supported by the NARD of the Republic of Moldova, project 20.80009.5107.04 „Adaptation of sustainable and ecological technologies of fruit production under quantitative and qualitative aspect according to the integrity of the culture system and climate changes”. Project director, Doctor Habil. , university professor, Valerian BALAN.

Keywords: *cherry, placement in the soil, rootstocks, roots.*

GROWTH AND DEVELOPMENT OF DIFFERENT SPINACH VARIETIES

Novac Tatiana¹, Iliev Petru²

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Public Institution Scientific-Practical Institute of Horticulture and Food Technologies, Chisinau, Republic of Moldova*

E-mail: tatiana.novac@h.utm.md

Spinach (*Spinacia oleracea*) is a member of the *Chenopodiaceae* family. Spinach is a low growing fleshy leaved annual that forms a heavy rosette of either smooth or wrinkled leaves. Spinach varieties are classified by leaf types: savoy (wrinkled), semi – savoy and flat. Savoy and semi-savoy are used for fresh markets, while smooth (flat) types are used for baby spinach.

The aim of the study was to determine the growth, development and productivity of some spinach varieties. Objects of study: a) Spinach hybrids – Clipper F1 (C); Mercat F1; Spinach varieties – Matador and Victoria. Clipper F1 served as a control because it is the only hybrid registered in the Register of Plant Varieties of the Republic of Moldova. An important indicator of the quality of spinach production is the external appearance of the plant, which is characterized by: the number of leaves formed in the rosette, the intensity of the color of the leaves, the shape of the leaves, the degree of roughness of the leaves. Consumers have a higher preference for spinach varieties with a large number of leaves, a dark green color of them, with a thicker leaf blade, with a longer petiole of the leaves to facilitate mechanized harvesting of the plants.

The period from sowing to emergence, varied insignificantly depending on the variety, being of 9-10 days. Spinach is one of the crops with the earliest maturation, according to the ripening conditions the studied spinach varieties can be divided into two groups: up to 30 days (V1-Mercat F1) and 31–35 days (V1-Clipper F1 -32 days; V3-Matador – 33 days; V4-Victoria – 35 days). In the experience were not varieties with a vegetation period longer than 35 days.

The highest average production was obtained with the variety Matador being 2.1 kg/m², and the lowest production was obtained with the Victoria variety being of 1.6 kg/m². High productivity was also recorded at the hybrids Clipper F1 and Mercat F1 with productions of 1.9 kg/m² and respectively 1.8 kg/m².

Spinach being a susceptible species to the photoperiod (duration and intensity of light), very quickly in long day conditions forms the floral stem, to the detriment of the quality of the leaves. It was identified that at the age of 60 days after sowing, a more pronounced increase in the length of the aerial part is evident to Mercat F1 hybrid. This increase in the height of the internodes of the plant can be argued by the fact that, being an earlier variety, it is obliged by its genetic characteristics to reach faster maturity.

Keywords: leaves, productivity, spinach, varieties, vegetation period.

EFFICIENCY OF SOME PRODUCTS CONTAINING ACETAMIRPID 200 G/L, AS INSECTICIDES AGAINST WHEAT PESTS

Panuța Sergiu

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: sergiu.panuta@spp.utm.md

In the Republic of Moldova, as in many European countries, wheat is the main food crop. A set of measures should be directed against reducing the density of various types of pests. Natural populations of parasitic and predatory entomophages play a significant positive role in reducing the number of pests. In the climatic conditions of the Republic of Moldova, more than ten species of bugs are found in the winter wheat crop. The most common are three species of the genus *Eurygaster* (*E. integriceps*, *E. maura*, *E. austriaca*), and two species of the genus *Aelia* (*Aelia acuminata* and *Aelia rostrata*). Of the aphids, the most common species are *Schizaphis graminum* Round and *Sitobion avenae* Fabr. A range of thrips species from various genera can be found in cereal crops, such as: *Haplothrips tritici* Kurd., *Haplothrips aculeatus* Fabr., *Stenothrips graminum* Uzel, *Limothrips denticornis* Hal, *Fransliniella intosa* Tryb, *Anaphothrips obscurus* Mult, *Chirothrips manicatus* Hal. In order to reduce the pests, the chemical control method is applied, which requires constant study. The purpose of the current research was to study the biological efficiency of the insecticide containing acetamiprid, 200 g/l, in combating wheat pests. The experiences were carried out in the year 2022, in the fields with winter wheat, in the company SRL „Agro-Papuros”, in Marandeni, Falesti district. Based on the evidence and preventive observations, carried out in the 3rd decade of May, it was found that in the straw formation phase and the beginning of threshing, the economic threshold was exceeded by wheat trips, leaf lice and grain bugs. The number of trips, before the start of the treatment, varied from 18.17 exemplars per plant - in the control variant, to 20.74 - in the 4th variant. Based on the experiments carried out before the chemical treatment, it was found that the numerical value of bed bugs varied from 3.95 exemplars/m², in the 3rd version, to 4.70 - in the 4th version. In the 2nd decade of May during the straw formation and sprouting phase, parallel to the wheat trips, the economic damage threshold was also exceeded by aphids. Until the chemical treatment, the numerical value of aphids was from 19.19 ex/plant, in the 3rd variant, to 22.74 ex/plant in the control variant. Chemical treatment with the preparation containing acetamiprid, 200 g/l, with application rate of 0.17 kg/ha + 0.1 L/ha Active Max (SAS), ensured the control of *Haplothrips tritici* Kurd. (96.19 – 93.99%), *Eurygaster integriceps* Put. (98.48 – 96.75%), *Schizaphis graminum* Round (97.65 – 94.55%) during 10 - 12 days after treatment.

Acknowledgments: The research program was carried out within the technical-scientific collaboration contract no. 3/2022 regarding the testing of phytosanitary products.

Keywords: *biological and control particularities, Eurygaster integriceps Put., insecticide, Haplothrips tritici Kurd., Schizaphis graminum Round, wheat.*

CZU: 634.11:632.951(478)

EFFICIENCY OF SOME INSECTICIDES BASED ON THE ACTIVE SUBSTANCE LAMBDA-CYHALOTRIN 50 G/L, IN THE CONTROL OF APPLE TREE PESTS, IN THE CONDITIONS OF THE REPUBLIC OF MOLDOVA

Panuta Sergiu, Croitoru Nichita

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: sergiu.panuta@spp.utm.md

In the apple plantations of the Republic of Moldova, out of 7 species of tortricidae, the most common species in recent years is the reticulated tortrix which develops two generations a year. The larvae of this species damage blossoming buds, leaves, buds, flowers and fruits. Of the fruit pests, the most dangerous is the codling moth, which also develops two generations a year. The aim of the present studies was to investigate the biological efficacy of two doses of insecticide Samum EC, against apple pests. As a result of chemical treatments in the fourth variant, the number of larvae per 100 buds and per 100 leaf rosettes was 0.35 and 0.49 exemplary, respectively.

Accounts of fruit damage made it possible to establish that, in the fourth variant, both in the tree crown and among fallen fruits, the percentage of damaged reticulated tortrix was 0.47 and 0.59%, respectively, and damage to leaves and buds was 0.48 and 0.60%.

The level of reduction in damage to buds and leaves in the fourth variant was 92.92 and 88.49%, respectively, and is significantly higher than the third variant. In the third variant, the level of reduction in fruit damage is significantly lower, being at the standard level and inferior to the 4th variant.

It is well known that in the fight against codling moth larvae, the importance to correctly determine the beginning of the hatching of larvae and carry out chemical treatments at the optimal time. During the 2021 research period, pheromone traps were used.

Throughout the growing season, fruits were collected once at every five days and were analyzed for the presence of damaged codling moths. The last count was made the day before the start of the harvest, after which the total number of fallen fruits was counted, including those damaged by larvae of codling moth. Before harvesting, the number of damaged fruits in the harvested crop was taken into account. The main criterion for determining biological effectiveness is the level of reduction in fruit damage in comparison to the control variant.

The results of calculating the reduction in the number of damaged fruits in comparison with the control showed that, both in general and in the harvested harvest, the best results were obtained in the fourth variant (97.37 - 92.29%). The most effective insecticide in the control of reticulated tortrix and codling moth is Samum EC, with a consumption rate of 0.8 l/ha.

Acknowledgments: The research program was carried out within the technical-scientific collaboration contract no. 3/2021 regarding the testing of phytosanitary products.

Keywords: *Adoxophyes orana F.*, *apple orchards*, *biological and control particularities*, *Cydia pomonella L.*, *insecticide*, *Tortricidae*.

CZU: 634.11:631.54

REGULATION OF FRUIT LOADERS IN APPLE ORCHARDS DECISIVE TECHNOLOGICAL ELEMENT TO INCREASING FRUIT QUALITY

**Peșteanu Ananie, Cimpoiș Dragoș, Cumpanici Andrei, Calestru Oleg,
Racul Anatol**

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ananie.pesteanu@h.utm.md

The researches were carried out in the orchard of the company Ltd. „Codru ST” during 2014-2017, age of trees 9-12 years, varieties Gala Must, Golden Delicious Reinders, Idared, grafted on M9, planting distance 3,5x1,2m, crown shape improved slender spindle. For chemical thinning 3 growth regulators with different treatment basis were used: Geramid New (1.2; 1.5; 2.0 l/ha), Dirager (0.2; 0.3; 0.4 l/ha) and Gerba 4LG (2.0; 2.5; 3.0 l/ha).

Higher values of the given index during the research were scored in trees of Idared variety (170.3 g) compared to those of Golden Reinders (161.0 g) and Gala Must (154.8 g).

The largest fruit diameter in the years of research in the hand thinning variant was obtained in Idared (75.8 mm) compared to Golden Reinders and Gala Must, where the index in the study was 71.1 and 71.9 mm respectively.

The method of fruit load regulation influenced fruit diameter. The control variant, without thinning, recorded lower values, constituting in 2014, in the fruit of Gala Must 57.2 mm, Golden Reinders 54.3 mm and in the trees of Idared 64.3 mm. This legality was also recorded in 2016. In 2015 and 2017 in the given variant, the average fruit diameter within trees of Gala Must and Idared varieties as a result of the very small number of fruits recorded very high values (75.0-86.6 mm), which are more difficult to market.

Higher values of the index in the study, in trees of the Golden Reinders variety, were recorded in the variants Geramid New 2.0 l/ha, where fruits of the „Extra” category accounted for 58.2%, category I - 33.6% and category II - 8.2%. In the variants Dirager 0.4 l/ha and Gerba 4LG, 2.5 l/ha the studied index obtained identical values as in the previous variant, constituting 55.6; 32.5; 11.9 and 59.2; 30; 7.8%

In the other variants, the commercial qualities of the fruit were lower than in the variants mentioned above and only in the Gerba 4LG variant, 3.0 l/ha, higher values were recorded (category „Extra” - 63.9%; category I - 31.7%; category I - 31.7%; category II - 4.4%).

The obtained results allow us to conclude that the commercial quality of the fruit was influenced by the biological peculiarities of the variety and the way of regulating the fruit load.

Keywords: area, projection, specific production, thinning, volume.

BEHAVIOUR OF SOME VARIETIES OF APRICOT FROM DIFFERENT SELECTION CENTRES GRAFTED ON MYROBALAN 29C IN THE SOUTHERN PART OF THE COUNTRY

Pesteanu Ananie¹, Negru Ion²

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Timac Agro East SRL, Chisinau, Republic of Moldova*

E-mail: ananie.pesteanu@h.utm.md

Trees of the studied varieties of apricot were grafted on the rootstock Mirobalan 29C. The trees were planted in the southern part of the country in 2015 in the company SRL „Agroparc Management” campaign, at 5.0 m row spacing and 3.0 m per row, at a density of 667 trees/ha. The research was carried out during 2022.

The lowest values of fruit height were recorded in the varieties Lilly Cot (37.0 mm) and Kioto (m) (37.6 mm), and the highest in the varieties Wonder Cot (53.3 mm) and Magic Cot (53.8 mm). In general, all the studied varieties can be divided by fruit height into 3 groups.

The lowest values of fruit height were recorded in Lilly Cot (37.0 mm) and Kioto (m) (37.6 mm) and the highest in Wonder Cot (53.3 mm) and Magic Cot (53.8 mm). In general, all the studied varieties can be divided by fruit height into 3 groups. That is, the varieties with fruit height 35-40 mm Lilly Cot and Kioto (m) are assigned to the first group. In the second group, the varieties Big Red, Sweet Cot, Spring Blush, Perle Cot, Orange Red, Pinkcot, Faralia and Farbaly with fruit height of 40-50 mm can be placed. Values higher than 50 mm were recorded for the studied varieties Wonder Cot and Magic Cot.

According to the proportion of stone in the fruit, the studied apricot varieties can be divided into the following groups. In the group of varieties with a stone weight of 3.0-5.0%, the varieties Perle Cot (4.1%), Pinkcot (4.4%), Wonder Cot (5.0%) and Big Red (5.0%) can be assigned. In the group with a stone weight of 5.0-7.0%, the varieties Magic Cot (5.2%), Sweet Cot (5.9%), Orange Red (6.0%) and Lilly Cot (6.8%) can be assigned. In the group of varieties with a kernel-to-fruit ratio of more than 7.0% are Kioto (7.2%), Spring Blush (6.0%), Farbaly (10.2%) and Faralia (10.7%).

Higher overall apricot production values were obtained in Pinkcot (10.00 t/ha) and Kyoto (10.36 t/ha), lower were in Big Red (9.60 t/ha) and Faralia (9.73 t/ha). Next in descending order were Sweet Cot (9.20 t/ha), Farbaly (8.72 t/ha), Perle Cot (8.70 t/ha), Lilly Cot (8.45 t/ha), Wonder Cot (6.44 t/ha), Spring Blush (6.40 t/ha), Magic Cot (5.40 t/ha) and Orange Red (4.36 t/ha).

Acknowledgements: This study was supported by ANCD, project 20.80009.5107.04 „Adaptation of sustainable and environmentally friendly fruit production technologies in terms of quantity and quality in relation to cropping system integrity and climate change”. Project director, Doctor Habil., university professor, Valerian BALAN.

Keywords: *apricot, fruit, productivity, weight.*

CZU: 634.22:581.145

INVESTIGATION OF PLUM REPRODUCTIV SYSTEM DEVELOPMENT RELATED TO BIOTEHNOLOGICAL APPLICATIONS

Pintea Maria

*Public Institution Scientific-Practical Institute of Horticulture and Food
Technologies, Chisinau, Republic of Moldova*

E-mail: mariapintea@yandex.ru

As a result of preventive investigation and pomological evaluation of plum (*Prunus domestica* L.) within variable micro-climatic conditions of Republic of Moldova where selected for biotechnological experimentations 4 varieties (Udlinenaia and Super President, created in RPIHAT), as well as Stanley and President (introduced) with late fruits maturation. Scope experimental investigations there are fresh plum fruits capacity of prolongation preservation period within controlled conditions. Biologic stimulator and experimented microelements (Reglal and complex of microelements (B, Zn, Mn, Mo), as well as CaCl₂ where applied during intensive leaves growing, initial period of fruit development and within the final stage of fruits pulp development. There was evaluated favourable influence regarding flower bud initiations, as well as integral development of reproductive system.

As a result of 3 early repeated treatments there where noticed growth of resistance to droughts conditions, including qualitative heterogeneity of flower structures development during winter and spring periods, flowering processes (quality of pollen and embryo sac development, efficient period of pollination). As well as there where noticed a better correspondence of flowering and pollination of introduced varieties with registered ones for industrial culture in the frame of Rep. Moldova. But the most important results there are reflected on stimulated quantity and qualities of developed late plum varieties, needed for prolongation of future preservation.

There what it is possible to concluded that noticed biotehnoological applications there are important for stable homeostasis manifestation during whole period of reproductive structures development, including fruits formation.

Acknowledgments: This study was supported by the research project (IGFPP- IȘPHTA-184/23.10.19 „Targeted formation of the quality of the immune system in fruit of late plum varieties intended for long-term storage”), funded by (ANACED, Rep. Moldova, 2020-2023 y.).

Keywords: *plum, microelements, Reglal, reproductive system, Republic of Moldova, varieties.*

SWEET CHERRY TREE SHAPING, PRUNING AND FRUITING

Russu Stanislav

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: stanislav.russu@doctorat.utm.md

Sweet cherry trees constantly bear fruit, are adapted to environmental conditions, produce high-quality fruit that are in demand on the market, and are easy to care using modern technologies. In modern fruit growing, it is recommended to use intensive systems for growing sweet cherry trees grafted on rootstocks of medium vigor (Maxima 14, Gisela 6) at a planting distance of 4-5x2-3 m or on dwarf rootstocks (Gisela 5) at a planting distance of 3.5-4x1.5-2 m, using tree support means such as trellises and wire or individual wooden rods installed at the time of tree planting. Between the years 2022 and 2023, in the north of the Republic of Moldova, the impact of the cultivation system of sweet cherry trees (*Prunus avium L.*) of the Kordia, Regina, Summit, Valina, Stefanny, Sharetta and Marissa varieties, grafted on Gisela 6, which were planted in 2018 at a distance of 4x1 m was evaluated. The trees had super spindle shaped crowns. The shaping and pruning of the trees, the yield and the distribution of the fruit according to their diameter were studied. The purpose of the pruning was to create favorable air drainage in the crown.

The trees that have super spindle shaped crowns, which is a variant of the thin spindle shaped crowns, require posts and wires to support them, and an irrigation and fertilization system. At planting, the unbranched trees, grafted on Gisela 6, were shortened 30-40 cm from the ground in order to form a well-developed shoot, which would become the axis and develop branches that develop from lateral buds. In trees with lateral branches, the branches were shortened to 2-3 vegetative buds. The crown was composed of a well-developed axis, which had short branches and fruiting branches.

The crown shaping was done in order to keep the branches near the axis in a physiologically active state for fruiting. It was performed by shortening the shoots to 1/3 of their length when the flower buds had differentiated and allowed the remaining buds to mature. During the period of vegetative rest, the excess of fruiting branches was cut. During the fruiting period, the fruit yield was 15-20 t/ha.

In recently planted orchards, it is necessary to apply pruning that overlap with the fruit harvesting or its completion, which reduce the crown shaping time and favor the early fruiting of the trees. During the fruiting period of the trees, the branches are not shortened but thinned; during the period of full fruiting, the pruning stimulates the growth and regulate the fruiting.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: crown shaping, sweet cherry tree, sweet cherry tree pruning.

CZU: 634.232:526.32(478)

THE BIOLOGICAL PECULIARITIES OF THE NEW SWEET CHERRY VARIETIES GROWN IN THE NORTH OF THE REPUBLIC OF MOLDOVA

Russu Stanislav

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: stanislav.russu@doctorat.utm.md

The variety is a factor of renewal and progress in horticulture, and is becoming increasingly important along with the production technologies and the ways of fruit utilization. Currently, at the international level, under the pressure of constantly growing market demands the requirements for the sweet cherry fruit varieties are as follows: there must be highly productive, be larger than 26 mm, with a dense pulp texture, a visually attractive red-yellow color, a thick stalk of medium length, sweet taste and intense specific aroma.

In 2018, the „Sermopharm” Company planted 10 hectares of sweet cherry trees of the Kordia, Regina, Summit, Sweet Valina, Sweet Stefani, Sweet Sharetta and Sweet Marissa varieties, grafted on Gisela 6, at a distance of 4x1 m. The trees had super spindle-shaped crowns. The biological characteristics of the new varieties imported from Italy were studied.

Kordia is a self-sterile variety resistant to diseases specific to sweet cherry trees. The burgundy skinned fruit are medium-sized, cordiform and elongated. The flesh is crunchy, juicy, sweet, non-adherent to the seed, and has a pleasant taste. Regina is a self-sterile variety susceptible to bacterial canker and leaf curl. The fruit are large, elongated, cordiform, with red shiny skin. The pulp is very consistent, slightly juicy, and sweet which possess optimal taste qualities. The fruit are resistant to handling, transportation and cracking caused by rain. Summit is a self-sterile variety susceptible to moniliosis. The fruit are cordiform, with red shiny skin and a very attractive appearance. The flesh is red, adjacent to the seed, medium hard, crispy, juicy, sweet and very tasty. Sweet Valina is a self-sterile variety resistant to fungal diseases. The pulp is fleshy, juicy, very aromatic, sweet with a good level of acidity. The fruit are large (diameter 32-34 mm), in the shape of a bright red heart. Sweet Stefanny is a self-fertile variety resistant to fungal diseases. It has an excellent pulp consistency: fleshy, juicy, very aromatic, sweet and with a good level of acidity. The heart-shaped red colored fruit are large (diameter 30-32 mm).

The purpose of the study was to study the technological properties of sweet cherry varieties taken from the world assortment and grown for the first time in the Republic of Moldova. During the fruiting period, the yield of the studied varieties was 15-20 t/ha.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: *sweet cherry tree, sweet cherry variety, sweet cherry tree growing.*

CZU: 634.232:631.811.98

THE IMPACT OF THE PRODUCT CROPAID NPA AND THE GROWTH REGULATOR PACLOBUTRAZOL ON THE GROWTH, FRUITING AND PRODUCTIVITY OF SWEET CHERRY TREE VARIETIES

Vamasescu Sergiu, Buză Cornelui, Talpalaru Dumitru, Russu Stanislav

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: vamesescus@gmail.com

The sweet cherry tree (*Prunusavium* L.) is a large fruit tree. In the Republic of Moldova, favourable conditions have been created for growing sweet cherry trees. However, in all fruit growing areas there are elements of limitation from a thermal point of view, namely heat in summer and late spring frosts, which occur quite often and are harmful to the crop. Frosts affect the flowering organs of plants, whose resistance to frost decreases as the growing season progresses.

The study was carried out in the central fruit-growing region of the Republic of Moldova, at the Petru Balan Individual Enterprise, in the district of Criuleni. The orchard was founded in the fall of 2014. The trees with Spanish cup-shaped crowns of the Skeena, Black Star and Lapins varieties, grafted on Maxma 14, were planted at a distance of 5x3 m. The Cropaid NPA antifreeze and the growth regulator Paclobutrazol, used to inhibit the growth of sweet cherry trees when applied to the soil as water around the tree trunk, were evaluated. The experimental design was as follows: G1 – the control group which was untreated; G2 – the use of the growth regulator Paclobutrazol (2 ml/tree) during the vegetative dormancy phase; G3 – the use of the drug Croplacid NPA 2 days before frost; G4 – the application of growth regulators Paclobutrazol (2 ml/tree) during the vegetative dormancy phase + the drug Croplacid NPA (5 l/ha).

In G3, the percentage of viable buds was significantly higher compared to the control group. The studied varieties acquired resistance to negative temperatures, which led to the production of a significant percentage of healthy fruit buds. Up to the height of 1-2 m from the soil, 70-80% of the buds were healthy. The preparations Cropide NPA and Paclobutrazol increased the photosynthetic capacity of trees by increasing the concentration of chlorophyll in leaves and leaf surface by 1.5-3.5%, which amounted to about 25-30 thousand m²/ha. Thus, the leaves became thicker and healthier, and the plants were better able to withstand unwanted external factors.

The use of the drug Cropaid NPA (5 l/ha) and the growth regulator Paclobutrazol (2 ml/tree) during the vegetative dormancy phase reduces tree growth and protects the crop from late spring frosts. As a result, in 2022, the fruit yield was 16.5 t/ha for the Lapins variety and 18.5 t/ha for the Skeena variety.

Acknowledgment: This study was supported by the National Agency for Research and Development, project 20.8000.5107.04 „Adaptation of sustainable and ecological fruit production technologies in terms of quantity and quality in accordance with the integrity of the crop system and climate change”.

Keywords: *growth regulator, sweet cherry tree, sweet cherry tree variety.*

USING ORNAMENTAL *ALLIUM* SPECIES IN GARDEN DESIGN

Voineac Ina

„Al. Ciubotaru” National Botanical Garden (Institute), SUM, Chisinau,
Republic of Moldova
E-mail: inna0566@mail.ru

Among the wide range of ornamental plants, the representatives of the genus *Allium* L. are of great interest, as they possess numerous useful properties – medicinal, food, melliferous, vitamin and ornamental. The purpose of our research was to study of adaptive and bioecological features of ornamental *Allium* L. species and to determine the direction of their use in landscape design. The research subjects were 10 species of *Allium* L. from the collection of ornamental plants. The research was carried out on the experimental site of the Laboratory of Ornamental Plants, using the methods: Cheremushkina (2004), Pavlova (2010), Methodology of phenological observations in botanical gardens (1979). Based on the results of phenological observations, a spectrum of the studied species of ornamental alliums was compiled. According to our observations, *Allium caeruleum* Pall and *Allium atropurpureum* Waldst. et Kit begin to grow in the middle of February. *Allium moly* L. sprouts later than all others; it grows and develops until the flowering stage in only 3 weeks, blooms for 2 weeks and seeds ripen 10-15 days after the end of flowering, and the full cycle from germination to seed ripening occurs in an average of 74.5 days. Then there is a period of dormancy until the vegetative phase begins next year. *Allium atropurpureum* Waldst. et Kit emerges in the second half of February - early March, it takes 59 days to produce buds, flowering lasts 12 days and the seeds ripen 20 days after the end of flowering, then the plant begins a long period of dormancy. The full cycle of growth and development from germination to full ripening of seeds lasts 120 days.

All species of alliums grown by us under the conditions of the „Al. Ciubotaru” National Botanical Garden (Institute) go through a full development cycle, bloom and reproduce, which characterizes the stability of their cultivation.

Such species as – *Allium giganteum* Regel, *Allium aflatunense* B.Tedsch, *Allium chistophii* Trautv., *Allium moly* L., *Allium sphaerocephalon* L., *Allium atropurpureum* Waldst. Et Kit, *Allium caeruleum* Pall, *Allium spledens* L., *Allium schoenoprasum* L., *Allium odorum* L. are recommended for growth in ornamental flower beds, for group plantings on lawns, rock gardens and for cut flowers.

Acknowledgments: This study was supported by the research project „Research on the mobilization of plant diversity with ornamental potential for ex situ conservation” - 20.80009.7007.14, funded by ANCD.

Keywords: *adaptive ability, Allium, bioecological features, distribution, garden design, promising species, uses.*

CZU: 634.743:631.53.04(478)

**MANAGEMENT OF BUSINESS MODELS IN THE CULTIVATION
OF SEA BUCKTHORN WITH THE APPLICATION OF
DIFFERENT PLANTING SCHEMES IN THE CONDITIONS OF
THE REPUBLIC OF MOLDOVA**

Zbancă Andrei, Popa Sergiu, Ribențiv Ion

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: andzbanca@yahoo.com

In the conditions of the market economy and the launch of the sea buckthorn cultivation business, an important role for the entrepreneur is the correct selection of the business model that offers the highest competitiveness of the finished product and the integration into the value chains by creating added value to the traded products.

In this context, the given article is aimed at providing complex analyzes for the information and selection of the competitive business model for the entrepreneur in what provides for the analysis of investment budgets for the establishment of the white sea buckthorn with the application of different planting schemes (density of trees per hectare) and the analysis the economic efficiency of the cultivation of sea buckthorn for the proposed models. The authors prepared income and expenditure budgets for the fruiting period and compared the economic results and the level of profitability for business models with sea buckthorn.

Based on the research and analysis carried out, conclusions were formulated for the sustainable development of the white buckthorn branch necessary for the implementation by the actors of the value chains in the sector and especially for the agricultural producers.

Sea buckthorn is a branch of perspective in the conditions of the Republic of Moldova and international sustainable trade, it is part of the horticultural - orchard sector and is a component of high-value agriculture, which can be cultivated both in conventional / conservative farming systems and in organic farming.

Keywords: budget, business model, competitiveness, cost of sales, gross profit, investments, profitability, sales income.

Subsection - 2.2 Plant protection

CZU: 633.16:632.952 (478)

RESULTS OF THE TESTING OF THE NEW REMEDIES WITH FUNGICIDAL ACTION ON WINTER BARLEY IN THE CONDITIONS OF THE REPUBLIC OF MOLDOVA

**Bivol Alexei¹, Bădărău Sergiu¹, Iurcu-Straistaru Elena², Bivol Elisaveta¹,
Tacu Valeriu¹**

¹Technical University of Moldova, Chisinau, Republic of Moldova

²Institute of Zoology of SUM, Chisinau, Republic of Moldova

E-mail: bivolalexei65@gmail.com

Eared cereals, including winter barley, are subjected during the vegetation period to an attack pressure from numerous pathogens, causing foliar and ear diseases, which present a particular danger for the quality and quantity of the harvest. Annual plants are subjected to the intervention of a complex of pathogenic agents, which include over ten species of diverse mycotic nature, as key objects of economic importance that annually cause serious damage such as: *Ustilago tritici*, *Tilletia caries*, *T. foetida*, *Puccinia recondita*, *P. glumarum*, *P. graminis*, *Erysiphe graminis*, *Fusarium graminearum*, *Septoria tritici*, *S. graminum*, *Helminthosporium tritici-repentis*. Based on the current phytosanitary situation challenging the range of specific diseases, the purpose and objectives of the research carried out in the years 2022-2023 estimate the investigations on some pathogenic agents in the winter barley crop in order to develop and implement new chemical remedies in the integrated plant protection system as are: Amistar Prime, SE, Ampir, SC and Lot no. 1, SC with fungicidal action in combating key diseases in barley culture. At the same time, we set out to establish the biological efficiency values of the fungicidal products tested in combating pathogens: *Erysiphe graminis* f. sp. hordei, *Helminthosporium gramineum*, *Helminthosporium teres*, *Puccinia anomala*, *Septoria graminum* made under the conditions of cereal agrocenoses on productive sectors of SRL „Vatra-Razaseasca”, Central zone, Ialoveni district. The comparative research results highlighted the frequency and intensity of the attack, in the years 2022-2023, in values of 13-22%, in impact with environmental factors. Following the application of the treatments with the new remedies such as: Amistar PRIME, SE, Ampir, SC and Lot no. 1, SC as current fungicides for the winter barley culture, with a wide spectrum of mentioned mycotic action, they estimated an efficiency high in values of 85.0 - 93.3%, compared to doses and variants, which were at the level of the standard variant. Based on the experimental results obtained, it was proposed to include the tested preparations: Amistar PRIME, SE, Ampir, SC and Lot no. 1, SC in winter barley chemical protection management according to the economic damage threshold.

Acknowledgments: The research program was carried out within the technical-scientific collaboration contract no. 3/2023 regarding the testing of phytosanitary products.

Keywords: winter barley, biological control, chemical management, disease, fungicides.

COMPARATIVE CHEMICAL MANAGEMENT IN COMBATING DISEASES SPECIFIC TO AUTUMN RAPE WITH THE USE OF NEW REMEDIES WITH FUNGICIDAL ACTION

**Bivol Alexei¹, Bădărău Sergiu¹, Iurcu-Straistaru Elena², Bivol Elisaveta¹,
Tacu Valeriu¹**

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Institute of Zoology of SUM, Chisinau, Republic of Moldova*

E-mail: bivolalexei65@gmail.com

Autumn rape represents one of the sources of vegetable oil with estimative and bioenergetic potential, which in recent years tends to occupy more and more extensive areas, and in order to obtain stable major harvests, it is necessary to know the etiological composition of the parasitic microflora, which is very diverse and numerous, including several dozen species of pathogenic agents of different etiological nature. But with all these efficient cultivation procedures, the environmental conditions intervene favorably in the initiation and development of a wide spectrum of associated pathogenic microorganisms. It is a particularly sensitive crop to diseases, especially during the time period from seed germination to the formation of the first pair of true leaves, where more extensive and invasive diseases and pathogens intervene, such as: white rot (*Sclerotinia sclerotiorum*), alternariosis (*Alternaria brassicae*), fomisosis (*Phoma lingam*), manna (*Peronospora parasitica*), gray rot (*Botrytis cinerea*), rotting and dropping of seedlings (*Pythium de baryanum*, *Olpidium brassicae*, *Alternaria brassicae*, *Phoma lingam*, *Fusarium oxysporum f. conglutinans* etc). The integrated disease protection system involves the use of all the challenges of preventing and combating the attack of pathogenic agents, but also by applying phytosanitary treatments in situations of advanced invasions that compromise the harvest of caryopes. That is why the purpose and objectives presented in the works are focused on the research-testing of new fungicides effective in combating the complex of invasive diseases in the fall rape culture. The results and analysis of the values obtained in the research program - testing in determining the biological efficiency of the new fungicides: Bibnos Activ 380 SC and Joust Pro, in regulating the pathological impact with pathogens, such as: *Alternaria brassicae*, *Phoma lingam* and *Sclerotinia sclerotiorum*, reflected values of the biological efficiency in the medium of 86.6 - 92.9%, compared to variants and doses compared to the standard variant. The tested remedies are up-to-date and welcome in the management of chemical protection in the fall barley crop, with a wide spectrum of fungal action, with proposals to include the tested preparations: Bibnos Activ 380 SC and Joust Pro for their application in the chemical protection system requirement in the rape crop of autumn.

Acknowledgments: The research program was carried out within the technical-scientific collaboration contract no. 3/2023 regarding the testing of phytosanitary products.

Keywords: autumn rape, biological efficiency, diseases, fungicides, testing.

COMPARATIVE NEMATOLOGICAL RESEARCH ON INVASIVE AND VECTORAL IMPACT ON THE APPLE CROP UNDER THE CONDITIONS OF THE INTENSIVE VALUATION SYSTEM

**Bivol Alexei¹, Toderas Ion², Sasaneli Nicola³, Rusu Ștefan²,
Iurcu-Straistaru Elena², Bivol Elisaveta¹**

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Institute of Zoology of SUM, Chisinau, Republic of Moldova*

³*Institute of Sustainable Plant Protection, CNR, Bari, Italy*

E-mail: bivolalexiei65@gmail.com

In the respective work were carried out bioecological and taxonomic investigations of invasive nematode populations and parasitic vectors associated with apple culture, compared in classic and intensive type orchards. Phytosanitary helminthotic biological control is prioritized through the seasonal and annual monitoring of evidence and remediation methods, through logistical and intellectual means, which are the basis of the research program within the Parasitology and Helminthology Laboratory, Institute of Zoology, according to the annual research programs of the State Program project, between the years 2020-2023.

The current events addressed motivated the purpose of the investigations carried out in the comparative establishment of the diversity of invasive nematode complexes and the vector helminthological parasitic impact on apple culture in various fruit-growing sectors, with the elucidation of the most dangerous species with a harmful effect in productive apple orchards. The objectives highlighted the most invasive species of nematodes and vectors of pathogenic viruses from the orders *Thylenchida* and *Dorylaimida*, associated with apple culture in various areas and apple orchards in the Republic of Moldova. Through specific methods and analyzes in the orchards and the laboratory, the diversity and structure of the nematode complexes associated with 15 invasive and vector species with parasitic impact and the provocation of viruses in practically all investigated sectors were established, where the most common species are highlighted: *Longidorus elongatus*, *Xiphinema index*, *X. riversi*, *X. brevicolle*, *X. diversicaudatum*, *Trichodorus primitivus*.

Comparative values of the density of the numerical flock were in abundance of 30-150 individuals/100 g/soil, compared to the investigated sectors and areas. At the same time, the frequency and intensity of the development of helminthotic diseases with the presence of 13 viruses caused associatively expressed by symptomatic aspects and degree of disease in the dynamics of growth and development of trees was estimated. They were noted with symptomatic diseases of viruses in trees on fruit and young saplings on leaves and shoots in average values of 5-20%, compared to maintenance technologies.

Keywords: apple orchards, biological indices, nematodes, phytosanitary control, viral diseases.

TRACKING OF SOME FUNGAL PLANT PATHOGENS IN THE APRICOT PLANTATION

Mihailov Irina¹, Rusu Ludmila², Panuța Oxana³, Balan Valerian⁴

¹*Institute of Zoology of SUM, Chisinau, Republic of Moldova*

²*IP Central Phytosanitary Laboratory, Chisinau, Republic of Moldova*

³*Technical University of Moldova, Chisinau, Republic of Moldova*

E-mail: irinus1982@yahoo.com

Every year, due to climatic fluctuations, various types of plant pathogenic microorganisms of different origin appear on cultivated fruit plantations, which are of increasing interest in research and periodic observations. In this case, the studies given in this paper are related to an apricot orchard located on a plot of 15 ha in Criuleni district. Apricot, being in the status of a monoculture, in the seasonal period of 2021 and 2022, was planned in the scientific program of phytosanitary monitoring and control of plant pathogenic fungi in order to obtain a good harvest, which is attractive in the commercial aspect. The work includes the process of monitoring fungal pathogens on the apricot plantations in Criuleni district, extending over an area of 10 ha. In the search were taken samples from sector A, B, C and D.

According to the plan there were analysed 3 plots and it was obtained 6 negative and 14 positive samples from the plot 1A in 2021. In that year of research, *Monilinia laxa* was obtained from 7 samples, *Clasterosporium carpophilum* was in 5 samples. *Phytophthora* sp. was found only in one sample.

On the 3 plots analysed, samples from sector B, in 3B during both years, *Phytophthora* sp. was found only in 2021, 3 other pathogens were registered in 6 samples in 2022. The number of positive samples with fungal pathogens was minor in sites 1B and 2B, negative samples were dominating as 15/18 for site 1B and 19/11 for 2B.

In plot 1C, the number of samples with symptoms was 8 for both years of study (2021-3/2022-5). There were 22 sample from plot 2C (2021-6/2022-16) and 11 samples from plot 3C (2021-4/2022-7).

During the studies of apricot plantations, there were found 4 fungal plant pathogens, 2 pathogens identified at the species level (*Clasterosporium carpophilum*, *Monilinia laxa*) and 2 other organisms at the genus level (*Fusarium* sp. *Phytophthora* sp.). The report of two-year monitoring (2021-2022) includes records concerning the collection of 20 samples per site (240 samples per year in total), numerical count of samples with symptoms, laboratory testing, count of negative samples.

Acknowledgments: The work was implemented with the financial support of the institutional scientific project state program: 20.80009.5107.04.

Keywords: *apricot plantations, monitoring, Clasterosporium carpophilum, Monilinia laxa, fungal diseases, Fusarium sp., Phytophthora sp.*

CZU: 632.79(478)

THE SAWFLY ASH PESTS (HYMENOPTERA, TEHTHREDINIDA) FROM THE REPUBLIC OF MOLDOVA

Mocreac Nadejda^{1,2}

¹Technical University of Moldova, Chisinau, Republic of Moldova

²Institute of Zoology of SUM, Chisinau, Republic of Moldova

E-mail: mocreacnadejda@gmail.com

In addition to native pest species the latest pathogenically agent invasions, especially of insects cause severe damage to the tree species from the green zones of the towns, along the sides of the roads; from the Forest Fond of the Republic of Moldova, and orchards, etc. Ash trees represent an important component in the formation of forest ecosystems in the Republic of Moldova. The studies were done during 2013 – 2023, with the main objective of identifying the impact of insect pests on ash ecosystems in conditions of the Republic of Moldova. The observations were made in the ash woods from different parts of the republic, especially those from the Moldavian Plateau; of the Forest Enterprises Chisinau, Tighina, Rezeni, Telenesti, Orhei, Nisporeni; Scientific Reserve „Codrii” and certainly from the Scientific Reserve „Plaiul Fagului” where ash is one of the dominant species. Preliminary research was carried out in sub-plots with a minimum of 30% ash in the composition, having an area of 3.0 ha. Apart from this, the object of the research was also the stands with 10-20% ash but growing in pure groups. The route was always chosen spontaneously, in the direction that intersects the subplot diagonally, and the defoliation degree (with a gradation of 10%) of 25 ash trees was visually appreciated. The route is required to cover 3/4 of the supervised distance of the subplot. As the result of the investigation was established that these three species have a generation annually and hibernate in the pre-pupal stage - eonymph. In addition, the privet sawflies are native poly- and oligophages, among the fodder plants of which are common ash (*F. excelsior*). Primary damages caused by the ash sawfly larvae consist of perforated leaves by the young larvae, and then leaf consumption, leaving only the area between the veins. Adult caterpillars eat leaves completely, leaving only the central vein. The defoliation caused by the larvae of the last ages, which are very voracious, in the maximum or eruption phases of outbreaks, can reach up to 80-200 percent. Secondary damage consists of laying eggs by females by the instrumentality of the lightly sclerotized ovipositor into the tissue of the lower epidermis of newly emerged foliage, mainly near the central vein; as a result of this, the leaves are slightly distorted.

Acknowledgements: This paper was supported by the State Program, the project No. 20.80009.7007.02 „Evolutionary changes in economically important terrestrial fauna, rare and protected species under anthropogenic and climatic changes”.

Keywords: *Ash, Ash pests, damage, defoliation, ecosystem, Republic of Moldova.*

Subsection - 2.3 Viticulture and vinification

CZU: 663.2(478)

THE POPULATION CONSUMPTION OF WINES AND ALCOHOLIC BEVERAGES IN THE REPUBLIC OF MOLDOVA

Covaci Ecaterina and Vladei Natalia

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ecaterina.covaci@enl.utm.md

Currently, the consumer has the possibility to purchase the already existing products or the improved and fortified ones. The consumption of wine and alcoholic beverages in the Republic of Moldova Currently, the food systems of the Republic of Moldova face numerous challenges. The objective of this study is to highlight the attitude of consumers in the Republic of Moldova regarding the wines and alcoholic beverages. Data collection was carried out between November -December 2022, on a sample of 270 people between 18 and 70 years old, studying the opinion through a printed and an electronic form. The results showed that 31.7% prefer white wines, another 21.7% red and 34% do not care about the color of the wine consumed. Regarding the preferences regarding the residual sugar content in the consumed drinks, for 42% the preferred wines are the dry ones and only 10% prefer the semi-sweet assortment, contrary to the reverse trend of Romanian consumers. The presence of wine brands such as: *Rara Neagră*, *Feteasca Regală*, *Viorica*, *Pastoral*, *Cabernet Sauvignon*, *Chardonnay* and *Muscat* in their product assortments is recommended to wine producers and traders. Most respondents (93%) prefer local wines from Purcari, Cricova, Mileștii Mici and Acorex wineries. In the opinion of both sellers and buyers, the Purcari brand is the leader on the local market, but there are also brands from the Călărași, Vinăria din Vale, Vitis-Hîncești, Imperial Vin, Maurt, Vismos, Bardar, Cascad, Aroma, Ialoveni, Cojusna, etc. These consumer preferences should be considered especially by sellers, while for producers, these trends highlight successful producers in the local market who serve a good example for the rest of the wine producers. Another aspect describes is that the glass bottle for 89% of the respondents remained the most suitable packaging for a good wine. The preferred stopper are cork ones with a weight of 82%, and the preferred packaging volume is 0.75 l, followed by PET bottles with a nominal volume of 1.5 l and for Bag in Box packaging of 2 ÷ 5 l. Dynamically, 86.7% of respondents would prefer to find details about the product and 72% about the producer and distributor on the wine packaging label. A considerable share of respondents would prefer information on the warranty period (45%), gastronomic recommendations (33%) and the harvest year, production technology, alcohol content for a total of 20%.

Acknowledgments: The research was funded by state project 20.80009.5107.09 „Improving of food quality and safety through biotechnology and food engineering”, running at Technical University of Moldova.

Keywords: *glass bottle and cork stopper, wine consumption, wine brands.*

QUANTIFICATION OF THE CONTENT OF BIOLOGICALLY ACTIVE SUBSTANCES IN NATIVE RM GRAPES VARIETIES

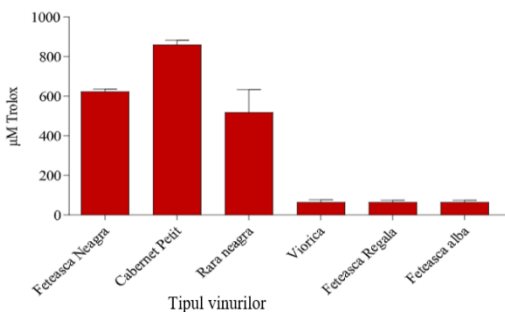
Covaci Ecaterina, Sclifos Aliona and Balanuța Anatol

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ecaterina.covaci@enl.utm.md

The originality and typicality of the product present on the market is an important decision factor of consumer in its market choice, therefore it is considered appropriate and necessary to place some wines obtained from local autochthonous varieties specific to the wine-growing areas of the Republic of Moldova, in order to increase the competitive wine production on international markets.

The objective of this study is to highlight the content of biologically active substances in native grapes varieties cultivated in Republic of Moldova. Data collection, showed that in the experimental samples of *Fetească Regală*, the presence of three terpenic compounds (linalool, trionenol and α -terpineol) was observed in limited quantities between 0.11 and 0.72 mmol/L. The dry red wine produced from the *Feteasca Neagra* variety, SF contents was 792 mg/L, monomers anthocyanins (237 mg/L), 11.5% delphinidin-3-glucoside, 49.3% malvidin-3-glucoside and combined anthocyanins of 34.7 %.



The antioxidant capacity show, in descending order, a maximum for *Cabernet Petit* estimated at 886 μ M Trolox/ml, followed by *Feteasca Neagră* and similar values between 48 ÷ 59 μ M Trolox/ml for white wines.

Figure 1. Antioxidant capacity (assessed by the DPPH radical method) expressed in μ M Trolox

The trichromatic analysis allows to attest the partial oxidation of the pigments in *Feteasca Neagră* due to the grape's pigments and the higher activity of polyphenoloxidases.

Acknowledgments: The research was funded by state project 20.80009.5107.09 „Improving of food quality and safety through biotechnology and food engineering”, running at Technical University of Moldova.

Keywords: *antioxidant capacity, local grapes varieties, wine technology.*

CZU: 634.85:581.14(478)

THE GROWING AND DEVELOPMENT OF THE VINES OF FETEASCA ALBA GRAPE VARIETY IN DIFFERENT WINE REGIONS OF THE REPUBLIC OF MOLDOVA

**Mogildea Olga, Nicolaescu Gheorghe, Godoroja Mariana,
Voinesco Cornelia, Procopenco Valeria**

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: o.manolachi@gmail.com, olga.mogildea@h.utm.md

The wine sector is the calling card of the Republic of Moldova, the wines being highly appreciated at numerous international competitions. At the moment, the global trend is oriented towards the production of wines from local varieties. Fetească Albă, is a white wine variety for local wine, cultivated for centuries in the Republic of Moldova, occupies the largest area among the local varieties registered in the Wine Register - approx. 748 ha. The current research is limited to the comparative study of the Feteasca albă variety for white wines in different growing conditions of the Republic of Moldova.

The research was carried out with the financial support of the National Vine and Wine Office in the period 2017-2021, within the project - „Quality grapes” - „Dissemination of good practices through field schools for winegrowers”. The object of study was the Feteasca albă wine variety, cultivated in 2 wine-growing regions intended for the production of Codru and Stefan Voda PGI Wines. The experimental plots are located in the Speia and Purcari localities. The plantation in the Purcari experimental sector was established in 2010, managed according to the bilateral Royat cordon form with a planting scheme of 2.5 x 1.2 m and the plantation in the Speia experimental sector was established in 2015, managed according to the regular bilateral Guyot stump shape and the 2.2 x 1.4 m planting scheme. Following the determination of the agrobiological indices, the following data were obtained: for the Purcari experimental sector, we can mention that the relative fertility coefficient (RFC), on average, was 1.11. The absolute fertility coefficient (AFC) was on average 1.3. Relative productivity indices (RPI), on average constituted 140.15 g. The absolute productivity index (API) averaged 161.04 g. The mass concentration of soluble dry substances varied between 20.4-22.4 % Brix and the titratable acidity was between 4.5-5.2 g/dm³. For the experimental sector Speia - the RFC, on average, obtained the value of 1.69, and AFC, on average, constituted 1.72. The RPI averaged 253.68 g and the API averaged 257.46 g. The mass concentration of soluble dry substances varied between 20.6-22.3 % Brix and the titratable acidity was between 5.5-4.0 g/dm³. After analyzing the climatic conditions in the reference years, we can mention that they differ from year to year and from one region to another. They directly influence the beginning of the first phenological phase and the duration of the vegetation period of the vine, which was between 188-224 days.

The value of the quality and productivity indices of the vine depends on the culture system, load and of course the pedoclimatic and orographic conditions of the region.

Keywords: Feteasca albă, stump, wine-growing regions.

CZU: 634.8(478)

STUDY OF GRAPE PRODUCTION DYNAMICS IN THE AUTONOMOUS TERRITORIAL UNIT OF GAGAUZIA

Parmacli Dimitrii, Cara Serghei

Comrat State University, Comrat, Republic of Moldova

e-mail: parm741@mail.ru

It is emphasized that grape production has its peculiarities, which are determined by the significant influence of the natural biological system, namely the soil, plants, and climate. As a result, the industry is characterized by high instability in annual production indicators.

Therefore, the methodology for assessing production dynamics requires refinement and the application of unified approaches that are practical. The article aims to present methodological approaches for assessing grape production dynamics, including the use of graphical research methods. The article employs economic-mathematical, abstract-logical, and graphical research methods.

The article examines grape production indicators over the last 12 years in the Autonomous Territorial Unit of Gagauzia. Analysis of the dynamics showed that over the studied period, grape yield exhibited an ascending trend, with production expansion driven by intensive factors such as increased yields per unit. However, the industry is characterized by low production indicator stability: the coefficient of variation in yield over the years of study reached 25.9%, with a range of variation exceeding 85% of the actual level. Calculations of potential yield levels indicated that the industry possesses real reserves for productivity growth, of at least 20 tons per hectare.

The study confirms the practicality of the methodology for assessing industry development dynamics in agriculture and the necessity of its application, both for educational purposes and under the real conditions of agricultural organization activities.

Keywords: yield, gross harvest, growth reserve, plantation area, potential level, stability.

THE INFLUENCE OF GRAPEVINE CANOPY MANAGEMENT ON VINEYARD PRODUCTIVITY IN STEEP ENVIRONMENTS

Shtirbu Andrii

NSC „V.Ye. Tairov Institute of Viticulture and Winemaking”, Odesa, Ukraine

E-mail: stirbu.a@gmail.com

To study the response of grapes to canopy management under the Steppe environment and to elaborate effective agrotechnics for non-irrigated cultivation.

The research was conducted at the NSC „V.Ye. Tairov IV&W” experimental plots from 2016 to 2020. Different horizontal vine cordon positions were tested in the experimental vineyard of wine grape cultivar `Aromatnyi`, with heights ranging from 0.4 m to 0.8 m, 1.2 m, and 1.6 m.

The weight of yield per vine (kg/vine) was determined during the grape harvest. The yield of the vineyard (t/ha) was calculated. Manual labor costs including grape harvest (man-hours) per hectare of vineyard and per unit of yield depending on variants of canopy management were calculated.

The highest yield was established at the position of the vine cordon at a height of 1.2 m with free-growing of shoots, and the minimum – at a height of 1.6 m with downward shoot positioning. The yield weight, on average for five years of research, at a cordon height of 1.2 m is 11.6 t/ha. Reducing the cordon height to 0.8 m reduced the productivity of vines by 13.8%, to 0.4 m – by 25.9%. A reduction of yield weight by 42.2% was observed when cordon height was increased to 1.6 m.

The total manual labor costs, including harvesting, can vary from 432 to 635 man-hours per production cycle, depending on vineyard canopy management.

The minimum values of this indicator and, accordingly, a high level of labor productivity is established when shoots are grown on cordons located at a height of 1.2 m. Other canopy management systems studied increase manual labor costs per unit yield by 12.9% (cordon height 0.8 m), by 18.5% (cordon height 1.6 m), and by 37.0% (cordon height 0.4 m).

Canopy management is the practice of taking measures that have a significant impact on the vineyard's productivity. Grapevine cultivation on cordons located at a height of 1.2 meters is an effective method for semi-arid environments in the Steppe. The indicator of manual labor costs per unit mass of yield indicates that this system is highly productive in non-irrigated vineyards and technologically efficient.

Acknowledgments: This study was supported by the research project 21.00.03.04.Φ. „Scientific substantiation of bioadaptive methods of grape cultivation by optimization plant production process in environmental conditions of Northern Black Sea region”, funded by National academy of agrarian sciences of Ukraine.

Keywords: *canopy, grape, yield, labor costs, training system, vine.*

Subsection - 2.4 Forestry and public gardens

CZU: 630*2

SUMAL 2.0 – A MODERN TRACEABILITY TOOL

Apăfăian Andrei¹, Dincă Lucian¹, Crișan Vlad¹, Enescu Cristian Mihai²

*¹„Marin Drăcea” National Institute for Research and Development
in Forestry, Brasov, Romania*

*²University of Agronomic Sciences and Veterinary Medicine of Bucharest,
Department of Soil Sciences, Romania
E-mail: apafaian.andrei@gmail.com*

In the last years the digitalization of the forest sector increased in Romania and traceability tools are present than ever due to the demand of transparency from state authorities and civil society. Also, the means to fight illegal logging diversified in order to comply with the directives and regulations of the European Union. However, besides legal requirements also certification schemes can support responsible forestry management and can guarantee that the certified entities are providing goods from a responsibly managed forest. The electronic wood tracking system, SUMAL 2.0 is a modern tool for traceability of harvesting sites, timber transports and natural protected areas. It complies with the requirements of the national legislation in force but also the European legislation such as the European Union Timber Regulation and the efficiency of the system was proven in the following months after its launch. The number of interrogations by NGO's and citizens in the system grew constantly.

In this research article an analysis of the features of the SUMAL 2.0 were made in order to highlight the impact on the transparency of the forestry sector. The public version of the application is presented resulting in an overview analysis of capabilities and functions of the tool. After 6 months of its launch in March 2021, Ministry of Environment, Water and Forests communicated an official release statement. In this interval, 64.000 users are registered in SUMAL 2.0 that had issued 2.2 million delivery notes with a total transported volume of 21 million cubic meters. For this volume, 858.000 checks were made in the application by civil society showing the interest for the legality of wood. This checks also generated 3.468 calls at the unique emergency number „112” where suspicious transports were reported. Furthermore, after the checks were made by police and forest structures with control attributions it proved out that from the initial number, 754 transports raised suspicions and 123 were confirmed as being illegal.

Even though such tools offer to the public information that was never possible in the past, with positive effects, it requires that the end-user should have certain knowledge about the forestry system. Poor knowledge, even though the user is well intended it can trigger false alarms. This can act as a burden to police or specialized control authorities that are spending valuable time to investigate alerts that at the end turned out to be unfounded.

Keywords: digitalization, illegal logging, governance, legislation, traceability.

DYNAMICS OF CHEMICAL TRAITS OF DOWNED DEAD WOOD IN A TEMPERATE OLD-GROWTH FOREST

**Buezo Javier^{1,2}, Medina Nagore³, Hereş Ana-Maria^{1,4}, Petritan Ion Cătălin¹,
Petritan Any Mary⁵, Esteban Raquel⁶, Curiel Yuste Jorge⁴**

¹*Forest Management Planning and Terrestrial Measurements, Faculty of
Silviculture and Forest Engineering, Transylvania University of Brasov, Romania*

²*Department of Plant Biochemistry, Center for Plant Molecular Biology (ZMBP),
Eberhard Karls University, Tübingen, Germany*

³*Departamento de Biología (Botánica), Universidad Autónoma de Madrid, Spain*

⁴*BC3 - Basque Centre for Climate Change, Scientific Campus of the University of
the Basque Country, Spain 7*

⁵*„Marin Drăcea” National Institute for Research and Development in Forestry,
Brasov, Romania*

⁶*Department of Plant Biology and Ecology, University of Basque Country
(UPV/EHU), Leioa Bizkaia, Spain*

E-mail: petritan@unitbv.ro

Old-growth forests (OGF) are considered paramount for the local biodiversity and are defined by their high quantities of dead wood. Acting like a nutrient reservoir and home for a multitude of different organisms, dead wood is such a paramount factor in the ecosystem that the survivability of hundreds of species is endangered when it is removed or extracted. The interaction between the scavengers and the dead wood relies heavily on its chemical traits, which in turn depends invariably on the original species, diameter of the dead wood piece or the time since its fall. This work aimed to study in detail the chemical composition of the dead wood originated from the two dominant species (Silver fir and European beech) of an old-growth temperate forest in Sinca, Romania, one of the few remaining old-growth forests in Europe. Different diameters (1 to 25 cm) of different ages of dead wood (from 1 to >4 years) were selected to perform a complete ionomics study along with carbon and nitrogen composition. Our results unveiled that while the Carbon/Nitrogen ratio decreases as the dead wood gets older, different cations such as Si, Ca or K significantly differ between species. Moreover, different cations also show multiple changes as the diameter of the piece increases. Our research shows a highly dynamic dead wood, with huge differences not only related to the species, but also to its size and age. These results are a step further in the understanding of the traits of the dead wood, and its importance in the biodiversity and the global nutrient and carbon turnover of an endangered ecosystem such as old-growth forests.

Acknowledgments: This study was funded by Romanian Ministry of Education and Research grant CNCS-UEFISCDI, project number PN-III-P4-ID-PCE-2020-2696, within PNCDI III.

Keywords: *deadwood respiration, CO₂ efflux, virgin forest, Carpathian Mountains.*

THE GROWTH OF *FAGUS SYLVATICA* L. SEEDLINGS OF DIFFERENT PROVENANCES IN THE NURSERY OF TELENESŢI FOREST ENTERPRISE

Chetrean Alexandru, Sfeclă Victor

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: alexandru.chetrean@spp.utm.md, victor.sfecla@spp.utm.md

The beech (*Fagus sylvatica* L.) is one of Europe's main forest tree species, growing in large areas of different environmental conditions. In the Republic of Moldova, the beech grows in the Eastern European limit of its natural area distributions, which naturally grows dispersed in the Central Plateau of Moldova, covering less than one percent of the country's forest area. Following the aridization of the climate during the recent decades, the problem of the stability and prospect of existence of this species in the structure of the forest fund appears. To study this issue, have been started the researches of dynamics of biomass accumulation in the above-ground part of beech saplings of different provenances installed in the Republic of Moldova, as well as their resistance to the action of unfavorable climatic factors.

For this purpose, in the fall of 2020, in the forestry nursery of the Telenesti forestry enterprise, seeds from different origins were sown: Baiut (Romania), Chernivtsi (Ukraine), Hirjauca and the Codrii and Plaiul Fagului scientific reserves (Republic of Moldova). The climate of the area where the nursery is located is temperate-continental with relatively warm winters and very hot, long-lasting summers. The habitat index of the experimental sector, are characterized by the forest-steppe ecotype in the valleys with the cambic chernozem soil, this are arid conditions for beech.

As a result of completing inventories, the diameters of the root collar and the height of the saplings were measured. Thus, the arithmetic average, of the diameters of the root collar, are: Chernivtsi 3.42 ± 0.16 mm, Hirjauca 3.34 ± 0.21 mm, Baiut 3.54 ± 0.18 mm, Codrii 4.41 ± 0.19 mm and Plaiul Fagului 3.82 ± 0.26 mm. The indices of average increases in height, are as follows: Chernivtsi 16.54 ± 0.96 cm, Hirjauca 15.29 ± 1.13 cm, Baiut 18.07 ± 1.05 cm, Codrii 20.94 ± 1.11 cm and Plaiul Fagului 17.93 ± 1.13 cm. Regarding the growth of the beech saplings in the experimental sector, by volume per provenance, in the second year of vegetation, the results are: Chernivtsi 529 ± 33 mm³, Hirjauca 614 ± 76 mm³, Baiut 1149 ± 176 mm³, Plaiul Fagului 1072 ± 173 mm³ and Codrii 1306 ± 118 mm³. The biggest increases were recorded by the saplings with the Codrii provenance. This confirms the thesis, presented by some researchers, that the beech saplings that grow in our country, are more xerophytic.

Acknowledgments: This study was supported by the research project number: 20.80009.7007.07 „Determination of parameters characterizing the resistance of plants with different levels of organization to the action of extreme temperatures in order to mitigate the effects of climate change”, funded by National Agency for Research and Development.

Keywords: *growth of Fagus Sylvatica, Nursery, Republic of Moldova.*

THE EFFECTS OF MAINTENANCE WORK ON THE GROWTH OF SPRUCE SEEDLINGS IN THE NURSERY

**Chilat Mihail-Gabriel, Sîngeorzan Steluta-Maria, Truța Alina Maria,
Morar Irina, Holonec Liviu**

*University of Agricultural Sciences and Veterinary Medicine, Faculty of Forestry
and Land Surveying, Cluj-Napoca, Romania*

E-mail: steluta-maria.singeorzan@usamvcluj.ro

Lately, the regeneration and expansion of forests has been carried out using artificial interventions, the most suitable method being plantations, using high-quality forest seedlings. In order to achieve this, maintenance work on nursery crops plays an important role.

Spruce was one of the first species to start breeding in Europe. This species is one of the most important ones, covering an area of approximately 30 million hectares at European level, and in Romania it covers an area of approximately 1.37 million hectares.

The present work aims to study the effects of maintenance works on the growth of spruce seedlings in nurseries. For this study, experiments were carried out in the Ursu Nursery of the Groșii Țibleșului Forestry Park.

In order to determine the effects of certain maintenance works on the development of spruce seedlings, a number of 6 test squares were made, where their diameter and height were analyzed. Two measurements were carried out, the first one at the beginning of the study, in 2022, and the second one in 2023, at the end of the study.

The maintenance works were: watering, weeding and soil mobilization. The best results on seedling development were obtained in the seedlings where the following works were applied: watering + folding + soil mobilization, where at the end of year 2022 the seedlings had a height of (25.33 cm), and in year 2023 having an extra 10 cm. It was also noted that weeding and soil mobilization between the rows of saplings had relatively equal effects on sapling height in both 2022 and 2023.

For the production of forest seedlings, it is recommended to apply maintenance work in all nursery crops, regardless of their type, as it has a beneficial role and gives a significant increase in seedling growth.

Keywords: development, Nursery, saplings, spruce, works.

CZU: 630*23(498)

ECOLOGICAL RECONSTRUCTION OF SOME WIND-BLOWN FOREST SURFACES FROM THE BARDĂU U.P.II, VIȘEU FOREST DISTRICT

**Coman Lucian Cristian, Rebrean A. Florin, Sîngeorzan Steluța-Maria,
Arion Iulia, Colișar Alexandru, Tăut Ioan**

*University of Agricultural Sciences and Veterinary Medicine, Faculty of Forestry
and Land Surveying, Cluj-Napoca, Romania*

E-mail: steluta-maria.singeorzan@usamvcluj.ro

In recent decades, storms have damaged considerable amounts of wood in European forests, resulting in substantial economic losses. These storms cause felling, which means any mechanical damage that affects a tree or a grove as a result of the action of the wind. Windfall can provide abundant breeding material for the spruce bark beetle (*Ips typographus*), thereby increasing the likelihood of the beetle population.

The main purpose of this study is the analysis of the abiotic reasons for the production of windfalls in several landscaping units within the Vișeu Forest Bypass. The biotic factors that can occur as a result and the ways to restore these affected stands were also studied. The study was carried out in the II Bardău Production Unit, 6 landscaping units were selected, within which demolitions occurred in 2017 and 6 landscaping units within which demolitions occurred in 2022.

As a result of this study, a number of 156.07 ha of trees affected by wind felling resulted, totaling a number of 1836 trees and a volume of 1764.56 m³. It is worth appreciating the fact that, in the specific case of the stands studied, the felling intervention represented a major disturbance in the structure and functioning of the ecosystems, but without catastrophic consequences or significant damage.

The main causes that led to these disturbances are meteorological, seasonal and the structure of the stands. If at high speeds neither the beech nor the ground have resisted, even less will the spruce monocultures resist, with large trees per hectare and not covered by care work. In each parquet, before planting, it is necessary to establish the nerve points for wind and snow knockdowns, i.e. the places with excess moisture, bends, slopes, edges and edges exposed to the wind as well as hearths with rot (after stumps). In the case of these stands, it is recommended to consider improving the stands from the perspective of composition, increasing the resistance and resilience of the forest and extracting the trees that need to be extracted from the forest.

Keywords: *arboretums, ecological reconstruction, wind gusts.*

ECOLOGICAL RECONSTRUCTION OF DEGRADED LANDS FROM THE ZAGĂR IMPROVEMENT PERIMETER, MUREȘ COUNTY

**Colișar Alexandru¹, Șimonca Vasile^{1,2}, Ceuca Vasile¹,
Sîngeorzan Steluța-Maria¹**

¹*University of Agricultural Sciences and Veterinary Medicine,
Cluj-Napoca, Romania*

²*„Marin Drăcea” National Institute for Research and Development
in Forestry, Brasov, Romania*

E-mail: alexandru.colisar@usamvcluj.ro

The problem that required the execution of technical improvement works was the existence of some sliding surfaces located on the slopes, behind which, after an initial stage of sliding, areas of excess water were formed, which without the execution of drainage channels would have led to the reactivation of the sliding processes of the slopes. In conjunction with the afforestation work, mechanical shaping of surfaces was also carried out, consisting of smoothing out roughness (ridges, mounds, slip steps) and levelling and levelling the topsoil. A greater number of species has been adopted in afforestation compositions to increase biodiversity, resistance of stands to impact with biotic and abiotic pests and thus increase their stability. Research under the theme aims to provide new insights into the behaviour of protective forest crops by comparing the data obtained. Observations have been made on the behaviour of species in mixtures and possible damage caused by abiotic and biotic factors. As far as erosion processes are concerned, observations were made on the areas where they are still active, the reasons why they have not been stopped and remedial solutions were proposed. Direct field observations and measurements were carried out, where sample squares were placed for each stationary unit under study. The sample markets were located in the most representative areas for each seasonal unit, the size and shape of the sample markets was determined to be 200 m² circular in shape, the radius of the circle being determined according to the slope of the land. Within these sample squares, diameters and heights were measured and the consistency, vitality of the trees and the existence of undergrowth was determined. Observations were made, both in the sample and overall markets, on aspects related to: the current composition and composition of afforestation, the differences that occur, the causes that led to the disappearance or appearance of some species; the influences they had on each other (inter-specific relationships); the influence of forest crops on erosion processes; the influence of abiotic factors on forest crops and the course of the natural regeneration process in the perimeter crops.

As a recommendation, it is necessary to fill in the areas of land where forest vegetation has not been established with species that have proved to be well adapted and vital in the existing seasonal conditions, and to build a drainage network.

Keywords: ecological reconstruction, erosion, species mixing.

***IN-SITU* CONSERVATION OF *EPIPACTIS PALUSTRIS* (L.)
CRANTZ IN THE REPUBLIC OF MOLDOVA**

Ionita Olga¹, Jardan Natalia²

¹„Al. Ciubotaru” National Botanical Garden (Institute), SUM, Chisinau,
Republic of Moldova

²„Codru” Reserve, Lozova, Straseni, Republic of Moldova

E-mail: olgaionita.gbn@gmail.com

The research of rare species is included both in the stipulations of national laws and strategies, as well as in the international obligations of the Republic of Moldova, and the protection of threatened species under *in-situ* conditions is a priority objective, included in the Biodiversity Conservation Strategies. Thus, the limiting factors can be quickly identified and urgent and effective measures taken to stop the decline of populations of species threatened with extinction and their conservation. The present study refers to *Epipactis palustris* (L.) Crantz (Orchidaceae family), critically endangered species, protected by law, included in the Red Book of the Republic of Moldova. Beyond the borders of the republic, it is spread across Europe, the Caucasus, Turkey, Iran and Central Asia. Included on the IUCN Red List of Threatened Species under the category of „Least Concern” and in Annex II of CITES. In the framework of the study, the population of the species under study reported in the „Codru” Reserve, was investigated, the degree of threat was estimated and the category of endangerment was established, according to the requirements of the International Union for Conservation of Nature, the limiting factors were identified and protection measures were proposed.

In the flora of the Republic of Moldova, according to data from the literature, during the last 50 years the state of the population has fluctuated considerably. Although in some publications, *E. palustris* is mentioned in two locations: Răciula village, Călărași district and Lozova commune (Strășeni), currently the presence of the species in the first one remains uncertain, because neither concrete data nor herbaceous material has been found from this site. At the end of the 70^s of the last century, it was mentioned that the species had not been found in the field for several years in a row and probably had even disappeared. Thus, as a result of field research in recent years, the population reported in the proximity of Lozova commune, from the „Codru” Scientific Reserve, was evaluated, the first collections here dating back to 1952. In the summer of 2023, the population of the *E. palustris* species covered an area of about 56 m² with ± 100 phytospecimens, predominantly mature, flowering specimens that reach 30-60 cm in height.

Acknowledgement. This study was supported by the research project “Research and conservation of vascular flora and macromycobiota of the Republic of Moldova”, 20.80009.7007.22. funded by NARD.

Keywords: *Epipactis Palustris* (L.) Crantz, rare taxa, conservation, Republic of Moldova.

EXPERIENCE OF USING DIFFERENT PLANTS IN URBAN ECOSYSTEMS

Ishchuk Liubov¹, Hrabovyj Volodymyr², Ishchuk Halyna³, Didenko Inna²

¹*Bila Tserkva National Agrarian University, Bila Tserkva City, Ukraine*

²*National Dendrological Park „Sofiyivka”, National Academy of Sciences of Ukraine, Uman City, Ukraine*

³*Uman National University of Horticulture, Ukraine*

E-mail: ishchuk29@gmail.com

Global ecological challenges in urban ecosystems, such as climate change, the decreasing availability of clean freshwater, noise pollution, irrational resource use, and overconsumption, compel society to seek rational solutions for their resolution. The most effective approach today remains the application of nature-based solutions within urban ecosystems, which are rooted in the logic and model of natural ecosystems. Thanks to their capacity to perform multiple beneficial functions simultaneously, these solutions can be seamlessly integrated into community development strategies across various sectors, including urban planning, green infrastructure, water resource management, waste management, and public participation, among others. Over the past decade, the European Commission has started to give special attention to nature-based solutions as an integral part of EU research and innovation policies. In 2020, nature-based solutions were officially recognized as a crucial tool for achieving the objectives of the European Green Deal. As part of this initiative, one aspect involves replacing lawns with native species of wildflowers that exhibit greater resilience to the biotic and abiotic factors of the urban environment.

In Ukraine, the traditional Soviet-era approach to landscaping, which includes mowed-down lawns, meticulously trimmed hedges, and lush flowerbeds with specially cultivated flowers, still persists. However, as Ukraine integrates into the European community, projects like these are becoming increasingly relevant in the country. The aim of our research is to analyze the experience of using wildflowers in Ukrainian urban ecosystems. In Ukraine, areas with wildflowers in urban ecosystems are relatively rare. Special use (extraction, collection) of objects from the Red Data Book of Ukraine is carried out in exceptional cases solely for scientific and breeding purposes and is completely prohibited for commercial purposes.

Thanks to their well-developed root systems, wildflower meadows retain twice as much water, reducing the need for human watering during both flood and drought periods. Wildflowers consume less water and require less frequent irrigation. Experimental wildflower meadow areas designed for educational purposes can be established near educational institutions and cultural sites.

Keywords: biodiversity, grasses, herbaceous perennials, ornamental flowerbeds, lawns, nature-oriented solutions, native species.

SOIL FAUNA BIODIVERSITY RESPONSES TO SIMULATED ANTHROPOGENIC DISTURBANCES IN EUROPEAN OAK FORESTS (HOLISOILS H-2020 PROJECT)

Santonja Mathieu¹, Baldrian Petr², Baldy Virginie¹, Biryol Charlotte¹, Dupouyet Sylvie¹, Encinas-Valero Manuel³, Fort Tania², Gros Raphael¹, Heres Ana-Maria⁴, Martinovic Tijana², Ménival Claire¹, Pérez-Izquierdo Leticia³, Petritan Ion Catalin⁵, Dutcă Ioan⁵, Sanchez-Moreno Sara⁶, Bagousse-Pinguet Yoann¹, Curriel Yuste Jorge^{3,7}

¹Aix Marseille Univ., Avignon Univ., CNRS, IRD, IMBE, Marseille, France

²Laboratory of Environmental Microbiology, Institute of Microbiology of the Czech Academy of Sciences, Praha, Czech Republic

³BC3-Basque Centre for Climate Change, Scientific Campus of the University of the Basque Country, Leioa, Bizkaia, Spain

⁴Faculty of Silviculture and Forest Engineering, Department of Forest Sciences, Transilvania University of Brasov, Romania

⁵Faculty of Silviculture and Forest Engineering, Department of Forest Engineering, Forest Management Planning and Terrestrial Measurements, Transilvania University of Brasov, Romania

⁶Institute for Agricultural and Food Research and Technology (INIA-CSIC), Madrid, Spain

⁷IKERBASQUE – Basque Foundation for Science, Bilbao, Bizkaia, Spain

E-mail: petritan@unitbv.ro

Soil biodiversity is essential for forest ecosystem functioning as they play key roles in litter decomposition or nutrient recycling. However, perturbations due to anthropogenic (thinning/clear-cut/slash removal) sources can lead to strong impacts on soil biodiversity. In a context of climate-smart forestry, our knowledge about soil biodiversity responses to forest perturbations need to be improved. In the framework of HoliSoils project, we established three study sites in oak-dominated forests located in Spain (*Quercus faginea*), France (*Quercus pubescens*) and Romania (*Quercus robur*) to study the impact of tree removal intensity on soil biodiversity.

The first results recorded in Spain pointed out a negative effect of both tree and slash removals whatever the soil biota group considered. In addition, the intensity of these effects increased with organism size. Next steps will include a comparison of response patterns between the three study sites and a survey of these responses over longer times.

Acknowledgments: This study was supported by the research project HOLISOILS, No. 101000289, funded by the European Commission's Horizon 2020 programme.

Keywords: *Holisoils project, Oak species, silvicultural interventions, soil biodiversity, soil fauna.*

THE ASSESSMENT OF THE INFLUENCE OF THE GROWTH REGULATOR *Reglalg* ON THE RESISTANCE OF BEECH SEEDLINGS OF „PLAIUL FAGULUI” SCIENTIFIC RESERVE

**Sfeclă Victor¹, Zdioruk Nina², Ralea Tudor², Platovschii Nicolai²,
Sfeclă Irina¹, Călugăru- Spătaru Tatiana²**

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Institute of Genetics, Physiology and Plant Protection of SUM, Chisinau,
Republic of Moldova*

E-mail: victor.sfecla@spp.utm.md

On the background of global climate changes with arid lasting periods there is an acute arising problem of forest, including beech (*Fagus sylvatica* L.) forests, degradation, not only in the Republic of Moldova, but throughout the European continent. In order to restore beech plantations in the Republic of Moldova, there were sown seeds from different growing zones (Băiuț, Suceava, Gilău, Hârlău (Romania); Chernivtsi; Ivano-Frankivsk (Ukraine), Ciorăști, Hîrjăuca and the Codrii, and Plaiul Fagului scientific reserves (Republic of Moldova)) in the „Plaiul Fagului” scientific reserve.

The purpose of these studies was to determine the most resistant genotypes to adverse environmental factors as well as the possibility of using the biological preparation *Reglalg* for reducing abiotic stress. The seedlings were processed during the vegetation period 2 times (on 20 May and 13 June), by spraying with a water solution with the concentration of the *Reglalg* of 0.5%.

The main criterion for assessing the state of beech seedlings was the index of chlorophyll, which was determined by a non-contact optical method. Total chlorophyll content in leaves was measured in field conditions using a portable chlorophyll meter: Chlorophyll Content Meter Model CCM-200 plus (Opti-Sciences, Inc). This instrument measures the optical absorbance in two different wavebands: 653 nm (Chlorophyll) and 931 nm (Near Infra-Red) providing CCI value).

The chlorophyll index made it possible to identify variants with the best integrity of the leaf apparatus in seedlings treated with *Reglalg*. Variants not treated with *Reglalg* had a chlorophyll index of 7.5-8.0 CCI, while those treated with *Reglalg* had 8.7-10.0 CCI. The use of the drug *Reglalg* can increase the chlorophyll index by an average of 13%. The options with the best integrity of the leaf photosynthetic apparatus and chlorophyll index are genotypes from the Chernivtsi and Băiuț growing zones.

Acknowledgments: This study was supported by the research project number: 20.80009.7007.07 „Determination of parameters characterizing the resistance of plants with different levels of organization to the action of extreme temperatures in order to mitigate the effects of climate change”, funded by National Agency for Research and Development.

Keywords: *chlorophyll index, Growth of Fagus sylvatica, Reglalg, Republic of Moldova.*

**NATURAL AREAS PROTECTED BY THE STATE WITHIN THE
FRAMEWORK OF THE CRIULENI FOREST ENVIRONMENT,
CHISINAU STATE FORESTRY ENTERPRISE**

Mocreac Nadejda, Stepaniuc Sergiu

*Technical University of Moldova, Faculty of Agricultural, Forestry and
Environmental Sciences, Department of Horticulture and Forestry, Forest
Ecosystem Management group (082.MS.), Chisinau, Republic of Moldova
E-mail: mocreacnadejda@gmail.com*

The activity of organization, management and management of natural monuments is carried out according to a strict protection regime that will later ensure the preservation of specific natural features. Depending on their degree of vulnerability, the population's access may be limited or prohibited. In accordance with the Law on the fund of natural areas protected by the state (no. 1538-XIII of 25.02.1998), there are 6 natural areas protected by the state within Criuleni Silvic Bypass. These are: 5 natural monuments - one of which is paleontological, two geological and two sectors with centuries-old trees, and a forest nature reserve - „Zoloceni”. The total area of these reservations according to the current layout (2022) is 139.72 ha, and the difference according to the law is an additional 5.3 ha. The natural monuments, namely those in the Geological and Paleontological category, are the Goian Paleontological Outcrop, the „La Humărie” Valley. The Goian Paleontological Outcrop is divided both in the Forest Fund with the area of 0.3 ha and in the territory of the Hrușova town hall - 0.7 ha of the rest of the area. This reserve is located 0.5 km from the intersection of the Leușeni-Chișinău-Criuleni highways, plot 72 subplot S (besides Hrușova town hall).

The „La Humărie” Valley covers an area of 66.6 ha, being larger by 2.6 ha (the development of 2012), this due to the limit of the corrected border of the forest body. It is located west of the village of Ustia and Răculești on the left slope of the Răut river. The Cave of Surprises is located 2 km northeast of Criuleni town, Zoloceni forest nature reserve, plot 23, subplot D, occupying an area of 0.4147 ha. This monument stretches over a length of 1,700 m, thus being the second longest cave in the country after the Emil Racoviță Cave. The cave, with a relative age of 11-13 million years, was accidentally discovered in 1970. Secular trees in the number of 10 specimens are found in the Halocea forest unit, plot 81, subplot V1 - 1 specimen, and another 9 specimens in the Stroi-Stînca forest unit, plot 47, subplot B, these trees are between 220-230 years.

The Zoloceni forest nature reserve, which covers an area of 71.8 ha, being larger by 2.8 ha (the arrangement from 2012), this is due to the corrected border limit of the forest body. The accessed reserve has in its composition forest species important both for scenery and for a rich biodiversity such as oak, ash, palinum, acacia, etc., aged between 128 years - landscaping unit 21 H on an area of 0.5 ha, 122 years – UA 21 W (18.60 ha) and 2-5-year forest crops.

Keywords: Criuleni Silvic Bypass, natural area protected by the state.

METHODS OF STIMULATE THE GERMINATION OF BLACK PINE (*PINUS NIGRA*) SEEDS

Sîngeorzan Steluta-Maria, Truța Alina Maria, Arion Iulia, Rebrean Florin, Chilat Mihail-Gabriel, Colișar Alexandru, Vlasin Horia Dan
*University of Agricultural Sciences and Veterinary Medicine,
Faculty of Forestry and Land Surveying, Cluj-Napoca, Romania*
E-mail: steluta-maria.singeorzan@usamvcluj.ro

The Black Pine (*Pinus Nigra*) belongs to the genus *Pinus*, which is one of the oldest genera. Today, more than 100 species belong to the genus *Pinus*, making it the richest genus of gymnosperms in the northern hemisphere. Black pine is used in plantations for its ornamental value, for timber production purposes, but especially in reclamation of degraded land.

The present work aims to apply methods to stimulate germination of black pine seeds. The study consists of using growth stimulators, following the germination faculty and germination capacity of *Pinus Nigra* (Black Pine) seeds under laboratory conditions, as well as seedling development.

Seeds of different origins were used, harvested from the counties of Bistrița-Năsăud, Cluj and Alba. The seeds were sown in containers with several wells and a single type of soil substrate (peat + perlite). Three variants were carried out for this method, in the first variant the seeds were soaked in distilled water, in the second variant the seeds were soaked in the growth stimulator *Sprintene* and for the third variant the seeds were soaked in the growth stimulator *Atonik*.

The highest germination rate was obtained in the variant with *Atonik*, both in terms of seed germination and seedling development, followed by the variant treated with the *Sprintene* stimulator. Seedling development, i.e. seedling height, was also influenced by provenance, but treatment and age also interacted on seedling development.

Although seeds kept under laboratory conditions retain their viability, the use of a growth stimulator is recommended to obtain the highest germination percentage. Plants treated with growth promoters are more advanced in growth and development, thus they positively affect vital plant processes and improve nutrient uptake.

Keywords: *Black Pine, germination, seeds, stimulator.*

CZU: 635.9:582.706(478)

CONTRIBUTIONS TO THE INTRODUCTION OF *ITOH-PAEONIA* IN THE REPUBLIC OF MOLDOVA

Sîrbu Tatiana

„Al. Ciubotaru” National Botanical Garden (Institute), SUM, Chisinau,
Republic of Moldova

E-mail: tatianaonica17@gmail.com

The achievements of the Japanese breeder Toichi Itoh, from the middle of the 20th century (1948), had a crucial impact on peony breeding. By successfully crossing the woody peony 'Alice Harding' with the herbaceous peony 'Kakoden', he obtained absolutely exceptional hybrids: the leaves are similar to the woody peony, and the habit is similar to the herbaceous peony. In the cold season of the year, the aerial part dies. According to recent classifications, they are attributed to *intersectional hybrids* (*Moutan* section x *Paeonia* section). Of the 36 seeds resulting from the hybridizations, 9 plants inherited the characters of the woody variety, and the rest of the seeds generated herbaceous plants. Toichi Itoh died in 1956, before being able to enjoy the results of his work. The researcher's work was continued by his assistant Shigao-Oshida, who in 1963 recorded the flowering of hybrids for the first time. The first generation of *Itoh-hybrids* was promoted by the American horticulturist Luis Smirnov, who bought Toichi Itoh's patent. Later, as a co-author, he patented the varieties 'Yellow Emperor', 'Yellow Dream' etc. After a break in peony breeding, in 1988, the American breeder R. Anderson obtained significant results, fascinating the world with the *Itoh-hybrids* created, declaring that these robust, exceptional varieties are the flowers of the future (Martin Page, 1997).

In order to enrich the *Paeonia* L. collection of the Laboratory of Ornamental Plants of the NBG(I) with new taxa, in the fall of 2018, four varieties of *Itoh-Peonies* (produced in the nurseries of Polish horticulturists) were procured: 'Bartzella', 'Cora Louise', 'Hillary', 'Prairie Charm'. In the private sector these peonies appeared 3-4 years earlier. Our main objective: to research the pace of development under the new conditions of growth. The 20-30 cm tall plants were received in containers, in a peat substrate. They were transplanted into soil in spring. After planting, they showed significant growth only in the third year. They are currently blooming abundantly, fruiting without producing seeds – a specific trait of *Itoh-Peonies*. Under the conditions of NBGI, the flowering period lasts 10-14 days and usually starts in the middle of May, in correlation with environmental factors (particularly – temperature). Budding and flowering occurs 8-10 days later than in woody peonies and goes in parallel to some herbaceous varieties. The propagation is vegetative, by division, just like herbaceous peonies. The studied peonies are resistant to pathogens and pests, to hydrological and temperature oscillations. We recommend using *Itoh-Peonies* in landscape design and for cut flowers and leaves.

Acknowledgments: This study was supported by the research project 20.80009.7007.14. „Research on mobilizing plant diversity with ornamental potential for ex situ conservation”, funded by National Agency for Research and Development (NARD).

Keywords: introduction, biological features, *Itoh-hybrids*, *Paeonia* L., Republic of Moldova.

LANDSCAPE ARCHITECTURE IN THE REPUBLIC OF MOLDOVA THROUGH THE PRISM OF SOME HISTORICAL PERIODS

Sfeclă Irina^{1,3}, Dumitraș Adelina², Sfeclă Victor³

*¹„Al. Ciubotaru” National Botanical Garden (Institute), SUM,
Chisinau, Republic of Moldova*

*²University of Agricultural Sciences and Veterinary Medicine,
Cluj-Napoca, Romania*

*³Technical University of Moldova, Chisinau, Republic of Moldova
E-mail: irinasfecla@gmail.com*

Through the research covered in this paper, an attempt was made to describe the landscape-architectural structure of some parks created on the territory of the Republic of Moldova in different historical periods, in terms of the influence of Russian architecture. The study was focused on some parks from the territory of the Republic of Moldova. The paper presents the history of the foundation, describes the landscape-architectural style and similarities between Russian landscape architecture and some parks created in the Republic of Moldova in several historical periods (the Period of Bessarabia as part of the Russian Empire (1812-1917); the Period of the Moldavian Soviet Socialist Republic (1944-1991); the Period of Independence of the Republic of Moldova (1991- present). The history of the foundation of the parks and the influence of Russian architecture were studied and analyzed on the basis of archival materials and new publications. We highlighted the old parks, created in the Period of Bessarabia as part of the Russian Empire, which are gems of the past, often remaining unknown. The green space units, a specific characteristic of the mentioned period, built on the territory of today's Republic of Moldova, are mainly the parks created around the mansions. During this period, the first urban public parks were built, such as: Ștefan cel Mare Public Garden. The green spaces created during this period are arranged in a landscape style with some elements particular to the regular style. All the parks on the territory of the Republic of Moldova, created during the Period of Bessarabia as part of the Russian Empire, which have been preserved until today, present a valuable cultural heritage. In the Period of the Moldavian Soviet Socialist Republic, in the context of industrialization and urbanization, the areas occupied by constructions increase, which accelerated the appearance of residential areas, which led to the occurrence of the need for the development of green areas. In this regard, parks are designed as connecting objects of the urban landscape, such as: green spaces of residential areas, garden of a neighborhood, an urban park. The architectural style used is mixed. Entrances, main walkways and central parts are approached in a regular style, while the other elements are laid out in a landscape style.

***Acknowledgments:** This study was supported by the research project nr. 20.80009.7007.14, funded by National Agency for Research and Development.*

***Keywords:** historical periods, landscape architecture, Republic of Moldova.*

THE SUITABILITY OF SOME SPECIES OF *SEMPERVIVUM* L. FOR THE GREEN SPACE ARRANGEMENT

Sfeclă Irina^{1,2}, Sîrbu Tatiana¹, Slivca Vasiliu¹

¹„Al. Ciubotaru” National Botanical Garden (Institute), SUM,
Chisinau, Republic of Moldova

²Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: irinasfecla@gmail.com

Sempervivum L. is a genus from the Crassulaceae family. It includes 40 species of evergreen, perennial, succulent, pubescent and monocarpic plants that grow up to 35 cm tall and develop stolons. The leaves are fleshy, ovoid or elongated with a sharp top, also shiny or matte, pubescent with glandular hairs and rarely hairless, ciliated on the edges, the base ones being disposed in a rosette, and the stem ones alternately. The rosettes are dense and have a diameter of 1-15 cm. The floral stem is pubescent, erect and unbranched. The inflorescence is corymbiform. It has hermaphrodite and actinomorphic flowers. The fruit is an elongated follicle.

Sempervivum genus is spread from Maroc to Iran, Turkey, the northeastern part of the Sahara Desert and the Caucasus, the mountains of Iberia, the Alps, the Carpathians and the Balkan Mountain range. It vegetates in the cracks of the rocks. In the spontaneous flora of The Republic of Moldova is found only *Sempervivum ruthenicum* Schnittsp. & C.B. Lehm., endangered species (EN), included in *The Red Book* of the Republic of Moldova (2001, 2015), *ex-situ* cultivated in the Institute of „Alexandru Ciubotaru” National Botanical Garden (NBGI). In addition to the species mentioned above, in the collection of the Ornamental plants' laboratory of NBGI, another 11 taxa (species and cultivars) are cultivated, such as: *Sempervivum globiferum subsp. allionii* (Jord. & Fourr.) 't Hart & B. Bleij; *S. arachnoideum* L.; *S. arenarium* W.D.J. Koch; *S. calcareum* Jord; *S. grandiflorum* Haw.; *S. montanum* L.; *S. ruthenicum* Schnittsp. & C.B. Lehm.; *S. tectorum* L.; *S. x hybridum* 'Red Papaver'; *S. x hybridum* 'Noir'; *S. x hybridum* 'Shadow'.

Specific taxons of *Sempervivum* are ornamental plants by habitus and plant. These forms, in combination with other plants, wonderful decorations in rock formations. They can be planted on walls, roofs, in pots or as a ledge plant. The advantages of using these plants are the fact that they do not have competition in the realization of the aesthetic effect and are resistant to the harsh conditions of the environment (frost, drought, poor soil, strong insolation etc.). Within the units of green spaces, the taxons of *Sempervivum* can go with many other plants, succulent plants inclusive, some of which are: *Sedum* L.; *Euphorbia* L.; *Rosularia* (DC) Stapf; *Dianthus* L.; *Tymus* L. etc. The companion species need to meet some requirements, such as: not to show vigorous growth so as to overwhelm or shade *Sempervivum* species; to have almost matching ecological requirements and to resist in the same cultivation conditions.

Acknowledgments: This study was supported by the research project nr. 20.80009.7007.14, funded by National Agency for Research and Development.

Keywords: green space arrangement, *Sempervivum* L., Republic of Moldova.

CONTRIBUTIONS TO THE STUDY OF THE SPECIES *DAPHNE MEZEREUM* L. IN THE REPUBLIC OF MOLDOVA

Tofan-Dorofeev Elena¹, Ionița Olga¹, Dorofeev Anton²

¹„Al. Ciobotaru” National Botanical Garden (Institute), SUM,
Chisinau, Republic of Moldova

²„Mihai Marinciuc” Theoretical High School with Real Profile,
Chisinau, Republic of Moldova
E-mail: tofanhelen@gmail.com

Daphne Mezereum L. is a glacial relict and is of particular scientific interest, given the fact that in the Republic of Moldova, it grows only in one place of growth: „Plaiul Fagului” Scientific Reserve being included in the Red Book of the Soviet Union as well as in all editions of the Red Book of the Republic of Moldova. At the same time, it is protected by the Law on the fund of natural areas protected by the State (1998), and it is mentioned in other monographic works that include studies of rare species such as: Rare plants from the spontaneous flora of the Republic of Moldova; Rare taxa from the flora of the Republic of Moldova; Preliminary Red List of vascular plants from the flora of the Republic of Moldova. Therefore, our goal was to monitoring and estimate the size of the population and study its dynamics in the site located in the „Plaiul Fagului” Scientific Reserve.

The range of the *Daphne Mezereum* species includes Europe, the Scandinavian peninsula, the Balkan peninsula, the Caucasus, Asia Minor as well and Western Siberia. In the Republic of Moldova, it grows only in the Northwest of the „Plaiul Fagului” Scientific Reserve in the composition of the sub-tree, in the understory of a humid forest of sessile oak with beech and hornbeam, alongside the small ravine on brown and sandy clay soil.

Daphne Mezereum is a Eurasian nanophanerophyte, mesophilic, mesothermal, and schiophilic species. It blooms in February-March until the leaves appear and are pollinated by bees, flies, and Lepidoptera. Fructifies from June to August and is propagated by seeds.

The data from the literature previously indicated the presence of a stable population with mature specimens and about 200 juvenile specimens, while as a result of our monitoring carried out during 2017-2023, we found that the number of individuals in the population of *Daphne Mezereum* drastically reduced. Currently it lists 6 mature specimens and only 21 juvenile specimens. Most likely, climate changes with acute moisture deficit in the last decades, prolonged drought, and extreme temperatures are some of the factors that led to the reduction of the species' population. Therefore, according to the IUCN criteria, it falls into the Critically Endangered category [CR]. A4ce; B2ab (i, ii, iii, iv); D.

Acknowledgments: This study was supported by the research project “Research and conservation of vascular flora and macromycobiota of the Republic of Moldova”, 20.80009.7007.22. funded by NARD.

Keywords: conservation, *Daphne Mezereum* L. rare taxa, Republic of Moldova.

FORECAST OF THE MAJOR INSECT PESTS SPECIES PRESENT IN THE CLUJ FORESTRY DISTRICT FOR THE YEAR 2023

**Varga Mircea Ioan¹, Tăut Ioan^{1,2}, Moldovan Mircea², Rebrean Florin¹,
Varvară Mihai^{1,3}**

¹*University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, Romania*

²*„Marin Drăcea” National Institute for Research and Development
in Forestry Cluj-Napoca, Romania*

³*„Iuliu Hațieganu” University of Medicine and Pharmacy Cluj-Napoca, Romania*
E-mail: mircea.varga@usamvcluj.ro

The phytosanitary condition of forests depends on the intensity of attacks produced by phytophagous insects, which lead to a significant percentage reduction in annual tree growth, a reduction in the percentage of timber and the destruction of fruit and seeds. The insect stings and chewing are gateways for phytopathogenic fungi, all of which contribute to the dieback of trees before they reach the age of exploitation. Besides phytophagous insects, other biotic factors (plant pathogens) and abiotic factors (climatic, soil and anthropic factors) play an important role in the evolution of forest health. Detection and forecasting of the insect forest pests plays an important role in forest protection works. The research was carried out in the production unit IV Baciș Șard located in the Someșan Plateau, „Dealurile Clujului and Dejului” sub-unit, on the technical left side of the Nadeș Valley, left affluent of the Someșul Mic, being managed by the Cluj Forestry District belonging to Cluj County Forest Administration, as part of the National Forest Administration, Romsilva. The purpose of this work is to establish the forecast of forest defoliators within the Cluj Forestry District for the year 2023, having as main objectives: field visits to some of the forest compartments within the Cluj F.D. and sampling (eggs, branches, pupae). Identification of pest species reported in the field, evaluation of population density for each identified species according to development stages (adults, eggs, larvae, pupae) and establishment of the probable defoliation percentage. Regarding the results, were: *Lymantria dispar* L.– spongy moth, *Tortrix viridana* L.– European oak leafroller or the green oak moth, *Operophtera brumata* L.– winter moth *Erannis defoliaria* Cl.– The mottled umber. From the performed surveys and the results obtained, it is observed that the defoliator *Lymantria dispar* L. is in the third and fourth gradation phases in all surfaces. From the studies and analyses carried out on the defoliator *Tortrix viridana* L. it is expected to produce very low defoliation in all the analysed areas. Surveys performed on *Geometridae* show that the probable percentage of defoliation produced by them is between 2.1-2.9% (very weak defoliation). As a conclusion, from the data obtained, following the analyses carried out, we can say that for the year 2023 the main defoliators of the deciduous forests encountered within the Cluj Forestry District will not cause significant damage, and the areas covered by the investigations were included in the supervision area.

Keywords: *damages, defoliating insects, deciduous forests, forest pests, forecast.*

MONUMENTAL TREES IDENTIFIED IN THE COUNTIES ON THE RIGHT BANK OF THE PRUT RIVER

Vasile Diana¹, Scărlătescu Virgil², Petrișan Any-Mary¹, Dumitru-Dobre Constantin¹, Ștefan Florin², Coman Simona¹

¹National Institute of Research and Development in Forestry, Brasov, Romania

²National Institute of Research and Development in Forestry, Mihaesti, Romania

E-mail: diana_vasile@ymail.com

Monumental trees are important elements for landscape design, by their presence in a certain place they can contribute to the creation of a positive city or village image, by influencing the tourists to visit a lot of places.

The researches took place in four counties from the right side of the Prut river, respectively in Botosani, Iasi, Vaslui and Galati.

The aim of this research is: identification and localization of the monumental trees of these four counties, to contribute to the inventory of monumental trees in Romania.

Sources of information for all the monumental trees has been bibliographic sources, inhabitants, local authorities, and the specimens found directly in the field.

For each monumental tree was recorded relevant information, respectively: tree localization by GPS), morphology, physiological and biomechanical aspects and the state of health. To establish tree age, it has been discussed with the inhabitants or with local authorities for estimated, not to use the Pressler drill, to avoid the extraction of the increment core, in order not to damage the trees

The inventory identified 86 specimens, belonging to 20 different genera, 84 being deciduous trees and two resinous trees. The most numerous species are *Quercus* sp. with 36 individuals, *Populus* with 14 specimens and from the other species there were identified only 1 or 2 individuals, except genera *Aesculus* and *Morus* with 4 specimens.

More than a half of the identified monumental trees are in a good and very good health status. These inventoried monumental trees represent a part of the county heritage that could be useful in the context of the tourist visitation.

Acknowledgments: This study was supported by the research project number 19070505 „Health status and conservation of monumental trees in Romania in the conditions of climate change”, within the BIOSERV program and project number 23090301 „Assessment of specific, structural and functional diversity in natural and quasi-natural forests to protect biodiversity in the context of climate change” within the FORCLIMSOC program, funded by the Romanian Ministry of Research and Innovation.

Keywords: diameter, health, height, measures, monumental tree, species.

CZU: 639.371:597.552.5

DETERMINATION OF BIOGENIC CAPACITY ON FĂINA-MIRAJ SECTOR OF VASER RIVER IN ORDER TO INCREASE THE SALMONIDS POTENTIAL

Vlasin Horia-Dan, Danci Cristian, Sîngeorzan Steluța-Maria

*¹University of Agricultural Sciences and Medicine Veterinary Cluj-Napoca,
Faculty of Forestry and Land Surveying, Romania*

E-mail: horia.vlasin@usamvcluj.ro

The purpose of the present study is to determine the biogenic capacity and the salmonoids potential of Făina-Miraj sector of Vaser river in order to increase the livestock by population and river-bed construction works.

The main objectives of the study aim to establish the real live stock on the studied river sector, the biogenic capacity calculation, to determine the existing salmonoids potential and proposals for the increase of salmonoid productivity.

The researches have been conducted on Vaser river in Maramures Mountains Natural Park, Maramures county, Romania, on a sector of 4.2 km. The determination of the biogenic capacity was established according to the method elaborated by National Institute for Research and Development in Silviculture „Marin Drăcea” Bucharest, analysing the abiotic, biotic and anthropic factors which influence the salmonoids production.

After analysing the field data, we established a biogenic capacity of 68, thus, the evaluation class on the investigated sector being VII, a class belonging to the category of rich waters. The established salmonoids production is 19.6 kg/km of river.

The interpretation of data and the field observation result in a better understanding of the present situation, offering information on salmonoids biodiversity on the analysed river sector and the present situation of the river bed construction works. All these represent a starting point in order to increase the salmonoids production by proposing the building of floored waterfalls, anchored trees placement, small lakes for fry, and juvenile trout population.

The river bed construction works, salmonoides fry introduction and river protection represent premises for the increase and amelioration of salmonoides population, of the ecosystem they belong to, which, in time, determine a substantial economic contribution by selling fishing authorizations and also by developing zonal tourism, by promoting nature and its resources long-lasting management.

Keywords: piscicultural stock, river bed construction works, salmonoids potential.

SESSION III - ANIMAL HUSBANDRY AND AGRI-FOOD SECURITY

CZU: 636.52/.58.087.69

PERFORMANCE AND EGG QUALITY OF LAYING HENS FED DIETS CONTAINING FEATHER MEAL

Caisin Larisa, Cara Alla

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: larisa.caisin@mpasa.utm.md

Poultry farming in Moldova is one of the most important sectors of agriculture. Industrial poultry farming allows for the production of high-quality products with high feed efficiency. Modern industrial poultry farming utilizes highly productive hybrid poultry, which places increased demands on proper nutrition.

The present study was conducted at an industrial poultry farm to investigate the impact of feather meal added to the diet on the productivity and quality of eggs in laying hens at 34 weeks of age. In total, 1000 Hy-Line W-36 laying hens were housed in cages across six tiers. According to the research findings on the use of feather meal in the composition of feed for laying hens, it was observed that its utilization contributed to an increase in the productive qualities of the birds.

The results indicated that the productivity indicators in terms of egg production, egg weight, and egg white mass were influenced by the inclusion of feather meal at levels of 2% or 3.5% of the diet. The incorporation of feather meal into the diets of the hens led to an increase in egg weight by 1.29 grams (2.1%; $P \leq 0.05$) in Experimental Group 1, by 0.97 grams (1.6%; $P < 0.05$) in Experimental Group 2, by 0.83 grams (1.4%; $P \leq 0.05$) in Experimental Group 3, and by 0.75 grams (1.3%; $P \leq 0.05$) in Experimental Group 4, compared to the control group, where egg weight was 7.87 grams.

Thus, our study revealed that the addition of feather meal significantly improved egg production and egg quality in the experimental groups compared to the control group.

Keywords: egg, egg production, feather meal, feed, laying hens.

FEEDING THE BEES IN THE SPRING PERIOD

Eremia Nicolae¹, Coșeleva Olga¹, Macaev Fliur²

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Institute of Chemistry, SUM, Chisinau, Republic of Moldova*

E-mail: nicolae.eremia@mpasa.utm.md, eremia.nicolae@gmail.com

The development of new treatments that stimulate the growth of bee families and contribute to increased productivity is important for the extensive development of the beekeeping industry. New-generation natural biostimulants are becoming increasingly important due to the search of growth stimulants for bee families and increasing their productivity making it an urgent problem.

The problem lies in expanding the range of biologically active, natural, environmentally friendly, stimulating substances that will increase the effectiveness of food supply in strengthening the immunity, vigor, reproduction, and productivity of bee families.

The aim of this research is to study the effect of the biostimulant CobalRibo on the growth, early development and productivity of bee families applied in bee feed during the spring period in the absence of a maintenance honey crop.

Four batches of bee families, three in each, were formed to carry out the experiment, following the principles of the analogy methodology in terms of honeycomb number, vigor, brood number, and the amount of honey in the hive. The bee families were given one liter each of a 1:1 mixture of sugar syrup with biostimulant - batch I - 2.0 ml/l, batch II - 3.0 ml/l, batch III - 4.0 ml/l, batch IV (control) - pure sugar syrup in the absence of a supporting honey harvest during the springtime. The biostimulant was represented by an aqueous solution of Hexaminecobalt (III) chloride and glycoside rebaudioside A.

The stimulant spring feeding increased the prolificacy of the queen bees and the number of the young brood by 7.92-24.03% compared to the control group.

The bee families of experimental batch II stored on average 34.1 kg honey, or 6.9% more than the the control batch IV, taking into account difficult climatic conditions.

During the spring period, stimulating bee supplementation with a mixture of 50% sugar syrup and a biostimulant of 1.0 liter per bee family every 6 days increased bee reproduction by 24.10% and honey production by 6.9%.

Feeding bees in the spring period, from April to the first harvest, with a mixture of 50% sugar syrup and 3.0 ml/l of CobalRibo biostimulant in the amount of 1.0 liter once in 6 days provides increased fertility rates of queen bees, brood number and honey productivity.

Acknowledgments: This study was supported by the research project no. 20.80009.5007.17 of the National Agency for Research and Development from Moldova (ANCD).

Key words: *bee families, biostimulant, morphoproduktive indices, sugar syrup.*

FORMS OF AGRICULTURAL ENTREPRENEURSHIP AS A FACTOR OF INFLUENCE ON THE RISK STATUS OF ANIMAL GENETIC RESOURCES

Radionov Vladimir¹, Harea Vasili²

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Animal Breeding and Reproduction Center*

E-mail: vladimir.radionov@mpasa.utm.md

Over the years of market reforms, new land relations, various forms of ownership and agricultural entrepreneurship have formed in the economy of the Republic of Moldova. At the same time, the number of farm animals has been concentrated in an organizational and legal form - an „enterprise”, with the rights of a legal entity or individual to independently determine the types of activities, the volume of production, based on their own interests. In the country's official statistics, three categories are distinguished: 1) agricultural enterprises; 2) peasant (farm) farms; 3) households of the population. Studying the consequences of such changes is a necessary condition for taking adequate actions aimed at preserving the genetic diversity of local breeds and populations of animals of different species. Because their diversity ensures the flexibility and sustainability of production systems in the face of climate change, the emergence of new diseases, shortages of feed sources and changing market demands. In the context of the necessary implementation at the country level of the Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration on Animal Genetic Resources, the relevance of the study increases significantly. The purpose of the study is to identify the most essential features and characteristics of the indicated enterprises of three categories, as well as the trends in their development and the consequences of the impact on the genetic resources of animals of the five main species (*Bos taurus taurus*, *Sus scrofa domestica*, *Ovis aries*, *Capra aegagrus hircus*, *Equus caballus*).

Based on the results obtained, it is concluded that over 30 years of reforms, livestock farming has not received proper development in any organizational and legal form of management. Negative trends persist and, moreover, have taken on a landslide character. Animal genetic resources remain under threat.

Key words: entrepreneurship, livestock farming, genetic diversity, genetic resources, factors, reforms.

CZU: 636.4

THE SCIENTIFIC APPROACH TO SWINE BREEDING BASED ON QUANTITY INCREASE AND QUALITY IMPROVEMENT OF PORK MEAT

Rotaru Ilie

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ilie.rotaru@mpasa.utm.md

In this paper we present new scientific results, made between 1991-2003 which consist of developing hybridization, emerged and maintained through the growth of new meat crossbreeds, evaluate the effect of increasing body weight on swine slaughtering and the use of hybrid swine for qualitative meat production.

The research results contributed to new concept development, according to which the quality and quantity improvement of swine meat comes from the heterosis effect, achieved by combining high-performance genetic types, and by the meat forming process on body mass dynamics.

Therefore, it is proven that the body mass optimization through slaughtering, is carried out by the meat quality and quantity, based on carcass formation process.

In this way, we can establish the optimal animal weight through quantity and quality of muscular and fat tissue, and intramuscular fat that forms technological, sensory qualities and meat freshness.

Key words: breed, casing, genotype, heterosis, hybrid, swine, spore, meat, slaughter.

VALUATION OF BY-PRODUCTS IN THE BUTTER MANUFACTURING PROCESS

Chițanu Ana

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ana.chitanu@mpasa.utm.md

The milk sector has seen important changes in recent years. Marked by a strong decline, mechanisms are being developed to revive the livestock sector - the main supplier of raw materials for the milk industry, but it is also investing in various modern technologies that allow to use all the nutrients from the industrial by-products as efficiently as possible. Currently, the non-fat fraction of milk is insufficiently utilized in food. It is considered that only 70% of milk proteins and lactose are found in finished dairy products, and the rest are intended for animal feed, transformed into technical products or discharged into waste water. Recent concerns have been directed in the direction of perfecting the procedures for obtaining proteins in a form as pure as possible and with a reduced degree of denaturation. Thus, there is an increase in consumer interest in dairy products with a lower lipid content and, therefore, with a reduced energy value, where milk proteins and lactose represent the basic components. There are many products obtained from non-fat dry substance of milk by-products and from non-cholesterol vegetable fats that are intended for a dietetic or special diet.

Among the main technological processes that take place in the butter industry, two secondary products stand out: skimmed milk - resulting from the separation of cream from milk and buttermilk - resulting from the manufacture of butter from cream. In the production of one ton of butter, up to 20 tons of skimmed milk and 1.5 tons of buttermilk are obtained.

Currently, there is a great concern worldwide for a useful use of useful substances from by-products resulting from the butter industry, emphasizing their valorization in human nutrition. Advances in scientific research have made it possible to re-evaluate the nutritional value of these by-products, which has been unjustifiably discredited. Modern, non-conventional technological processes have approved a rigorous and efficient separation of the components of secondary products and therefore a good processing, preservation and presentation of them.

The purpose of the work is to highlight the by-products from the processing of milk into butter, to study the methods of reduction, minimization and their rational valorization.

Keywords: *by-products resulting, buttermilk, butter industry, milk industry, raw materials skimmed milk.*

CRYOPRESERVATION OF BOAR SPERM

Cibotaru Elena¹, Darie Grigore², Djenjera Irina²

¹*Technical University of Moldova, Chisinau, Republic of Moldova*

²*Scientific-Practical Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine, Maximovca village, Anenii-Noi district*

E-mail: elena.cibotaru@mpasa.utm.md

At present, it is recognized that the most effective method of reproduction of farm animals is their artificial insemination. That is why in recent years, especially after the development of the methods of conserving the semen in different species of animals, a series of scientific works have been published in this field. An essential scientific contribution in solving the problems of reproduction and artificial insemination in farm animals were also many scientists in the field. As a result, different medium for diluting sperm, conservation technologies and equipment for inoculation of preserved semen were developed.

In pigs, due to the biological specificity of boar sperm, the artificial insemination of sows with sperm preserved by refrigeration and freezing, there are still some controversial and still unresolved issues on a global and national level. Among them, we should mention the low level of the fecundity percentage of the sperm preserved by refrigeration or freezing, the variability of the physiological indices of the male sperm depending on the factors of the environment, age and the technologies of growth and exploitation.

The biological material used is sperm collected from boars. Harvesting was carried out by the manual method. Sperm with a mobility of not less than 75% and a concentration of 0.2 billion ml were taken for processing. The CL preparation was introduced into the composition of the LGJ medium in a concentration of 0.6%. The packaging was carried out in the form of pastes (granules) of 0.2 ml in liquid nitrogen (-196 degrees). Sperm mobility was determined immediately after collection, after dilution, after refrigeration and after resuscitation, using the CEROS computerized program. Sperm viability was determined after resuscitation at a temperature of +37 degrees with intervals over every hour until the minimum percentage of mobile spermatozoa was obtained. Cryopreservation of pig sperm is still rarely used in the artificial insemination industry due to the low percentage of fecundity after resuscitation. The research carried out for the purpose of freezing the sperm of the male was meant to meet several goals, namely to establish the efficiency of the freezing by using several media intended for the dilution and freezing of the seminal material. The results of the research demonstrated that the mobility of spermatozoa after resuscitation was 41.0%, spermatozoa with progressive movements 21.3% and the viability after 4 hours of storage of spermatozoa at + 37 degrees C of 8.0+4.2, spermatozoa with progressive movements of 2.0+1.0 compared to the control group 25.5+1.7, 10.0+1.0, consecutively when the sperm was diluted with GH \bar{T} S medium.

Keywords: boar, concentration, diluent, environment, freezing volume, mobility, preservation, refrigeration, spermatozoa.

CZU: 614.31:637.52

TRACEABILITY OF PORK PRODUCTS

Bivol Ludmila, Caisin Larisa, Andreev Corina

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ludmila.bivol@mpasa.utm.md

The food industry is becoming increasingly interconnected and global, with food production and distribution systems relying heavily on each other. In addition, previous occurrences of food safety crises have drawn attention to the importance of ensuring the quality and safety of our food. The ability to track food throughout the supply chain is vital for both industry and decision makers in the event of a critical situation requiring a food recall.

The design of an information system that monitors traceability in meat production has a significant impact on the technologies used in the manufacture of meat products. The main purpose of traceability systems is to ensure the quality of implementation of meat products, thereby ensuring food safety and food quality for consumers. By doing so, consumers can enjoy healthy and safe food, and the risks associated with consuming products that are of poor quality can be reduced to acceptable levels or even eliminated altogether.

Traceability plays a crucial role in the trust between traders and consumers regarding the supply of product safety, quality and authenticity. The concept of authenticity verification stems from the requirement to ensure compliance with food standards and labeling laws and to identify cases of food fraud. As a result, different techniques have been established to confirm adherence to the legal rules regarding the naming of food products, the declaration of ingredients and their quantities, the information provided about the processing and the treatment claim of the food, as well as the activities done regarding the production and the geographical origin.

Traceability must be implemented in a way that meets industry standards and uses information encoding technology to make it easily accessible.

Acknowledgments: It was carried out in the framework of the project: „Predictive approaches to increasing the quality of skills in higher agricultural education based on partnership with the business environment”, with code NR.20.80009.0807.41., contracting authority: National Agency for Research and Development.

Keywords: *food quality, pork meat, traceability, safety.*

GENETIC DIVERSITY AND PHYLOGENETIC RELATIONSHIPS OF ENDANGERED GREY STEPPE AND PINZGAU CATTLE BREEDS

**Davidescu Madalina-Alexandra¹, Dobos Bogdan Iosif², Simeanu Daniel¹,
Panzaru Claudia¹, Creanga Steofil¹**

¹*University of Life Sciences, Faculty of Food and Animal Sciences, Iasi, Romania*

², *Gheorghe Asachi” Technical University, Faculty of Material Science and
Engineering, Iasi, Romania*

E-mail: mada.davidescu@gmail.com, mada.davidescu@uaiasi.ro

This study aims to augment the existing body of literature concerning the genetic diversity and phylogeny of the Romanian Grey Steppe and Pinzgau cattle.

Podolian cattle breeds, originating from the rugged and diverse landscapes of Eastern Europe, have long been recognized for their remarkable adaptability and historical significance in agriculture. This cattle group include breeds like the Ukrainian Gray, Moldavian, Hungarian Gray, and Romanian Grey, renowned for their ability to thrive in harsh environmental conditions. Originating in the Podolian region of Eastern Europe, these cattle have played pivotal roles in the agriculture sector.

Podolian cattle typically exhibit a robust build, medium to large size, and gray or grayish-white coats with distinctive darker pigmentation around the eyes, muzzle, ears, and hooves. They are known for their lyre-shaped, forward-curving horns, which add to their unique appearance.

The Romanian Grey Steppe cattle breed, classified also as one of Europe's most ancient native cattle breeds, falls under the *Bos taurus primigenius* and shares a common ancestry with various other podolian cattle breeds. This breed possesses distinctive biological attributes that have allowed it to thrive as a native breed throughout history, displaying increased adaptability to harsh climates and resistance to diseases, as well as remarkable hardiness and longevity.

The Pinzgau cattle breed presents major importance in the zootechnical sector, being adapted for growth and exploitation in areas with altitudes between 400-1600 m, rich in precipitation and fertile natural meadows, having resistance and capitalizing feed with a high cellulose content very well.

The results of this research show that these two breeds belong to the wild ancestor *Bos taurus primigenius*, an important aspect for genetic conservation programs. Revised citations from the literature pertaining to endangered cattle breeds in Romania, including the Grey Steppe and Pinzgau, corroborate the presence of a reservoir of valuable genes within these breeds.

The conservation of these genes necessitates the application of various reproductive biotechnologies. The outcomes of this research have the potential to enhance the conservation program for this breed, offering contemporary insights into genetic diversity-an invaluable tool for safeguarding endangered gene pools.

Keywords: *cattle, genetic conservation, Grey Steppe, Pinzgau.*

QUALITY CONTROL AND EXPERTISE OF "LUCEAFĂRUL" CHEESE OF LOCAL ORIGIN

Balan Diana, Manole Mariana

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: diana.balan@mpasa.utm.md

Since ancient times, it has been known that a balanced diet is essential for long-term health. Hippocrates, considered „the father of medicine”, said: „Your food should be your medicine and your medicine should be your food” and this tendency to consume safe, harmless and healthy food is the most functional and especially important today. The Moldovan market represents a dynamically developing future prospect for the production and marketing of cheeses. The current situation on the cheese market in the Republic of Moldova is characterized by two main points: the saturation of the market with local cheeses, which are known and appreciated by consumers, and the development of the dairy products segment, which involves foreign production technologies. According to statistical data, the current average annual consumption of dairy products in the Republic of Moldova is about 180 kg/person, which is 20% less than the estimated physiological consumption of 227 kg/person. Cheese is one of the few consumer products that contains a large number of substances essential for life, such as: proteins and fats, mineral salts, fat-soluble vitamins. The digestibility of proteins and fats contained in cheese is 97-98%. Consumption of 100 g of cheese covers the minimum daily requirement of essential amino acids, calcium and about 1/3 of the daily human requirement of phosphorus.

In order to ensure that the quality parameters of food products are maintained within the limits imposed by the legislation in force, every food product is subject to extensive control before it reaches the consumer, which includes checking and ensuring traceability at every stage of the technological process, as well as carrying out laboratory analyses with favorable results.

The article presents the results of the study on the safety of the components of „Luceafărul” cheese, sold in the network of shops in Chisinau. The aim of this research was to control and assess the quality of „Luceafărul” cheese of local origin. It was established that the cheese „Luceafărul” has indicators of high quality and safety, does not contain vegetable raw materials.

Key words: cheese, quality assessment, safety indicators, vegetable fats.

THE HARMLESSNESS AND QUALITY OF CONSUMABLE EGGS DEPENDING ON THE DURATION OF AVERAGE SHELF LIFE

Grosu Natalia

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: natalia.grosu@mpasa.utm.md

Final consumers are in a constant search for healthier alternative food, and this close interdependence is directly conditioned by its sanitation and trophic-biological quality.

As part of the food ration, eggs ensure a content rich in nutrients and caloric substances of strict necessity, being generally balanced and well represented in minerals, vitamins, proteins, etc., but they can also represent a danger for humans, in case of alterations in time during storage, transport and marketing. Therefore, in order to ensure the quality and safety of the eggs, the official sanitary-veterinary and technological prescriptions must be strictly followed throughout the manufacturing flow, the control of the raw and auxiliary materials, of the finished product, but also the observance of the conditions of storage and transportation, checking the quality of the products during storage to prevent the degradation of the products at certain predetermined periods, depending on the nature of the product and to obtain safe and high-quality products for consumption, with a nutritional value that satisfies the body's energy needs. The psychosensory value is that component of the nutritional value, which makes food products appetizing, determining their choice from those available at a given time. Caged eggs from commercial consumption from different producers served as the object of study in comparison with free-ranged eggs, qualitative indices being analyzed with the aim of highlighting domestic producers that produce high quality eggs.

The following parameters were taken into account: the external appearance of the eggs, the ovoscopic examination, the weight and thickness of the mineral shell at the pointed tip and at the blunt tip, the yolk index of the eggs, the size and mass of the dense and liquid white and yolk, the intensity of the color of the yolk, pH of the dense and liquid egg white and the yolk. After the analyzes were carried out, it was found out that both in terms of external and internal appearance, the eggs from Ltd. DANT-AGRO, Pîrlița village had the highest quality values and free-ranged eggs compared to the eggs produced by Ltd. „Rai Plai Avicola”, Briceni and I.M. „PB – NORD” Ltd., Edineț.

It is recommended to pay attention to the minimum durability date of the eggs, the packaging, the external appearance of the eggs, the manufacturer. In case of suspicion that the eggs do not correspond to the quality indices, the product quality certificate should be requested from the trading unit, if necessary, the competent organizations should be informed - the National Agency for Food Safety and the Agency for Consumer Protection and Market Surveillance.

Keywords: *eggs, egg white, yolk, quality, safety.*

DISCOVERY OF METHODS OF OBTAINING ECOLOGICALLY PURE BROILER CHICKENS MEAT

Kapitonova Elena

*Vitebsk State Academy of Veterinary Medicine, Department of
Specialized Animal Farming, Republic of Belarus*

E-mail: kapitonovalena1110@mail.ru

In the Republic of Belarus special attention is paid to increasing the poultry meat production, broiler chickens in particular. For further maintenance of the high-quality poultry meat we have developed, introduced into production and patented the mycotoxin adsorbent „Belasorb”. The purpose of our research was to establish the chemical composition of the broiler chickens muscle tissue for a possible increase in the nutritional and energy meat value when introduced into the diet „Belasorb” at various rates. Feed additive mycotoxin adsorbent „Belasorb” is characterized by a high sorption capacity for: aflatoxin B1 – 92.24 %, ochratoxin A – 77.41 %, T-2 toxin – 56.95 %, deoxinivalenol – 65.77 %, zearalenone – 43.00 %, fumonisin – 60.88 %. The main component is organo-mineral zeolite – tripoli. Scientific and economic experience was carried out in OAO Agrokombinat „Dzerzhinsky” on broiler chickens of the cross „Ross-308”. The duration of the experiment is 41 days. For experimental poultry „Belasorb” was given at a rate of 1 kg/t (poultry house No. 106), 2 kg/t (poultry house No. 104) and 3 kg/t (poultry house No. 108) of compound feed. The control poultry raised according to the generally accepted feeding technology (poultry house No. 105) was fed only standard compound feed. Research work was carried out according to approved methods using monographic, research and practical research methods. Protein mass fraction in the samples of pectoral muscle meat from poultry house No. 106 (11 kg/t) was higher – by 0.44%, from poultry house No. 104 (2 kg/t) – by 0.87% and from poultry house No. 108 (3 kg/t) – by 0.9% than from meat samples taken from control poultry house No. 105. In the samples of pectoral muscles from poultry of the control poultry house No. 105 2.96% of fat was recorded. In the pectoral muscles of broilers grown in poultry house No. 106, the indices decreased by 0.48%, in poultry house No. 104 – by 0.72% ($p < 0.001$) and in poultry house No. 108 – by 0.73% ($p < 0.001$) compared with the control indices of poultry house No. 105. The greatest decrease in indices was noted in the samples of femoral muscles obtained from poultry from poultry houses No. 104 and No. 108 – 0.94% ($p < 0.001$) and 0.93% ($p < 0.001$), respectively. Data on the chemical composition of the pectoral and femoral muscles in 100 g allowed us to calculate the nutritional and energy value of meat from experimental broiler chickens. The energy value of meat due to the reduction of fat level in the pectoral and femoral muscles was effective and amounted to 487.5-491.2 kJ. The calculated caloric content of meat improved the dietary properties of the experimental poultry product by 1.82-2.56%.

Keywords: broiler chickens, chemical composition, energy value, meat, nutritional value, thigh muscles, pectoral muscles.

FEATURES OF HONEY CONVEYOR IN THE ZONE OF INDUSTRIAL AGROBIOCENOSIS

Komlatsky Vasily, Leshchenko Igor

Kuban State Agrarian University, Krasnodar, Russia

E-mail: kubanagro@list.ru

The purpose of the research is to analyze the structure of honey plants in the zone of industrial agrobiocenosis.

The object of the study was the honey conveyor of the Krasnodar region. During the study, general methods of scientific knowledge were used, as well as abstract-logical, monographic, statistical and economic methods. The empirical basis that ensures the reliability of the conclusions is the statistical materials of the Russian state statistical bodies and the results of our own research.

The melliferous potential of Kuban is represented by wild representatives and numerous entomophilous agricultural crops. The „main” spring honey plant in the Krasnodar region is considered to be white acacia. Under favorable conditions, one bee colony produces 8-15 kg of honey. In the steppe zone, the gain of the control hive is 13 kg over 10 days of honey collection.

After pumping out May (black maple, hawthorn) and acacia honey, a period of maintenance honey collection begins, which is realized in the south of the country through the crops of sweet clover, phacelia, sainfoin and other entomophilous crops. Chestnut honey is exclusive, differing from other types of honey products with its unique aroma and dark color.

The basis of the honey production conveyor consists of numerous entomophilous agricultural crops, therefore the vector for the development of beekeeping in the region is the pollinating activity of bees. The main honey yield in the Krasnodar region comes from sunflower. Large areas of this oilseed crop make it possible to obtain large quantities of honey. At the same time, due to the shortage of bee colonies, under-pollination occurs, which leads to a decrease not only in yield, but also in the quality of seeds.

The vector for the development of beekeeping in the region is pollination activity. To increase the efficiency of pollination, it is necessary to increase the number of bee colonies, and to timely deliver bees to the beginning of flowering, use mobile honey-pollinating complexes.

Key words: beekeeping, industrial agrobiocenosis, honey conveyor.

**STUDY OF THE IMMUNOSTIMULATING ACTIVITY OF
LIPOLYSACCHARIDES FROM SACCHAROMYCES CEREVISI
BY ASSESSING THE EXPRESSION OF SURFACE MARKERS OF
DENDRITIC BLOOD CELLS**

**Krasociko P.A.¹, Goncearov A.E.², Dyj E.V.², Krasociko I.A.¹,
Ceaikovskii V.V.¹, Popova P.Iu.³**

¹*Academy of Veterinary Medicine, Vitebsk, Republic of Belarus*

²*Institute of Biophysics and Cell Engineering, NAS
of Belarus, Minsk, Republic of Belarus*

³*Federal State Budgetary Educational Institution of Higher Education,
Smolensk State Agricultural Academy, Smolensk, Russian Federation*

E-mail: krasochko@mail.ru

The purpose of this research is to evaluate the immunostimulating effect of lipopolysaccharide from *Saccharomyces cerevisi* by the expression of surface markers of immunocompetent cells.

Bacterial lipopolysaccharides of the producer strain *Saccharomyces cerevisi* are obtained by thermal hydrolysis in a 1% sodium hydroxide solution at 100 °C. Isolation of mononuclear cells from peripheral blood and obtaining immature DCs.

A sterile Ficoll-Pak gradient with a density of 1077 g/l was poured into 15 ml propylene tubes. Monocytes were isolated from the MPC fraction by the adhesion method.

A suspension of mononuclear cells (3×10^6 /ml) in a nutrient medium was poured into 12-well plates. The cells were incubated in a CO₂ incubator for 45 minutes to ensure complete adhesion of monocytes. After that, the medium with unattached cells was removed and the wells were washed from lymphocytes with DPBS. Isolated PBMCs were cultured in AIM-V nutrient medium with the addition of cytokines: 100 ng/ml GM-CSF and 50 ng/ml IL-4 at 37 °C in a humidified atmosphere with 5% CO₂ for 6 days.

Then the polysaccharides under study were added. The studies were carried out in 3–6-fold repetitions. On the surface of DCs, the expression of the following molecules was studied: class II GCS molecules - HLA-DR, costimulatory molecules CD80 and CD86, co-inhibitory molecules CD273, DC differentiation marker CD209.

To determine the expression of surface molecules, cells were incubated with monoclonal antibodies. It was found that the level of expression of CD80, CD86, CD273 and HLA-DR molecules on dendritic cells (DC) was 1.5-2 times higher ($p < 0.05$) when compared with the corresponding control group, which indicates the immunobiological activity of lipopolysaccharide from *Saccharomyces cerevisi*.

Keywords: *bacillus subtilis, dendritic cells, lipopolysaccharide, surface markers of immunocompetent cells.*

STUDY OF TOXICITY AND HARMLESSNESS OF SILVER-CONTAINING DRUGS

Krasociko P.A., Šienok M.A., Ponaskov M.A.

Academy of Veterinary Medicine, Vitebsk, Republic of Belarus

E-mail: krasochko@mail.ru

The aim of our research was to study the harmless (toxicity) of a constructed substance based on sodium dithiosulfate (I) in the presence of iodide ions, protargol and silver nitrate in comparison with protargol and silver nitrate.

To assess the harmless of silver-containing drugs on white rats, the drugs were administered once intramuscularly in a volume of 0.1 cm³/head.

The study of acute toxicity of sodium dithiosulfate (I) was carried out according to the "Guidelines for the toxicological assessment of chemicals and pharmacological preparations used in veterinary medicine" on clinically healthy white mice weighing 18-20 g. They were given a compound in the stomach on starch paste in a volume of 0.5 cm³ different doses of the compound - from 5,000,0 mg / kg to 30 000,0 mg/kg, starch paste was injected into mice of the control group.

It has been established that the silver-containing compound dithiosulfatoargentate (I) sodium in the presence of iodide ions is harmless and has no reactogenicity in relation to laboratory animals, its LD50 was 15,500 mg/kg of body weight, – the compound belongs to low-hazard substances (Class IV). Silver-containing preparations protargol, silver nitrate has reactogenicity at the injection site and at the same time are harmless to laboratory animals.

Keywords: harmless, protargol, sodium dithiosulfate (I), rats, silver nitrate.

FROM TRADITION TO TECHNOLOGY: HARNESSING PRECISION LIVESTOCK FARMING FOR ADVANCING RURAL ECONOMIES IN DEVELOPING COUNTRIES

**Gheorghe-Irimia Raluca-Aniela, Tăpăloagă Dana, Șonea Cosmin,
Ilie Lucian-Ionel, Tăpăloagă Paul-Rodian**

University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania
E-mail: drtapaloaga@yahoo.com

Rural economies in developing countries have long relied on traditional agricultural practices that, while steeped in tradition, often prove to be resource-intensive and less efficient. This inefficiency becomes particularly problematic as these regions grapple with the challenges of meeting the demands of a rapidly expanding global population. The urgency to find sustainable and efficient solutions for livestock farming in these areas cannot be overstated. Precision livestock farming (PLF) emerges as a revolutionary approach that holds the potential to redefine the livestock sector, utilizing modern technology to enhance animal management, health, and overall productivity. In essence, PLF is an innovative concept that draws from principles and technologies rooted in process engineering and information technology. Developing countries face a unique set of challenges, including the escalating demand for meat and dairy products as income levels rise and urbanization progresses. However, this heightened livestock production can exacerbate environmental issues, contributing to pollution and climate change. Precision livestock farming emerges as a viable strategy to efficiently utilize natural resources and mitigate environmental impacts by optimizing production systems and minimizing waste. Furthermore, the real-time data provided by PLF enables farmers to swiftly identify and address issues affecting animal welfare, thus raising standards in this regard. Additionally, PLF can optimize feed management, reducing costs and further mitigating environmental impacts. It is essential to acknowledge that as promising as PLF may be, it also comes with ethical considerations that demand careful attention. Animal welfare experts and policymakers have raised legitimate concerns about the potential risks and challenges associated with PLF technologies.

In conclusion, precision livestock farming presents a promising avenue for improving livestock management in developing countries. By harnessing the capabilities of sensors and data analysis, PLF equips farmers with the tools to make informed decisions, optimize production systems, and enhance animal welfare. Nevertheless, the ethical dimensions of PLF adoption and the need to ensure equitable access to technology remain essential considerations in the pursuit of sustainable and efficient livestock farming practices in developing nations.

Keywords: developing countries, precision livestock, resources.

EMERGING TRENDS IN ANIMAL BREEDING: LEVERAGING GENOMICS AND ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE GENETIC IMPROVEMENT

**Gheorghe-Irimia Raluca-Aniela, Tăpăloagă Dana, Șonea Cosmin,
Ilie Lucian-Ionel, Tăpăloagă Paul-Rodion**

University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania

E-mail: rodiantapaloaga@yahoo.com

The field of animal breeding is undergoing a profound transformation driven by the integration of genomics and artificial intelligence (AI) to achieve sustainable genetic improvement. Genomic selection (GS) represents a pivotal advancement that harnesses marker data to predict performance accurately, revolutionizing traditional breeding practices. GS not only expedites the rate of genetic progress but also offers a cost-effective alternative, fundamentally reshaping breeding programs. Its integration into cattle population evaluations exemplifies its transformative impact. The application of breeding technologies, including genomics and genome editing, holds the potential to enhance animal welfare by bolstering resistance to environmental stressors, minimizing invasive procedures like dehorning, and reducing animal suffering. However, the ethical assessment of these technologies' challenges conventional welfare perspectives, necessitating a paradigm shift in the evaluation of breeding practices. The pursuit of sustainable genetic improvement in livestock is attainable through meticulously crafted and precisely targeted breeding programs. These initiatives have yielded remarkable gains in animal productivity, notably in dairy, swine, and poultry systems, while concurrently diminishing resource requirements. Incorporating genomic selection into these programs has the potential to further economize by shortening generation intervals, enhancing selection accuracy at a younger age, and potentially supplanting traditional testing methodologies. Additionally, genomic mating (GM) has emerged as a more precise and reliable alternative to traditional pedigree information, rendering it particularly suitable for contemporary animal breeding and conservation endeavors. The preservation of distinctive genetic reservoirs, such as indigenous chicken populations, stands as a paramount imperative for enduring and sustainable genetic enhancement. In summation, the emerging trends in animal breeding are defined by the synergistic utilization of genomics and AI, aiming for sustainable genetic improvement. Genomic selection, innovative breeding technologies, ethical considerations, community engagement, and conservation efforts converge to shape the future of animal breeding. These advancements hold the promise of enhanced animal welfare, reduced costs, and the preservation of invaluable genetic resources, ultimately contributing to the realization of more sustainable and efficient breeding programs.

Keywords: animal breeding, genomic mating, genomic selection.

ASSESSMENT OF PHYSICO-CHEMICAL INDICES OF DIFFERENT TYPES OF HONEY

Mardari Tatiana

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: tatiana.mardari@mpasa.utm.md

The consumer market demand is for fluid honey, which is why honey is often liquefied by heating. The application of these procedures leads to some drawbacks: honey treated in this way will recrystallize in a very short time, high temperature treatment leads to pronounced degradation, fructose decomposes forming furfural acids whose presence is not desired in honey. The aim of the research is to study the quality of different types of honey according to organoleptic and physico-chemical indices.

The maximum water content is an index regulated by official standards, for all honey varieties the index is 20-21%. The average moisture content detected by the laboratory was 16.66%, acacia and lime honey had the same water content, with a lower percentage observed in polyfloral honey. Mineral elements in honey come from natural sources such as soil, plants, atmospheric environment. Plumb is a mineral element considered also toxic; therefore, it is indicated to be determined in honey, its content should not exceed 0.1 mg/kg. The data obtained from the determination of toxic metal Pb content in the studied honey indicate a lower average presence of <0.02 mg/kg.

The acidity of honey depends on the content of organic acids. The normative requirements for honey acidity stipulate a maximum index of 4.0-5.0 milli-equivalents per 100 g of product. The acidity indices in the honey studied ranged from 0.8-1.6 milliequivalents per 100 g of honey, the average being 1.30 milliequivalents per 100 g, falling within the normative requirements.

Oxymethylfurfural is also an important indicator of honey quality. In fresh honey oxymethylfurfural is practically absent, but after storage and processing this substance increases and thus influences the quality. Honey under examination was within the requirements according to the oxymethylfurfural content varying according to the assortment in polyfloral honey - 2.0 mg/kg, in acacia honey - 9.4 mg/kg and in lime honey - 8.1 mg/kg, on average 6.50 mg/kg in the honey studied. This value of the indecision of oxymethylfurfural is also accepted by FAO/WHO and Codex Alimentarius standards.

The dry matter in honey consists of sugars which constitute invert sugar and sucrose. The invert sugar content in honey must be a minimum of 70% and the maximum sucrose content 10% according to the regulatory requirements. Thus, the honey samples studied showed a sucrose content of 1.0% in polyfloral honey, 2.2% in acacia honey and 0.7% in lime honey. These values are within the limits of the regulatory requirements for honey.

Keywords: chemical composition, honey, organoleptic indices, oxymethylfurfural.

MONITORING OF PESTICIDE RESIDUES IN SUNFLOWER HONEY

Modvala Susana

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: susana.modvala@mpasa.utm.md

Nowadays, the beekeeping material is produced in an environment contaminated with various pollutants. The application of pesticides to crops can pollute the soil, air, water and also the flowers from which bees collect nectar for honey production, which can lead to the presence of those toxic chemicals in the food chain, affecting the health of both humans and bee families.

Determining pesticide residues in honey at the impact level is a difficult task because of the complex matrix of honey and its high sugar content.

Organochlorine pesticides are lipophilic substances and are therefore soluble and stable in beeswax. Thus, a quantity of these substances gradually migrates from the wax into the stored honey.

Honey samples from private apiaries in the North and South of the Republic of Moldova were used as research material. For the achievement of the proposed objectives, the tests for the detection of residues were carried out in the Laboratory for testing of agri-food products of the State Enterprise „Centre for Applied Metrology and Certification”.

The detection of pesticide residues was carried out by chromatographic method from honey samples exposed for analysis.

Physico-chemical indices of honeys from Sample 1 meet the legislative requirements for - Natural honey, but the water content in honey from Sample 2 is 2% higher than the norms in force, according to HG1191 of 23.12.10, RS, chapter III, point 8, subpoint b, de facto.

In the honey samples submitted for examination the residues of aldrin, dieltrin, endosulfan, Heptachlor and HCH were lower < 0.01 , which denotes that they are within the maximum permissible limits.

Honey is a product in demand by a wide range of people of different ages. For this reason, harmlessness is of great importance. This is also explained by the answers of the respondents who stated 17% that this product is offensive to pesticides, 3% that pesticides are harmless and 2% stated that pesticides have a neutral influence on honey.

A vast majority of farmers rarely use pesticides when growing sunflower crops, this is explained by the fact that the population is oriented towards consuming organic production that is beneficial to the body. This is also reflected in the statements of the interviewees who stated that 12% use pesticides in rare cases, 5% when necessary and 3% stated that they do not use pesticides in agriculture.

Keywords: *bee families, honey, pesticide residues, respondents.*

CHARACTERISTICS REGARDING THE QUALITY AND SAFETY OF SEMI-FINISHED MEAT AND BY-PRODUCTS SHREDDED AT THE LOCAL PRODUCER

Pîrlog Alisa¹, Curchi Diana², Pavlicenco Natalia¹

¹Technical University of Moldova, Chisinau, Republic of Moldova

²Republican Veterinary Diagnostic Center

E-mail: alisa.pirlog@mpasa.utm.md, alisa.pirlog@gmail.com

In the current market conditions, quality has become a determining element for satisfying consumer requirements. A special place is occupied by the manufacture of products with high organoleptic characteristics and which have a long sales perspective, without changing the quality of the product.

The aim of the research was to appreciate and evaluate the characteristics related to the quality and safety of semi-finished meat and by-products shredded at the local producer and made for public consumption.

Semi-finished meat and shredded by-products served as research material - Cighiri („Homemade Cighiri”), manufactured by two local producers and collected from the consumer network in a refrigerated state. The evaluation of the quality and safety parameters of semi-finished meat and chopped by-products - Cighiri made for public consumption, was carried out by evaluating two batches of „Homemade Cighiri” from two local producers.

The laboratory evaluations were carried out within the Republican Center for Veterinary Diagnostics, in the Laboratory for testing food products of animal origin, in accordance with the normative requirements in force for this category of food products. Therefore, the results of the research from the organoleptic point of view on semi-finished products from minced meat - Cighirii demonstrated qualitative indices of the external appearance, color, taste, smell, consistency, appearance in section, shape, etc., and which fall within the permissible limits of the acts regulations in force for this product category HG 624/2020.

So, it should be noted that the physico-chemical indices evaluated for Cighiri minced meat semi-finished products, presented appreciable and compliant results for both samples taken in the study, in accordance with the normative acts in force for the given products.

The evaluation of the microbiological indices of the semi-finished products from shredded meat taken in the study highlights the presence or absence of pathogenic germs such as: Coliform bacteria, Salmonella, the presence of *L. Monocytogenes* germs, *Esherichia coli*, the number of colonies at 30 °C, etc. Therefore, the results presented in relation to the microbiological indices evaluated in semi-finished meat and chopped by-products - Cighiri demonstrate that in the samples taken in the study no pathogenic microorganisms were detected that would endanger the health of the consumer and the reputation of the economic agent.

Keywords: indices organoleptic, physico-chemical and microbiological, meat semi-finished products and chopped by-products – Cighiri.

THE QUALITY INDICES OF FERMENTED FODDER FROM SMOOTH BROME *BROMUS INERMIS* 'IULIA SAFIR'

Titei Victor¹, Dumitriu Simona², Garștea Nina¹, Coșman Sergiu^{1,3}, Vacarciuc Elena², Mardari Liliana¹, Cozari Serghei¹, Coșman Valentina^{1,3}, Stavarache Mihai⁴, Miron Aliona¹, Gavrilă Cristian², Ababii Alexei¹, Teleuță Alexandru¹

¹„Al. Ciubotaru” National Botanical Garden (Institute), SUM,
Chisinau, Republic of Moldova

²Research and Development Station for Meadows, Vaslui, Romania

³Institute of Biotechnology in Animal Husbandry and Veterinary
Medicine, Maximovca, Anenii Noi, Republic of Moldova

⁴„Regele Mihai I” University of Life Sciences, Timisoara, Romania
E-mail: vic.titei@gmail.com

The main objective of this research was to evaluate the quality indices of fermented fodder, silage and haylage prepared from smooth brome *Bromus inermis* cultivar 'Iulia Safir', and prospect its use as forage for livestock.

The plant samples were collected in pre-flowering stage, from experimental field of the R&D Station for Meadows, Vaslui. The fermented fodder – silage was prepared from fresh mass, and haylage – from pre-wilted in the field plants, chopped and compressed in well-sealed glass containers, stored at ambient temperature (18-20°C). After 45 days, the containers were opened, and the sensorial, fermentation and biochemical composition indices were determined in accordance with standard laboratory procedures (SM 108) in the Institute of Biotechnology in Animal Husbandry and Veterinary Medicine, Maximovca.

The results revealed that fermented fodders are characterized by 345.6-570.0 g/kg DM with 1.64-3.93% lactic acid, 0.15-0.19% acetic acid, 11.47-11.77% CP, 2.51-2.86% CP, 35.03-35.27% CF, 44.13-44.39% NFE, 3.26-5.11% sugars, 0.93-1.20 % starch, 27.75-33.75 mg/kg carotene, 18.50-18.80 MJ/kg GE 8.50-8.51MJ/kg ME.

The smooth brome romanian cultivar 'Iulia Safir' could be used in the Republic of Moldova for the restoration of degraded permanent grasslands, as a component of the mix of grasses for the creation of temporary grasslands, the harvested green mass and prepared silage and haylage contain a lot of nutrients, which make them suitable to be used as a part of diverse diets for livestock.

Acknowledgments: This study was supported by the research project nr. 20.80009.5107.02 „Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”; nr.20.80009.5107.12 „Strengthening the food-animal-production chain by using new feed resources, innovative sanitation methods and schemes” and nr. 20.80009.7007.01 „The assessment of the spontaneous vegetation of the Republic of Moldova for the conservation and the sustainable use of plant diversity and plant genetic resources in the context of adaptation to climate change”, funded by National Agency for Research and Development.

Keywords: *biochemical composition, bromus inermis, haylage, nutritional value, silage.*

CURRENT FACTORS LIMITING AND CONTRIBUTING TO EXTENDING THE DURATION OF EGG PRODUCTION IN CHICKENS

**Petcu Igor, Balan Ion, Demcenco Boris, Osadci Natalia,
Roșca Feodora, Gramovici Ana**

*Public Institution Scientific-Practical Institute of Biotechnologies in Animal
Husbandry and Veterinary Medicine, Maximovca, Anenii Noi, Republic of Moldova*

E-mail: petcuigorr@gmail.com

Extending the life of laying hens seems to be the most relevant and logical approach to more efficient use of resources in industrial poultry farming. To achieve this goal, a multifactorial approach is required and, first of all, maintaining the physiological characteristics of the reproductive system of chickens, which is responsible for the laying of eggs by hens. Under the influence of a complex of stress factors, changes occur in the body of laying hens, as a result of which the feathers fall off, body weight decreases, involution of the reproductive system occurs, and egg laying stops. During molting, the following occurs: utilization and removal from the body of ballast substances that have accumulated, utilization of fat reserves, increased activity of the adrenal glands, thyroid hormones triiodothyronine and thyroxine, decreased activity of the gonads, luteinizing hormone, cessation of functions of the reproductive organs, increased levels of somatotrophic hormone in the blood and fabrics. Such changes lead to an increase in the rate of metabolic processes in chickens, an increase in protein synthesis necessary for the growth of new feathers and the production of eggs. At the same time, the breakdown of tissue proteins is stopped. In addition, the most important are the usefulness of the chicken's bones, which is the main reserve of calcium, and the exclusion of diseases associated with the functions of the reproductive system. All these problems associated with reproductive function will require solutions when extending the life of laying hens. The main method for solving this problem is forced molting as a biological feature of restoring productivity when using chickens in industrial poultry farming. The essence of forced molting is that an artificial molting is caused in the bird, which takes place in a shorter period of time than natural, and begins and ends almost simultaneously for the entire bird population. The purpose of this technique is to renew the bird's body through the utilization of fat accumulations, removal of ballast substances, reversible evolution and gradual restoration of the functions of the reproductive organs.

Forced molting in industrial poultry farming using chemical, mechanical, hormonal, stress-inducing and other non-natural methods is not attractive from the point of view of the welfare and protection of biodiversity of the animal world. Therefore, in the future it is unlikely that these methods will find wide application in economic savings.

Keywords: artificial molting, chickens, egg production, reproductive system, restoration of productivity.

SESSION IV - VETERINARY MEDICINE

CZU: 619:616.9-022.39

THE INCIDENCE OF ZONOOSES IN DOMESTIC ANIMAL CARCASSES AND THEIR IMPACT ON PUBLIC HEALTH

Antohiev Tatiana, Starciuc Nicolae, Osadci Natalia

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: nosadci@gmail.com

Transmissible animal diseases are a major problem in animal health and have a significant impact on human health and the economy. Epidemiological surveillance and prophylactic measures are essential for the prevention and control of these diseases. This article addresses the importance of epidemiological surveillance and prophylactic measures in the management of communicable diseases in animals.

Epidemiological surveillance is the systematic process of collecting, analyzing and interpreting animal health data to assess and monitor the evolution of communicable diseases.

The material for the investigations was taken from the carcasses of broiler chickens and some species of agricultural animals, refrigerated and frozen, some types of cheeses, placed in the marketing network of the Central Agricultural Market of the municipality of Chisinau. 157 samples of the following animal species were taken: sheep, pigs, horses, birds, salted Gingirica and sheep's cheese. The incidence of bacteria from the genera: *Streptococcus*, *Listeria spp.* and *Salmonella spp.*, was monitored. The detection and serotyping of bacteria from the genus *Salmonella spp.*, was carried out according to the international standard: SM EN ISO 6579-1:2017 - Microbiology of the food chain „Horizontal method for the detection, enumeration and serological typing of bacteria of the genus *Salmonella spp.*” were performed on special and selective culture media.

When examining smears made from cultures and stained Gram, the presence of short Gram-positive bacilli was found, without a characteristic arrangement, but „V”, „Y” or polysade groups can be observed.

As a result of the laboratory investigations, it appears that *Listeria* pathogenic germs predominated: *L. Monocytogenes* in 22 samples (34.54%), *L. Innocua* in 2 samples (3.14%). Pathogenic germs from the genus *Salmonella* were detected: *S. Enteritidis* in 2 samples (3.14%), *S. Typhimurium* - 2 samples (3.14%) and *Salmonella spp* - 15 samples (23.55%).

The results of the conducted research confirmed the presence and incidence of zoonotic pathogens, with a rate in frozen meat products of – 26.69%, in refrigerated meat of – 14.13% and in cheeses of – 1.57%.

The results obtained demonstrate that products of animal origin pose a major risk to public health, a fact that argues for the need to strengthen their monitoring measures in animal populations, as well as in products obtained from animals.

Key words: *bacterial flora, micromycetes, microbial colonies, nutrient media.*

THE PREVALENCE OF ENDOPARASITES IN STRAY CATS IN WESTERN ROMANIA

Badea Corina, Oprescu Ion, Herman Viorel, Imre Mirela, Sirbu Beatrice Ana-Maria, Sirbu Cătălin Bogdan, Morariu Sorin, Dărăbuș Gheorghe
University of Life Sciences „Regele Mihai I”, Timisoara, Romania
E-mail: corina.badea@usvt.ro

The purpose of the work was to identify endoparasites in the stray cat population in western Romania. The zoonotic character of some endoparasites of stray cats is very important in the transmission of the disease to children, but also to adults. The areas studied were inhabited by many small children but also adults.

The 117 stray cats taken in the study were females and males aged between 2 months and 10 years old. Faeces were collected from the areas where they defecate and from the park sandboxes where children play. The Willis-flotation method and the Baermann method were used to identify the parasites.

The results from these coproscopic methods indicate an overall prevalence of endoparasites of 41.02% (48/117). The identified parasites are zoonotic. The highest prevalence was identified in *Toxocara* spp. of 56.25% (27/48) followed by *Ancylostoma* spp. and *Isoospora* spp. 29.16% (27/48) and the lowest prevalence in *Dipylidium caninum* 8,33% (4/48). No *Aelurostrongylus* larvae were identified by the Baermann method. Mixed infections were found in five cats.

This study confirmed the presence of endoparasites in stray cat populations in western Romania. Some parasites are also zoonotic (*Toxocara* spp., *Ancylostoma* spp. and *Dipylidium caninum*), which means that the human population must be informed about this fact, and by regular deworming these endoparasites can be controlled. One measure to prevent contamination of sandboxes in parks is to cover them after they have been used by children.

Keywords: *endoparasites, stray cats, zoonotic.*

ULTRASONOGRAPHIC FEATURES IN PROSTATIC CYSTS IN ADULT AND SENIOR DOGS

Codreanu Andrei-Mario, Rosca Maria

University of Agronomical Sciences and Veterinary Medicine,

Faculty of Veterinary Medicine, Bucharest, Romania

E-mail: andreicod99@gmail.com

Prostatic disorders are common in dog adult as benign prostate enlargement in over two-thirds of these. However prostatic cysts are an uncommon complication of prostate enlargement due to not neutering the male dog. The prostatic cysts result from obstruction of prostatic ducts and fluid retention within the prostatic parenchyma. The para-prostatic cysts appear also as ultrasonographic fluid-filled structures, located within of the vicinity of the prostatic gland. The sizes of these cysts may differ from multiple millimetric cysts to one cyst large enough to be seen ultrasonographic as a „second urinary bladder”.

This occurrence is seen in adult dogs over the age of 7-8 years. The majority of the clinical signs are dominated by urinary disorders such as urinary retention, dysuria, or urination with blood (hematuria), other signs that are non-specific includes constipation, tenesmus, lethargy, anorexia or even locomotor issues such as hindquarter stiffness or lameness. The patients included in this study we're examined at the Clinic of the Faculty of Veterinary Medicine Bucharest and within a private veterinary clinic.

The study includes 9 dogs with ages ranged between 6 and 11 years old. The ultrasound examination for these patients from the study group we're represented by single or multiple lesions with a thin hyperechoic wall with anechoic content well delimited by the rest of the prostatic parenchyma.

Due to the specific physiology of the gland in this patients orchidectomy is followed after four-six weeks by reducing/absorption of these prostatic cysts.

Keywords: dysuria, prostatic cysts, ultrasonography.

**CAN IT MAY BE A MIXED NEOPLASIA WITH THE
COMPONENT OF BOTH CARCINOMATOUS MASTITIS AND
T-CELL LYMPHOMA WITH SKIN LOCATION - COMPARATIVE
STUDY**

Crînganu Dan, Crînganu Iuliana, Negreanu Raluca
*University of Agronomic Sciences and Veterinary Medicine,
Faculty of Veterinary Medicine, Bucharest, Romania*
E-mail: cringanudan@yahoo.com

Carcinomatous mastitis or the inflammatory mammary carcinoma is a malignant entity described in human, dog and cat in clinical oncology. It is characterized by a sudden onset, edema, erythema, peau d'orange, hardening and increased local temperature of the mammary gland, with or without the presence of mammary nodules. Blockage of superficial lymphatics with neoplastic cells is the cause of severe edema in the region. This type of cancer is characterized by an extremely fast rate of growth, development and invasiveness. Tumor cells break the basement membrane and invade regional lymphatic vessels and satellite lymph nodes.

Cutaneous T-cell lymphoma in the dog is a rare neoplastic condition with unknown etiology. The reaction at dermis level is characterized by infiltration of neoplastic T lymphocytes with a specific tropism for the epidermis and the ancillary structures. The abnormal division of lymphocytes present plaques or other lesions within the skin. It often involves enlarged satellite lymphnodes, edema, erythema and hardening of the malignant nodules.

The link between the immune role of the T-cells and the fulminant inflammatory reaction of the carcinomatous mastitis, frameable in the category of autoimmune diseases, is just one of the puzzles researchers are trying to solve in order to prove the connections between the two neoplasias.

One of the pieces is the role of cytokines, having value both in canine inflammatory mammary cancer and T-cell lymphoma.

The purpose of these small proteins that act as cell-to-cell messengers and play an important role within the immune system by stimulating or inhibiting cells in response to a range of stresses has been evaluated due to its valuable contribution as diagnostic biomarker, biological predictive marker and the therapeutic significance.

The purpose of this study was to characterize the two malignant pathologies clinically, histopathologically and regarding response to treatment in order to identify common ground.

Following the information obtained from the studies considered for this article, supplemented with personal case studies, the presence of a mixed neoplasm in the form of an undifferentiated carcinoma interspersed with T lymphoblasts is identified.

Keywords: *carcinomatous mastitis, cutaneous T-cell lymphoma, inflammatory carcinoma.*

PROSTATE PATHOLOGY IN DOGS - DIAGNOSTIC PROTOCOL AND STAGING

Crînganu Dan, Crînganu Iuliana, Negreanu Raluca

University of Agronomic Sciences and Veterinary Medicine,

Faculty of Veterinary Medicine, Bucharest, Romania

E-mail: cringanudan@yahoo.com

The increase in the incidence of prostatic diseases in dogs is determined, as in men, by exposure to internal risk factors (hormonal disturbances following the repeated administration of synthetic contraceptives, weakening of the immune system, genetic, hereditary causes) and external (viruses, exposure to radiation, pollution, inhalations or ingestions of toxic substances), as well as changing the food (industrial type, with numerous chemical additives) of the dogs.

Studies in dogs have revealed the fact that prostate tumors appear especially in medium and large breeds, aged 8-10 years. Castration at a young age had no effect on tumor development, as it is not dependent on hormonal stimulation. This type of cancer is fundamentally different in dogs compared to humans, where this condition is totally androgen dependent, and the removal of the hormonal stimulus (castration and treatment) or the use of estrogens increases the hope of survival to 60-70%. The study highlighted another aspect: the risk of developing prostate cancer in castrated dogs is higher than in non-castrated ones. The increase in the incidence of prostate cancer is determined by internal factors (weakening of the immune system, hormonal disorders, genetic mutations), external factors (exposure to radiation, pollution, viruses, inhalation or ingestion of toxic substances) and the way of life of the animal.

The clinical symptoms manifested in prostatic diseases are not sufficient to establish a definite diagnosis. Among the clinical examinations, the rectal examination should become a routine examination, in order to establish the existence of a prostatic condition. The diagnosis protocol must include a broad approach: ultrasound, urography, MRI and, above all, blood neoplastic markers (PSA and acid phosphatase), cytological evaluation and radiological examination. All the information collected in the clinical diagnosis stage plays an important role in evaluating the position and size of the prostate gland, and in particular for the identification of lymph nodal, pulmonary or bone metastases.

Therapies for prostate diseases in dogs (castration, pre- and post-operative chemotherapy, hormonal and immunotherapy) were carried out based on a standard protocol decided by the attending physician according to the nature of the disease, the TNM clinical stage, the patient's general state of health. The oncological treatment of prostate cancer in dogs is multimodal, it involves the combination of all means of conventional therapy, established according to the TNM, and the earlier the diagnosis, the greater the effectiveness.

Keywords: diagnosis, oncology, prostate pathology, staging.

THE ROLE OF CYTOLOGY IN THE DIFFERENTIAL DIAGNOSIS OF LYMPHADENOPATHIES IN DOGS

**Dinescu Georgeta, Gagniuc Elvira, Simion Andreea Alexandra,
Nicolae George Laurențiu, Țiu Raluca Elena**

University of Agronomic Sciences and Veterinary Medicine,

Faculty of Veterinary Medicine, Bucharest, Romania

E-mail: ginadinescu2015@gmail.com

Lymphadenopathy, localized or generalized, means an increased volume of the lymph nodes. It is a frequently encountered condition in dogs with complex etiology involving local or systemic dysfunctions. Lymphadenopathy is classified into reactive, inflammatory, primary tumors - lymphomas and secondary tumors - metastases. The present study aims to highlight the role of the cytological examination in the differential diagnosis of lymphadenopathy in dogs.

The study was performed on forty dogs diagnosed with lymphadenopathy in the Teaching Veterinary Hospital of the Faculty of Veterinary Medicine of Bucharest. The samples were obtained by fine needle aspiration technique (FNA), the smears were done by stretching technique, and May-Grunwald Giemsa staining was used. The smears were examined under an optical microscope with 200, 400, and 1000 magnification.

The vast majority (53%) of lymphadenopathies were diagnosed in dogs between 6 and 10 years of age, showing a predilection for adult animals. In this study, no significant correlation could be identified between the occurrence of lymphadenopathies and the breed or sex of the dogs. The most common lymphadenopathy were primary tumors, 24/40 cases being lymphomas (60%), followed by reactive hyperplasia, 7/40 cases (17.5%), secondary tumors-metastases, 7/40 cases (17.5%) and 2/40 cases (5%) of lymphadenitis, both pyogranulomatous. Regarding lymphomas, of the 24 diagnosed cases, centroblastic lymphoma was identified as the most common form (13/24), followed by lymphoblastic lymphoma (6/24), centroblastic-immunoblastic lymphoma (4/24) and immunoblastic lymphoma (1/24). Regarding lymphnodal metastases in our study, 5/7 were carcinomatous, associated with breast tumors, and 2/7 were associated with melanomas, oral and cutaneous.

The role of the cytological examination in the case of lymphadenopathy in dogs is essential because it can provide a quick, simple, minimally invasive and, in most cases, definitive diagnosis. All the cases included in the study had definitive diagnostics using cytology, confirming cytology examination's accuracy and specificity in evaluating dogs' lymph nodes.

Keywords: cytology, differential diagnosis, dog, lymphadenopathies.

EVALUATION OF MALIGNANCY CRITERIA THROUGH CYTOLOGICAL EXAMINATION IN CANINE MAMMARY TUMORS

**Dinescu Georgeta, Gagniuc Elvira, Pîrvu Adina-Mihaela,
Lăzărescu Teodora-Maria, Militaru Manuella**
*University of Agronomic Sciences and Veterinary Medicine,
Faculty of Veterinary Medicine, Bucharest, Romania*
E-mail: ginadinescu2015@gmail.com

Mammary tumors are the most common neoplasm in bitches. Almost half of them are malignant, their early diagnosis being extremely valuable and must always be corroborated with data obtained from the anamnesis and imaging examination. The aim of this paper is to identify the significant criteria of malignancy in mammary tumors and to provide a useful cytological diagnostic guide for clinicians and everyone approaching canine mammary gland oncology from a clinical pathology perspective.

Eleven mixed breed bitches were included in this study, aged between 7 and 13 years. On clinical examination, one or more mammary masses were observed. Cytological smears were made by imprint and/or scraping from both the surgically removed mass and the satellite lymph node, and stained with May Grunwald-Giemsa method. The presence and frequency of general and nuclear malignancy criteria was assessed for each case. General criteria of malignancy included hypercellularity, monomorphism represented by epithelial and/or myoepithelial cells, cytoplasmic basophilia and anisocytosis. Nuclear criteria of malignancy included anisokaryosis, high and variable N/C ratio, karyomegaly, prominent and variable in number and size nucleoli, coarse chromatin and atypical mitoses. Based on these criteria, a cytological diagnosis of malignant tumor was made.

In nine of the eleven total cases, the cytological examination was relevant and in the two remaining cases the smears were inconclusive for diagnosis, due to presence of cellular debris and severe cell necrosis. The highest incidence of mammary tumors was recorded in intact bitches (9/11), only two being neutered. Regarding tumor location, M4 was most frequently affected, and M1 the least affected. The most common criteria of malignancy were the high N:C ratio, anisocytosis, anisokaryosis, prominent nucleoli and coarse chromatin; they were most numerous and evident in secretory-type mammary tumors.

Cytological examination can be very useful in mammary pathology in bitches, having the advantage of a simple, fast and cheap technique. Knowing and recognizing the cytological criteria of malignancy in canine mammary masses is essential for establishing a cytopathological diagnosis. The correct identification of the cytological criteria of malignancy, both general and nuclear, can guide the early therapeutic approach of the patient after surgery.

Key words: *cytological examination, dog, malignancy criteria, mammary tumors.*

AN OVERVIEW OF RECENT DEVELOPMENTS IN GENETIC STUDIES OF CANINE CUTANEOUS MALIGNANT MELANOCYTIC TUMORS

Dobrin Ana-Alexandra, Militaru Manuella

University of Agronomic Sciences and Veterinary Medicine, Bucharest, Romania

E-mail: ana.dobrin@fmvb.usamv.ro

Canine melanocytic tumors are relatively common, up to 70% being malignant neoplasms. Melanomas account approximative 7% of all malignant tumors encountered in dogs and 11-27% cases involve cutaneous sites. In human medicine, melanoma is known as having one of the highest levels of mutations. Thus, the dog is regarded as a reliable model for plenty human malignancies, including melanoma. The current work summarizes recently described molecular genetic characteristics of malignant cutaneous melanoma in dogs, in order to provide additional support for further studies regarding carcinogenesis, diagnosis, prognosis and therapies.

Numerous relevant articles published in the last 20 years were consulted for the present study.

Using current technology advances, several studies about application of RNA sequencing, DNA amplification, qRT-PCR and improvement of immunohistochemistry have been performed for canine melanoma. The majority of investigations are focused on oral canine melanoma due to carcinogenetic similarities with rare oral human melanoma. In case of cutaneous melanoma in dogs, various researches showed that B-Raf proto-oncogene serine, GDP/GTP binding protein RAS, GNAQ and tumor suppressor Neurofibromatosis Factor 1 mutations are encountered infrequently compared to human cutaneous UV-induced melanomas. Nevertheless, similarities of the phosphoinositide 3-kinase/protein kinase B (PI3K-Akt) pathway in canine and human cutaneous melanoma have been demonstrated.

Moreover, cytological and histopathological resemblance between species was noted. In addition to Melan-A, HMB45, PNL-2, tyrosinase related protein 1 and 2 markers, immunohistochemical positivity for Ki-67, COL1, THBS2, chondroitin sulfate proteoglycan-4 (CSPG4), HMB-45 (Human Melanoma Black) antibodies was reported lately.

Latest findings revealed that canine cutaneous melanomas represent a relevant model for human melanomas, such as non-UV-induced types of dermal melanomas. Furthermore, genetic analyses are significant for new diagnostic and therapeutic approaches. Further studies need to be conducted particularly for breeds with genetic predisposition in developing cutaneous malignant melanocytic tumors.

Keywords: canine, cutaneous, genetic, melanoma.

CZU: 619:616.832-009-085:636.7

RECOVERY OF SPINAL WALKING IN PARAPLEGIC DOGS USING PHYSIOTHERAPY AND SUPPORTIVE DEVICES TO MAINTAIN THE STANDING POSITION

**Henea Mădălina Elena, Șindilar Eusebiu Viorel, Burtan Liviu Cătălin, Mihai
Iuliana, Grecu Mariana, Anton Alina, Solcan Gheorghe**

„Ion Ionescu de la Brad” University of Life Sciences, Iasi, Romania

E-mail: gsolcan@uaiasi.ro

Paraplegic patients have always been ideal candidates for physiotherapy due to their body's inability to recover on its own. Regardless of the cause that led to the onset of paraplegia (traumatic or degenerative), physiotherapy helps these patients with devices and methods designed to restore the proper functioning of their motility, as well as their quality of life.

A total of 60 paraplegic dogs without deep pain in the hindlimbs caused by discal hernia or thoraco-lumbar fractures underwent physiotherapy sessions: manual therapy (massage), electrostimulation (10–20 minutes with possible repetition on the same day), ultrasound therapy, laser therapy, hydrotherapy, and assisted gait in supportive devices or on treadmills to stimulate and relearn walking, which was the main focus of the study.

To maintain the standing position over time, we developed different devices adapted for each patient, depending on the degree of damage and the possible associated pathologies. Concurrent pathologies (skin wounds, urinary infections, etc.) were managed concomitantly.

After 125 to 320 physiotherapy sessions, 35 dogs (58.33%) developed spinal walking and were able to walk without falling or falling only sometimes in the case of a quick look with a lack of coordination between the thoracic and pelvic limbs or difficulties in turning, especially when changing direction, but with recovery of the quadrupedal position in less than 30 seconds.

Keywords: dog, paraplegia, physiotherapy, recovery of spinal walking, spinal cord injury.

CZU: 619:616.98:578.842.1:636.4(498)

EVOLUTION OF AFRICAN SWINE FEVER, IN ROMANIA, DURING 2017-2022

Herman Viorel, Popa Sebastian Alexandru, Imre Kalman, Dégi Janos, Iancu Ionica, Costinar Luminița, Hulea Anca, Gligor Alexandru, Pascu Corina
*University of Life Sciences „Regele Mihai I”,
Faculty of Veterinary Medicine, Timisoara, Romania*
E-mail: viorel.herman@fmvt.ro

African swine fever (ASF) is an infectious disease with particularly important negative socio-economic effects. ASF can affect both, domestic pigs (regardless of the breeding system) and various species of wild pigs (*Sus scrofa*). Clinically, the disease is characterized by hyperthermia, cardiovascular, respiratory and nervous disorders that are similar to those found in classical swine fever. From an anatomopathological point of view, African swine fever is primarily characterized by haemorrhagic diathesis lesions.

Currently, the disease evolves enzootically in sub-Saharan Africa (28 countries). In Europe, the disease is endemic in Sardinia, and in 2007 it also appeared in the Caucasian region (Georgia), in Armenia and Azerbaijan. Cases of ASF have been reported in Russian Federation, Ukraine, the Baltic countries, Poland, Hungary, the Czech Republic, Moldova, Romania (2017) and China (2018).

The aim of this study was to obtain a comprehensive image and to describe the current African swine fever situation in Romania, the economic effects and the pigs population damage caused by this virus in the last 6 years. The present study has been carried out on the existing pig population both in private households and in intensive breeding systems, in Romania, over a period of six years 2017-2022.

In order to obtain preliminary data on the epidemiological situation and the evolution of African swine fever in Romania between 2017-2022, report from the World Organization for Animal Health (<https://www.oie.int/en/home/>) as well as data taken from the National Veterinary Sanitary and Food Safety Authority (<http://www.ansvsa.ro/>) were analyzed. Moreover, other informations used in this work were processed from the National Institute of Statistics (<https://insse.ro/cms/>).

The first case of infection with the African swine fever virus in Romania was confirmed on 31.07.2017, in a household located on the outskirts of the municipality of Satu-Mare. From that moment until the end of 2022, according to the data transmitted by the World Organization for Animal Health, a number of 1.368.509 cases of infection with ASF virus were suspected in pigs. On the other hand, a number of 18.685 wild boars were infected with ASF virus between 2017-2022.

Despite all the efforts made by authorities, to combat African swine fever, the epidemiological data collected until the end of 2022 shows that the problem of this disease is not solved. This means that Romanian authorities must to intensify the fight against this disease and apply the following measures: killing the suspected pigs, destruction of corpses and compensation to affected owners.

Keywords: African Swine Fever, infectious disease, pig, Romania, wild boar.

CANINE CUTANEOUS MAST CELL TUMOR: DIAGNOSTIC METHODS AND PROGNOSTIC MARKERS

**Gagniu Elvira^{1,2}, Dobrin Ana-Alexandra¹, Pîrvu Adina-Mihaela¹,
Ciobotaru-Pîrvu Emilia¹, Militaru Manuella¹**

¹University of Agronomic Sciences and Veterinary Medicine,
Department of Pathology, Bucharest, Romania

²Department of Pathology, Synevovet Laboratory, Bucharest, Romania
E-mail: elvira.gubceac@gmail.com

Canine cutaneous mast cell tumor (CCMCT) is one of the most frequently diagnosed cutaneous tumors in dogs. The biological behavior of canine CCMCTs varies from benign to highly aggressive producing invasive growth and early metastasis. The study of prognostic factors represents one of the main research topics related to CCMCT.

Cytopathological diagnosis can be made by fine needle aspiration (FNA), by scraping technique or through imprint method from surgically excised pieces, using May-Grunwald Giemsa staining, then the cytological grading is established using the method proposed by Camus (2016). Histopathological examination can be performed from samples collected by incisional or excisional biopsy, then routinely processed. Additional Toluidine Blue and Giemsa stains can be used. Histological grade of malignancy can be established using two systems, the first one was proposed by Patnaik (1984) – 3 grades of malignancy: grade I (well differentiated), grade II (moderately differentiated) and grade III (poorly differentiated), and the second system is proposed by Kiupel (2011) – 2 grades of malignancy for CCMCTs, low and high grade. Immunohistochemistry (IHC) can be performed for immunolabeling the KIT receptor (surface growth factor receptor, encoded by the c-kit proto-oncogene). Cell proliferation markers in predicting CCMCTs prognosis are represented by mitotic index (MI), argyrophilic nucleolar organizer region associated proteins (AgNOR), proliferating cell nuclear antigen (PCNA) and Ki-67.

Cytopathological diagnosis of CCMCT enables the observation of characteristic metachromatic cytoplasmic granules, even in degranulated or anaplastic neoplastic mast cells. Camus's cytological grading classifies the canine mast cell tumors in well differentiated and poorly differentiated, these grades then being verified according to Kiupel's grading system. Histopathological examination of CCMCTs confirms the cytological findings, allowing the usage of histological grading and assessment of tumor margins. According to Patnaik, grade I CCMCTs's behaviour is benign, while grade III tumors frequently recur and metastasize. Immunohistochemical staining of the KIT receptor facilitates differential diagnosis of this neoplasm from other round cell tumors, especially in the case of poorly differentiated CCMCTs. Understanding its biological behavior and prognostic factors is crucial to establish treatment methods and therefore improving the quality of life of individuals with CCMCT.

Keywords: canine cutaneous mast cell tumor, cytological grade, histological grade, immunohistochemistry, prognosis.

MICROBIOLOGICAL RESEARCH OF HOMEMADE CHEESE IN VARIOUS COOLING PERIODS

Golban Rita

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: rita.golban@sasp.utm.md

The scientific research reflected in this study aimed to investigate the microflora of fresh homemade cheese in various periods of refrigeration according to the classic microbiological laboratory conduct. The evaluations of the recorded values regarding the number of microorganisms visualized under microscopy, the microbial colonies of *Streptococcus*, *Lactobacillus*, yeast cells and conditionally pathogenic species in this fresh food product and after some refrigeration intervals recorded microbiological indices of a normal bacterial microflora.

The researches characteristic to food microbiology are of public interest and allow us to note that the food product - homemade cheese obtained in homemade conditions from raw milk and kept in refrigerated conditions presents qualitative aspects and meets the microbiological requirements.

Important characteristics in the investigation of the refrigerated cottage cheese after 3 days of refrigeration regarding the microbiological investigation of the number of colonies according to the bacteriological conduct was observed in the species identified *Lactobacillus* with a number of colonies of 12 in the superficial microflora and the species *S. lactis* with 8 colonies detected in this superficial microflora, followed by yeast colonies with 5 colonies.

The bacteriological research related to the bacteriological investigations characteristic of the cultural aspects of the bacterial species developed in the dairy product cottage cheese during the period of 6 days of refrigeration determined a number of surface microflora colonies in the number of 16 microbial colonies of *Lactobacillus* species. Subsequently, 12 microbial colonies of the *S. lactis* species followed and 7 microbial colonies of yeasts, characteristic according to the appearance and identification of the species by microscopy performed from the microbial cultures.

Effective realization of all stages of isolation and identification of strains of lactic microorganisms is current for the purpose of their subsequent use in the composition of starter cultures for the manufacture of dairy products.

Keywords: *bacteriology, homemade cheese, lactobacillus, microflora, streptococcus.*

THE MICROBIOLOGICAL DIAGNOSIS APPROACH REGARDING THE MICROFLORA OF CANINE OTITIS

Golban Rita

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: rita.golban@sasp.utm.md

The current research regarding the diagnosis and identification of the microbial species that trigger otitis at dogs is of high interest. Otitis registered at canines demonstrated the involvement of a microflora of staphylococcal, streptococcal and bacillary nature, which due to the pathogenicity mechanism favored these infections frequently found at pets.

Microbiological investigations revealed the presence of *Staphylococcus aureus*, *Streptococcus pyogenes* and *Pseudomonas aeruginosa* species in simple microscopic visualization/Gram a number of 31, 28, 24 and 26, 21, 19 microbial cells, demonstrating a predominance of the *Staphylococcus aureus* species compared to the microbial species *P. aeruginosa*, which showed in all the microbiological research aspects lower values according to the number of germs regarding otitis at the investigated canines.

Regarding another canine breed investigated with bacterial otitis infection, important data characteristic of the Boxer breed dog were observed, where the values of the investigated species revealed 29, 24 and 26 specific microbial cells corresponding to the species *S. aureus*, *S. pyogenes* and *P. aeruginosa* at simple native microscopy and 24, 18 and 16 microbial cells specific to these microbial species.

The species isolated by simple native microscopy and after Gram staining in the Rottweiler dog breed determined values characteristic of the investigated species of 34, 31 and 21 microbial cells, compared to microscopy after Gram staining in this dog breed of 31, 24 and 22 microbial cells characteristic of the species investigated quantitatively specific to otitis infection samples by *Staphylococcus aureus*, *Streptococcus pyogenes* and *Pseudomonas aeruginosa*.

Therefore, interpreting in a quantitative aspect the prevalence of the characteristic species in otitis after the investigated microscopy, it is observed that the *S. aureus* species detected in these canine breeds investigated with otitis prevails in all investigated cases, compared to the *S. pyogenes* and *Pseudomonas aeruginosa* species, where the number of microscopic cells is slightly smaller, specifying important microbiological values.

Keywords: *canines, otitis, microorganisms, pseudomonas, staphylococcus.*

THE IMPACT OF THE ZOOBIOR REMEDY ADMINISTERED TO QUAILS ON THEIR HEALTH AND THE MARKERS OF THE CLINICAL AND HEMATOLOGICAL STATUS

Macari Vasile, Rotari Liliana, Rotaru Ana, Putin Victor, Mațencu Dmitrii, Pavlicenco Natalia, Nassar Ali Bilal

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: vasile.macari@sasp.utm.md

The research of BioR remedy on poultry production was carried out on 4 batches of quails, 50 birds each, in 3 of which the feed was supplemented with ZooBioR in different doses (10.0-15.0-20.0 mg active substance/kg feed), and the birds in the control group, which were on a regular diet.

The ZooBioR product induced lower body temperature and respiratory movements per minute. It was found that the number of erythrocytes (RBC) in quails, during the study, showed a tendency of decrease, an index which at the end of the study in the control group was higher by 1.5-3.3% compared to the experimental groups. It was further determined that at the end of the study, a unique trend of decreasing MCV persisted in all the birds included in the experiment. At this stage, the hematological parameter investigated in EG 1 and 2 also decreased compared to the control, which shows a decrease of 4.8-8.3%, results that denote positive tendencies, especially for the capillary flow. The content of mean erythrocyte hemoglobin (MCH) has a tendency to decrease in the first experimental stage. Thus, if in the control group MCH is on average 59.72 pg, it increases by 0.9-5.5% in young quails whose feed was supplemented with the ZooBioR product. During the research, the average erythrocyte hemoglobin concentration (MCHC) in quails, towards the first experimental stage has a tendency to decrease both in CG (by 19.2%, $p < 0.05$) and in EG by 7.8-9.8% respectively compared to the background. Also, at this stage, the MCHC content in the birds from EG, which benefited from ZooBioR, increased by 0.4-2.6% compared to the control, an undeniably positive phenomenon, revealing the intensification of hematopoiesis in the birds from EG 1 and 2. So, the index investigated in quails from EG 1 and 2 remains higher by 2.0-2.6% compared to the control group, and in EG 3 it does not differ from the control values.

It was established in the quails that benefited from ZooBioR a tendency to decrease leukocytes in blood, by 2.4-15.4% compared to the control group, a beneficial phenomenon, reflected in the decrease of the negative action of stress in the first months of egg laying. At the end of the study, the WBC level at CG shows a clear tendency of decrease by 17.2% compared to the previous values, while at EG, on the contrary, there is an increase in the investigated parameter, by 9.5-11, 9% higher than control.

Keywords: *body temperature, clinical status, erythrocytes, hematological status, hematopoiesis, leukocytes, ZooBioR product, quails.*

CLINICAL AND MAGNETIC RESONANCE ASPECT IN MIELOMALACIA IN DOGS – 6 CASES

Neagu Alexandru-Gabriel, Tudor Niculae, Vlagioiu Constantin

University of Agronomical Sciences and Veterinary Medicine,

Faculty of Veterinary Medicine, Bucharest, Romania

E-mail: neagualex29@yahoo.ro

Mielomalacia in dogs is a condition characterized by the softening or degeneration of the spinal cord tissue. Both clinical and magnetic resonance imaging (MRI) aspects are crucial for diagnosing and understanding myelomalacia in dogs.

The medical records of a series of 6 cases from the Faculty of Veterinary Medicine, Bucharest Emergency Hospital were included based on the history, clinical and magnetic resonance aspect.

The clinical presentation of the cases varies depending on the location and severity of spinal cord damage. Common clinical symptoms include weakness or paralysis in one or more limbs, loss of coordination, difficulty walking, pain, changes in posture, altered reflexes, such as exaggerated or diminished reflex responses and in severe cases, loss of bowel or bladder control.

Magnetic Resonance Imaging (MRI) is a key diagnostic tool for assessing myelomalacia in dogs. MRI provides detailed images of the spinal cord and surrounding structures, offering valuable insights into the condition. On MRI scans, myelomalacia presents as a localized area of softening/tissue damage within the spinal cord. These areas often appear as regions of hyperintensity on T2 images, indicating a lesion of spinal cord tissue.

Based on the history, clinical and magnetic resonance aspect 6 cases of dog myelomalacia are divided into: traumatic (3), degenerative (2) and vascular (1) myelomalacia with location of thoracolumbar spinal cord.

Prognosis for dogs with myelomalacia varies widely depending on the cause and the degree of spinal cord damage. In some cases, with prompt and appropriate treatment, dogs can regain some or all of their mobility. However, in severe cases or when the underlying cause is difficult to treat, the prognosis may be less favorable.

In conclusion, the combination of clinical evaluation and MRI imaging is critical for diagnosing myelomalacia in dogs accurately and guiding appropriate treatment decisions. MRI, with its ability to provide detailed anatomical information, plays a central role in understanding the extent and location of spinal cord damage.

Keywords: dog, imaging diagnosis, myelomalacia, MRI.

STUDY REGARDING THE PHYSIOLOGICAL VARIATIONS OF THE DIPSIC BEHAVIOR IN THE GESTATION PERIOD IN DOMESTIC CATS

Nicolae Simona, Codreanu Iuliana

University of Agronomic Sciences and Veterinary Medicine,

Faculty of Veterinary Medicine, Bucharest, Romania

E-mail: simona.calin93@yahoo.com

It is well known that the physiological status fundamentally influences the intake of nutrients and, implicitly, of water. Since the body's water requirement, under basal conditions, is directly proportional to the body surface and the intensity of metabolic processes, we can correlate gestation, as a metabolically demanding period, with the physiological variations of the requirements of water, which will invariably translate into changes in the dipsic behavior of this species. A group of 8 patients with healthy clinical status was formed, who were evaluated dynamically during the gestation period. The video monitoring of the dipsic behavior was carried out for each patient, in the second part of gestation (after day 35), for a period of 5 consecutive days. Following the corroboration and centralization of the data obtained through video monitoring, ethograms were drawn up for each individual. Regarding the dipsic behavior, the individual ethograms, included data on 4 ethological indicators, namely: the average number of waterings/24 hours, the average duration (in seconds)/watering session, the total time spent by the individual exhibiting dipsic behavior/24 hours, as well as, additionally, the average number of approaches to the water source, without showing dipsic behavior/24 hours. The mean values obtained for the study group were compared statistically (using the classic Student's t-test) with the mean results of a control group of 15 clinically healthy adults, of various ages (2-8 years old). Thus, in the case of pregnant patients, there was observed a statistically significant increase ($p < 0.05$) of the average number of waterings/24 hours, as well as in the average duration of a watering session, compared with the values obtained in the control group. At the same time, a distinctly significant increase ($p < 0.01$) of the average duration of the dipsic behavior manifestation/24 hours was observed, as a result of the simultaneous increase of the other two previously mentioned parameters. As concerning the average number of approaches to the water source, without showing dipsic behavior/24 hours, it was also increased, compared to the results obtained for the control group, but without statistically significance ($p > 0.05$). The increase of the four studied ethological indicators demonstrates that, in this species, pregnant patients show an increased water requirement, translated into an intensification of the dipsic behavior manifestation.

Acknowledgments: This study is part of the research carried out during the doctoral studies of PhD student Călin (Nicolae) Simona and will be widely presented in the doctoral thesis „Research on the physiological and pathophysiological factors involved in the modification of dipsic and urinating behavior in cat”.

Keywords: cats, dipsic behavior, ethological indicators, gestation, physiological status.

CZU: 619:616-092.19:636.4

NRF2 OVEREXPRESSION AND REDUCED P65 EXPRESSION IN INTESTINAL MUCOSA OF PIGS EXPOSED TO BLACK GRAPE POMACE POWDER

Proca Andrei Claudiu, Solcan Carmen

„Ion Ionescu de la Brad” University of Life Sciences, Iasi, Romania

E-mail: csolcan@uaiasi.ro

Grape and berry polyphenols have antioxidant effect through their ability to rapidly reduce reactive oxygen or nitrogen species (ROS/RNS), which are produced in high amounts during the inflammatory phase of chronic diseases. They also have protective effects against oxidative stress by inducing the activity of the enzyme glutathione S-transferase P1 (GSTP1) and the nuclear translocation of the transcription factor NF-erythroid 2-associated factor (Nrf2), which may actually be a more important antioxidant mechanism than direct ROS scavenging. Due to their well-known antioxidant effects and their high concentrations in many dietary components they have been increasingly studied for their effects on gut health. NRF2 is essential in the regulation of fundamental cellular, transcriptional and maturation events of cytokine storms. Thus, NRF2 is considered as a potential therapeutic target for various inflammation-related disorders.

The study was conducted on 20 male and female Pietrain pigs divided into 2 groups, control and experimental, reared from 120 to 180 days. The pigs in the experimental group received in their daily feed ration 1% polyphenol-rich black grape pomace powder. After slaughter at 180 days, samples were taken from the anterior third of the duodenum, jejunum, ileum, which were fixed with 4% buffered formalin, paraffin embedded, sectioned and stained with HE and immunohistochemically with Nrf2 and p65. Following IHC staining, increased expression of Nrf2 marker was found in the experimental group and reduced expression of p65. In the control group, p65 overexpression and Nrf2 reduction appeared. In conclusion, polyphenols in pomace powder from black grapes have a strong antioxidant effect activating the Nrf2 gene and reducing the proinflammatory activity of the p65 gene.

Keywords: antioxidants, grape pomace, intestinal mucosa, immunohistochemistry, pig.

CZU: 619:616.99:636.394(498)

PREVALENCE OF GASTROINTESTINAL PARASITES IDENTIFIED IN FRENCH ALPINE GOATS FROM WESTERN ROMANIA

Sîrbu Beatrice Ana-Maria, Oprescu Ion, Herman Viorel, Imre Mirela, Badea Corina, Sîrbu Cătălin Bogdan, Florea Tiana, Dărăbuș Gheorghe
University of Life Sciences „Regele Mihai I”, Timisoara, Romania
E-mail: jiteabeatrice@gmail.com

Animals products derived from their output are the main source of animal protein. They also play an important role in the country's economy. However, parasitism is a major problem limiting animal husbandry in most developing countries.

The aim of the present study is to determine the prevalence of gastrointestinal parasites in French Alpine goats from Western Romania.

A total of 267 goats, with ages between 6 months and 2 years were taken into study from June to August 2023. Two methods were used to detect the presence of parasitic elements: the flotation method and the sedimentation method.

The total prevalence of parasites was 87.6% (234/267). Four species of parasites were detected using the flotation method: *Eimeria* spp., *Moniezia* spp., strongylid eggs and *Nematodirus* spp. and no parasites were detected using the sedimentation method. Among the detected parasites, *Moniezia* spp. had the highest prevalence (68.2%), followed by strongylid eggs (12%), *Eimeria* spp. (5.2%), and the lowest prevalence was observed in *Nematodirus* spp. (2.2%).

The results of this study suggest a high prevalence of gastrointestinal parasite infestation, therefore effective control measures should be implemented to control the negative effects of gastrointestinal parasites on goats.

Keywords: endoparasites, goats, French Alpine.

SCREENING OF DILATED CARDIOMYOPATHY IN SENIOR DOGS

Serbănescu Diana, Codreanu Iuliana

University of Agronomic Sciences and Veterinary Medicine,

Faculty of Veterinary Medicine, Bucharest, Romania

E-mail: dianas95@yahoo.com

Dilated cardiomyopathy has emerged in the literature and news due to recent opinion-based journal articles and public releases from regulatory agencies. Dilated cardiomyopathy is frequently associated with a genetic predisposition in certain breeds of dogs and can also occur secondary to other diseases and nutritional deficiencies. Cardiac dilatation is the thinning of the myocardial walls and especially of the ventricular myocardium, in the vast majority of cases being the natural consequence of the presence over time of the factors causing hypertrophy. Any obstruction in the two circulations increases the pressure and leads to compensatory hypertrophy, then dilation. The most common mechanical causes occur in the lower circulation through various acute pulmonary diseases that prolong into subacute or chronic form. Static disease in the great circulation is represented by arteriosclerosis, atheromatosis, aneurysms, thrombosis, chronic hepatic or renal organopathies. Left or right atrioventricular insufficiency goes through the hypertrophy phase and then reaches dilation. Pathogenetically, there is a weakening, stretching and dystrophy of the myocardial fibers that can occur on all walls if the efforts imposed by infectious diseases, intoxications, deficiencies intervene at the same time, the reserve force of the heart being exhausted. Dilatations of the atria are rapid from the moment when obstacles appear in the atrioventricular transit due to their thin wall. Dilation of the right heart is the second most frequent after global dilation and results in blood stagnation in the spleen and liver (right heart safety valve). Dilation of the left heart occurs last and results in severe hypoxia with worsening of all general signs, including cardiac signs. This study includes a number of 13 dogs with their age ranging between 6 and 14 years, that we're examined at the University Emergency Hospital Prof. univ. Dr. Alin Birțoiu, Bucharest and within a private veterinary clinic in Bucharest. They have a prolonged pre-symptomatic phase of the disease, extending over years. The patient's echocardiography examen indicates a dilated heart, with thin hiperechoic walls, hypokinesia of the cardiac walls, increased telesystolic and telediastolic volume of the left ventricle and left atrium, reduced contractile substrate and interventricular septum. The aim of this study was the early diagnosis of one of the most common heart diseases in senior dogs - dilated cardiomyopathy characterized by chamber dilatation and myocardial systolic and diastolic dysfunction.

Acknowledgments: This study is part of the research carried out during the doctoral studies of PhD student Serbanescu Diana and will be widely presented in the doctoral thesis „Research on optimizing functional and imaging screening in degenerative cardiomyopathies in canine-senior and geriatric patients”.

Keywords: *cardiac dilatation, systolic and diastolic dysfunction.*

THE IMPACT OF THE ZOOBIOR REMEDY ADMINISTERED TO QUAILS ON THE MARKERS OF PROTEIC METABOLISM

Rotari Liliana

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: vasilie.macari@sasp.utm.md

Taking into consideration the beneficial properties of the ZooBioR product, an autochthonous remedy, acquired through modern technologies from *Spirulina platensis*, under the conditions of the Republic of Moldova, the impact of this product on health, and especially on the clinical and hematological status of quails, is of great interest. Our research was carried out on 4 batches of quails, of 50 birds each, in three of which the feed was supplemented with ZooBioR in different doses (10.0-15.0-20.0 mg active substance/kg feed), and the birds in the control group, which were on a regular diet. The quails taken in the research were similar according to: age, origin, body mass, physiological state. The obtained results prove that during the study, over a period of about 5 months, ZooBioR, tested on quails in zootechnical farm conditions, did not induce adverse reactions, deviations in the health and productivity of birds.

A clear tendency of increase of the total proteins in the blood serum was registered, with the average of 63.42 g/l in the control group, an increase of 9.8%, compared to the beginning of the study. In addition, the tested remedy induced lower values of total proteins, a phenomenon considered beneficial indicating an intensification of protein metabolism. In parallel, the ZooBioR remedy induced a clear tendency towards the end of the study to increase serum albumin by 5.0-9.1% compared to the control values, which justifies the aforementioned.

The investigation of serum urea highlighted several essential moments: a tendency to decrease with age, of 4.8% compared to the beginning of the study; the increase of the investigated parameter at the first research by 5.6-30.9% and at the end of the study in experimental groups 2 and 3, respectively by 20.0-32.6% compared to the control. The uric acid values showed an increasing tendency under the influence of the tested product, of 10.9-20.6%, and at the end of the study the increase was 34.1-51.2% compared to the control. A remarkable fact was also confirmed in the case of blood creatinine dosage, a parameter which under the influence of the ZooBioR remedy increased in the first experimental stage by 1.7-15.5% and respectively at the end of the study by 8.4-15.4% compared to the control group, a phenomenon that attests to the intensification of protein metabolism under the influence of the tested product.

In conclusion, we can state that the administration of the ZooBioR product does not negatively influence the health of quails and shows a beneficial effect on their protein metabolism.

Keywords: *albumin, creatinine, total protein, urea, uric acid, ZooBioR product, quails.*

THE INFLUENCE OF ENVIRONMENTAL FACTORS ON SEMINAL MATERIAL EPIGENETICS

**Balan Ion¹, Balacci Sergiu², Roșca Nicolae², Buzan Vladimir², Furdui Vlada²,
Osipciuc Galina³, Mereuță Ion², Crețu Roman², Bacu Gheorghii²,
Turcanu Parascovia²**

¹Technical University of Moldova, Chisinau, Republic of Moldova

²State University of Moldova, Chisinau, Republic of Moldova

*³Public Institution Scientific-Practical Institute of Biotechnologies in
Animal Husbandry and Veterinary Medicine, Maximovca, Anenii Noi,
Republic of Moldova*

E-mail: balanion@rambler.ru

Parental effects can influence offspring through mechanisms dependent and independent of genetic factors, including sperm. Sperm factors contribute to the modulation of offspring development through epigenetic modification of gametes under the influence of the environment. Epigenetic changes in gametes, determined by the environment at the molecular level, explain the transmission of hereditary developmental potential across generations. The evolutionary implication of epigenetic variation as a source of genetic variation is very appealing because it reconciles two theoretical models of species evolution that often present themselves in opposing ways. First, evolution by epigenetic inheritance of the genome directly modified by environmental stressors, and second, evolution by continuous genetic variation within a population and selection at the extremes of the phenotype. The influence of environmental factors on the epigenetics of the semen is controlled by the genetic information, but also dictated by the epigenetic information contained in the spermatozoa. At the same time, more experimental scientific evidence is needed, which addresses, at the level of reproductive cells, the structural and functional mutagenicity of regions subject to epigenetic variations, induced by environmental factors and evolutionary implications. Environmental factors influence the phenotype of subsequent generations through epigenetic inheritance, that is, the gametic transmission of epigenetic information, determined by the environment, to offspring. Epigenetic remodeling of reproductive cells at the structural and functional level (DNA, chromatin, RNA) in the process of spermatogenesis influences the phenotype of the next generation through dynamic reactivity to environmental stressors. At the same time, the functional consequence on embryogenesis and the phenotype of the next generation remains largely unknown, even though there is genuine evidence of environmentally influenced sperm epigenetic factors capable of modifying the phenotype of the next generation.

Thus, the elucidation of the role of epigenetic changes, determined by environmental factors in gametes on the offspring phenotype, is not only a fascinating biological question, but also a moral obligation of research for the health of future generations.

Key words: chromatin, DNA, environmental factors, epigenetics, RNA, seminal material.

DISTRIBUTION OF INNERVATION SOURCES IN THE GENITAL ORGANS IN RABBITS DURING THE PERIOD OF 2.0-4.0 MONTHS

Didoruc Sergiu, Dumitriu Antonina

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: sergiu.didoruc@sasp.utm.md

The scientific analysis presented in this study aimed to determine the structural elements of the nervous system, which are the basis of the innervation of the genital organs in rabbits in the stages of postnatal development. As a result of these researches, the sources and basic plexuses were examined, which are distributed in all the organs of the reproductive system in rabbits through the connecting branches.

However, conducting the study through fine anatomical dissection, it was determined that the sympathetic system, which provides the innervation of the reproductive organs, originates from the lumbar segment of the spinal cord. From this segment come the nerve branches that participate in the formation of the prevertebral ganglia in the lumbosacral complex. These in turn participate in the formation of the caudal mesenteric plexus which, in addition to the lumbar branches of the paravertebral ganglia, consists of a small, odd star-shaped mesenteric ganglion and 3-4 branches of the caudal mesenteric nerve.

Examining the development process of the caudal mesenteric plexus in different periods of postnatal development, it was found that gl. caudal mesentery shows essential development and demonstrates an absolute increase, towards the 4th month, in length of about 45.4% and width of 29.7%. The caudal mesenteric plexus which has an absolute increase in linear parameters, towards the 4th month of post-embryonic development, of about 26.0% at the level of the caudal pole emits the hypogastric trunk which contributes to the formation of the lumbar plexus and as a result to the innervation of the complex of positioned organs in the pelvic cavity.

At the base of the hypogastric trunk, close to the point of origin of the ovarian arteries, the ovarian ganglion is formed, from which to the aa. ovarian, the homonymous nerve branches are emitted. These rr. nerves at the level of the abdominal aorta form ovarian plexuses that are placed at the origin close to aa. right and left ovaries. In the process of postnatal development of the reproductive organs in rabbits, it was found that the ovarian plexus undergoes certain changes, which at the age of 2 months presents 3.18 ± 0.07 mm in length and 0.83 ± 0.04 mm in width and corresponding to the 4th month of growth, the length is 5.83 ± 0.07 mm and the width 1.18 ± 0.02 mm. These changes demonstrated a growth enhancement of 45.4% in length and 29.6% in width towards the 4th month of postnatal development of the animal body.

In conclusion, we can mention that the changes in the linear parameters of the main innervation segments of the reproductive system in rabbits confirm that towards the 4th month of development the nervous system acquires the necessary structures, which will ensure the efficient innervation of all segments of the reproductive system in rabbits.

Keywords: ganglion, hypogastric trunk, nerve plexus, rabbits.

**THE INFLUENCE OF THE ZOOBIOR REMEDY ON SOME
PARAMETERS OF ENDOTOXICOSIS AND HISTIDINE
DIPEPTIDES IN THE SERUM QUAIL BLOOD**

Rotaru Ana

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: ana.rotaru@sfc.utm.md

The aim of the study was to investigate the effect of the active biological product ZooBioR, obtained by modern technologies from the cyanobacterium *Spirulina platensis*, on health and especially on the endotoxycosis marker indices and histidine dipeptides in the blood serum of laying quails treated with the ZooBioR remedy. The research was carried out on 4 groups of 50 quails each. Birds from three experimental groups were fed the tested product in different doses (10.0-15.0-20.0 mg of active substance/kg of concentrated feed, and birds from the control group - the ration was without supplement. The quails from all groups benefited from the same conditions, were monitored daily, and for the laboratory examination, random blood was collected from 5 birds at the beginning of the study, and later twice from 5 birds from each group.

The researches carried out showed that the tested product was well tolerated by the birds, also showing changes in some investigated biochemical parameters. Thus, the average mass molecule content in the blood of the quails at the beginning of the study was on average 49.7 u/c, an index that decreased by about 38% at the end of the experiment. In addition, the ZooBioR product induced a clear tendency to decrease these molecules: at the first research stage by 1.6-1.9 times and respectively at the last experimental stage – by 1.1-1.2 times. Another marker of endotoxycosis is the biochemical parameter – necrotic substances whose values at the beginning of the study averaged 7.2 u/c (at this stage the highest level of the investigated parameter was reported). Next, it was established that the remedy tested at the first experimental stage significantly decreased the investigated parameter by 1.4-1.7 times, and at the last experimental stage this decrease is less obvious. It was shown that the dynamics of necrotic substances were identical to substances of average molecular weight in birds from all groups and at all stages of the research. In parallel, and on the contrary, the feeding of the ZooBioR remedy induces an increase in histidine dipeptides in the first stage by – by 15.8–17.4% and an increase of 2.0–8.1%, respectively, compared to the quails in the control groups. In conclusion, the tested product contributes essentially to the decrease of endotoxycosis marker indices and to the increase of histidine dipeptides in the blood serum.

Key words: histidine dipeptides, medium mass molecules, ZooBioR remedy, quails.

SESSION V - AGRICULTURAL ENGINEERING

CZU: 662.8

EFFECTS OF DENSIFICATION PARAMETERS ON THE QUALITY OF BRIQUETTES PRODUCED FROM MIXING *MISCANTHUS GIGANTEUS* AND AGRICULTURAL RESIDUES

Marian Grigore, Daraduda Nicolae, Gudîma Andrei

Technical University of Moldova, Scientific Laboratory of Solid Biofuels,
Chisinau, Republic of Moldova

E-mail: nicolae.daraduda@tran.utm.md

The aim of this study was to investigate the influence of densification parameters on the compaction degree of briquettes obtained from biomass derived from mixtures of *Miscanthus giganteus* and arboricultural residues. The study focuses on establishing the relationships between the influence of process variables (matrix temperature, compaction pressure and biomass moisture) on briquette particle density.

The experiments were carried out in the UTM Scientific Laboratory of Solid Biofuels, using a laboratory equipment developed by the authors of this study, which allows the compaction of single briquettes in closed cavity and in flow by monitoring the compaction regimes. The study was conducted using a 2k complex central factorial experiment, to which 2k "star" points were added at a distance $\alpha=5\%$, along with 2 experiments conducted at the central point.

Statistical processing of the experimental data, obtained in this study, resulted in the following regression equation which, in natural coordinates, shows the relationship between particle density and densification regimes of briquette samples produced from a mixture of *Miscanthus* (50%) + Arboricultural Residues (50%):

$$DE = 0,146+0,003T+0,004P+0,05M-0,000004T^2-0,000002T \times P-0,00008T \times M+0,000002P^2-0,0002P \times M-0,0004M^2.$$

Analysing the obtained equation, it can be deduced that pressure (P) and compression temperature (T) have a dominant effect on particle density, while moisture content (M), within the limits of the experiment, does not record significant modification. By calculating the prime equation, it is possible to determine the values of the technological regimes that provide the most favourable conditions for obtaining the quality parameters predetermined by the manufacturers.

As a result of the analysis of the data obtained in this research, it was possible to establish an interdependence between the values of process variables and the densification capacity of briquette particles produced from lignocellulosic biomass, on the example of mixtures of *Miscanthus giganteus* and arboricultural residues, which can serve as a reliable tool for choosing the technological regimes for briquette densification.

Acknowledgements: This study was possible due to funding provided by the projects 20.80009.5107.02 no. 42.2-PS and 20.80009.5107.13 no. 52 PS within the State Programme of the Republic of Moldova.

Keywords: arboricultural residues, biomass mixtures, briquettes, densification regimes, particle density, *miscanthus giganteus*.

VEGETABLE GROWING IN THE REPUBLIC OF MOLDOVA: STUDY OF MECHANIZED PLANTING SEEDLINGS

Melnic Iurie, Melnic Angela, Badiul Vladimir

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: iurie.melnic@im.utm.md

Vegetable growing is one of the main agricultural sectors in the Republic of Moldova. However, for various reasons, today vegetable production is going through hard times, since the sales market for products has shrunk significantly, which has led to a reduction in the production area of major vegetable crops, such as tomatoes, peppers, cabbage and others.

The high level of imports of vegetables and vegetable products into the country pushes farmers away from the production of domestic vegetables. Today, vegetable growers initially find themselves in unequal competitive production conditions with their foreign colleagues, since these problems are aggravated by problems in the technology of growing vegetable crops, which do not allow for the full mechanization of technological processes. Planting seedlings is one of the most labor-intensive and important technological operations when growing vegetables. A lack of workers in agricultural production is felt more and more strongly, and the mechanization of work when planting seedlings plays an increasingly important role.

Transplanting machines do not fully comply with the agritechnical requirements for the process of planting seedlings. The working parts of imported planting machines do not always correspond to the physical and mechanical properties of the soil on which it is planned to grow vegetables. The result is a lot of wear on the working parts of the planting machines or failures associated with the machine breaking down in the field while performing work.

Preliminary field experiments on planting cabbage seedlings conducted in the early summer of 2023 at the „Polyus-Agro” farm in the village of Kremenchug revealed some design shortcomings of the carousel-type transplanting machine from the Italian company Checchi & Magli, such as: unevenness planting of seedlings; covering plants with soil; clogging of the press wheels and coulter with soil and plant remains.

During the experiments, simultaneously with planting, the performance of the equipment for installing a drip irrigation system additional installed on the transplanting machine was also tested.

Experiments have shown that this design can be improved by design and technological parameter optimization, which will eliminate the listed disadvantages and improve the quality of planting seedlings.

Keywords: drip irrigation, parameters optimization, transplanting seedlings, technological processes, transplanting machine, vegetables.

CHARACTERIZATION AND EVALUATION OF ENERGY PROPERTIES OF BRIQUETTES PRODUCED FROM MISCANTHUS, SEA BUCKTHORN AND ARBORICULTURA RESIDUES AND THEIR MIXTURES

Daraduda Nicolae, Marian Grigore, Pavlenco Andrei

*Technical University of Moldova, Scientific Laboratory of Solid Biofuels,
Chisinau, Republic of Moldova*

E-mail: grigore.marian@if.utm.md

The aim of the study presented in this paper was to improve the quality of briquettes by using as raw material various mixtures of miscanthus plant biomass, sea buckthorn, arboricultural residues in various proportions of components. The quality of briquettes was estimated by the calorific value, ash content and particle density. The quality degree was assessed by comparison with the stipulated norms for A1, A2 and B categories of the SM EN ISO 17225-3:2017 standard.

The experimental investigations were carried out in the UTM Scientific Laboratory of Solid Biofuels and the properties were estimated according to the standard methods validated in this laboratory.

The experimental data obtained showed that all the samples produced from the raw material used in this study have a calorific value higher than 15.5 MJ/kg, i.e., exceeds the minimum value required by for the A1 ENplus category. Other parameters vary from case to case. For example, the briquettes made of Miscanthus x Giganteus 25% + Sea Buckthorn 25% have an ash content of less than 1%, being classified in A1 category according to this parameter, and the particle density is close to the requirements for A1 category.

Increasing the content of sea buckthorn in the mixture, the briquettes record a lower particle density, while the ash content also increases. It should be noted that, regardless of the percentage of sea buckthorn content, the briquettes produced from these mixtures are classified in the A2 category of quality.

It has been determined that for the production of B category of briquettes, it is not necessary to use mixtures, as the quality parameters are ensured even when only Miscanthus x Giganteus biomass is used. Based on the similitude method, it can be deduced that the briquettes produced from mixtures containing about 30% Miscanthus x Giganteus, the rest - sea buckthorn residues, certainly meet the requirements set out by the standard SM EN ISO 17225-3:2017 for A1 category.

When using mixtures of arboricultural residues, regardless of the proportion, the obtained briquettes are classified in the B category because the ash content exceeds the 1.5% required for A2 category.

Acknowledgements: This study was possible due to funding provided by the projects 20.80009.5107.02 no. 42.2-PS and 20.80009.5107.13 no. 52 PS within the State Programme of the Republic of Moldova.

Keywords: *arboricultural residues, biomass mixtures, briquettes, particle density, miscanthus giganteus, Sea Buckthorn.*

**THE VARIABLE-VOLUME PRESSING CHAMBER FOR
FORMING SMALL-SIZED FUEL ROLLS FROM THE BIOMASS
OF THE AGRICULTURAL PLANT STEMS**

**Yaheliuk Svitlana, Didukh Volodymyr, Yaheliuk Oleksander,
Fomich Mykhailo**

Lutsk National Technical University, Lutsk, Ukraine

E-mail: cler2010@gmail.com

After a combine harvesting biomass of stems of agricultural plants, such as wheat, rye, flax, corn, etc. is formed in the field. According to modern data, the amount of burned stems biomass is about 400 million tons annually in the world. It has been established that during the burning of plant biomass, solid particles (soot), nitrogen oxide, various carcinogens and carbon monoxide are emitted, which pollute the surface layer of ozone. This, in turn, leads to negative climate changes. Problem of utilization of stem residues is considered in the publications of Ukrainian and foreign scientists. Many researchers propose ways to solve the problem of utilization. The most appropriate simple and economically justified way of using the biomass (residues) of agricultural plant stems is the production of Small-sized Fuel Rolls (SFR) for modern heating solid fuel boilers. The determining quality indicators for SFR are the twisting density of biomass and the geometric dimensions of the roll. It is advisable to use a specially designed Variable-Volume Pressing Chamber for the production of fuel SFRs. In this case, the twisting density of the biomass and the geometric dimensions of the SFR depend on the pressure created by the rollers in chamber and the volume of a linear meter of the biomass tape that is fed into the Variable-volume Pressing Chamber.

The article presents the results of an experimental study of the operation of a Variable-volume Pressing Chamber for forming Small-sized Fuel Rolls (SFR). As a result of the conducted research, rational technological parameters of the Variable-volume Pressing Chamber were established, which allow the formation of high-quality SFR. The effect of the pressure created by the rollers in the pressing chamber and the volume of a running meter of the biomass of the agricultural plant stem fed into the pressing chamber on the density of the obtained MPRs was investigated. The obtained results show that the rational density for SFR is 100-130 kg/m³.

Based on the generalization of the conducted research, it can be stated that at the current stage of the development of agro-industrial production, the most rational way of processing the stem biomass of the agricultural plants is the production of SFR in the Variable-volume Pressing Chamber.

Keywords: biomass, density, small-sized fuel rolls (SFR), stems, variable-volume Chamber.

QUALITY ASSESSMENT OF BIOMASS MIXTURES FROM SEA BUCKTHORN AND FRUIT TREES RESIDUES

Nazar Boris, Marian Grigore, Malai Leonid, Daraduda Nicolae

*Technical University of Moldova, Scientific Laboratory of Solid Biofuels,
Chisinau, Republic of Moldova*

E-mail: nicolae.daraduda@tran.utm.md

Climate change issues and the depletion of fossil fuels have led to an increased interest in renewable and sustainable energy sources. In this context, solid biofuels have become a promising option, while sea buckthorn has emerged as a valuable raw material used in the production of densified solid biofuels (DSBF) meeting the international ENPlus standards.

The aim of this research was to evaluate the quality of biomass mixtures produced using arboricultural residues and those resulting from the sea buckthorn production chain. The research was carried out within the UTM Scientific Laboratory of Solid Biofuels using standard methods of analysis of solid biofuels.

In this study the biomass of sea buckthorn and agricultural residues was collected from different farms located in the Republic of Moldova. Qualitative analysis of the mixtures was carried out in the UTM Scientific Laboratory of Solid Biofuels.

The results are summarised in the table below:

No.	Biomass Type	Q_r , MJ/kg	A, %	V_d , %
1	SB 0%+100% AR	17,28	3,09	80,98
2	SB 25%+75% AR	17,31	2,87	79,36
3	SB 50%+50% AR	18,05	2,56	78,02
4	SB 75%+25% AR	18,31	2,05	77,12
5	SB 100%+0% AR	18,31	0,98	79,16

Note: SB - sea buckthorn; AR - arboricultural residues; Q_r - net calorific value at 10% sample moisture; A - ash content; M - moisture content; V_d - volatile content.

The results obtained in this experiment show that the use of arboricultural residues mixed with sea buckthorn residues for the production of pellets and briquettes can be quite effective as it can increase the calorific value and decrease the ash content of the final product. It is sufficient to add 25% of sea buckthorn biomass to the biomass resulting from arboricultural residues for the quality of the solid biofuels produced from this mixture to reach ENplus 3 standards. Thus, it can be concluded that sea buckthorn residues represent an important source of raw material in the formation of mixtures with the prospect of being used for the production of ENplus 3 certified pellets.

Acknowledgements: This study was possible due to the funding provided by the project 20.80009.5107.13 no. 52 PS within the State Programme of the Republic of Moldova.

Keywords: *arboricultural residues, Ash content, briquettes, calorific value, mixtures, Sea Buckthorn.*

SOME CONCEPTUAL AND THEORETICAL APPROACHES TO THE EXPLOITATION OF DRONES IN AGRICULTURE

Osoianu Alexandru

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: alexandru.osoianu@doctorat.utm.md

Unmanned aerial vehicles represent a key technology for farmers, as it minimizes costs and increases productivity through usage reduction of fertilizers, insecticides, herbicides, fungicides and other pesticides, therefore rising the general security of crops and yield. The major advantages of drones will make possible for UAV to spread in the agricultural community in the following years. Via this article, we clarify some aspects regarding to regulation of agricultural drone utilization and exploitation, highlighting, especially, the advantages of this technology implementation, but also its actual state in the Republic of Moldova.

In order to conduct the study, the following research methods will be employed: the Observation Method, the Survey Method, the Comparative Method and the Monographic Method.

An agricultural drone is an unmanned aerial vehicle (UAV) employed in agricultural operations, primarily for optimizing crop yields and monitoring crop growth and production. Agricultural drones provide information about crop growth stages, crop health, and soil variations. Multi-spectral sensors are used on agricultural drones to visualize electromagnetic radiation beyond the visible spectrum, including near-infrared and shortwave infrared.

Currently, only two main operators specializing in agricultural drone services operate in the Republic of Moldova. Their area of operation covers the entire country, with operators transporting their equipment to requesting farms by road. Lately, agricultural drone services have been in high demand during the peak months from April to July. Requests are scheduled at the beginning of the new calendar year, and the service providers' schedules are filled well in advance of the start of the season's work. These services are particularly sought-after during periods of herbicide application, even though they prioritize fields with a minimum working area of 50 hectares. The cost of treating one hectare varies between 250 to 300 Moldovan Lei. The convenience of these services also lies in the precise calculation of the quantity of solutions required for spraying an area of 50 hectares, treated water with the appropriate pH according to the chemical compounds used, fungicides, herbicides, etc., or 5-10 hectares of orchards. Approximately 70% of the services provided are for areas planted with cereal crops.

Keywords: agriculture, agricultural robot, drone, software, UAV.

CZU: 631.173(478)

IMPROVING THE MAINTENANCE STRATEGY OF THE AGRICULTURAL MACHINERY IN THE CONDITIONS OF THE REPUBLIC OF MOLDOVA

Marian Teodor

Agrotehservice Enterprise, SRL Basadoro Agroteh

E-mail: marian@basadoro.md

This paper presents the analysis of the situation and proposes solutions regarding the maintenance of agricultural machinery in accordance with the existing conditions of technical and economic development of agriculture in the Republic of Moldova.

The purpose of this paper was to present an overview of the situation in the field of agricultural machinery maintenance, with the aim of evaluating the maintenance practices of agricultural machinery currently existing in the Republic of Moldova and highlighting possible directions for improving maintenance strategies for the future.

This purpose was achieved by carrying out a systemic analysis of the specialized literature and the existing experience regarding the maintenance strategies of agricultural machinery and the quality management methods used in the maintenance of agricultural machinery. Based on this analysis, the research hypothesis was formulated, which assumes the possibility to improve the maintenance system of agricultural machinery by using advanced quality management methods in this field.

The research was focused on a case study with a detailed examination of the situation in the technical services enterprise SRL AGRISolutions making the SWOT analysis of the existing situation. Based on this analysis, several solutions were formulated to improve the situation related to quality management of the maintenance activities carried out at this enterprise.

Acknowledgements: This study was possible due to funding provided by the projects 20.80009.5107.02 no. 42.2-PS and 20.80009.5107.13 no. 52 PS within the State Programme of the Republic of Moldova.

Keywords: *agricultural machinery, expertise method, maintenance, SWOT analysis.*

FUELS FOR MODERN AGRICULTURAL MACHINERY

Tkachuk Valentyna

Luts'k National Technical University, Ukraine

E-mail: v.tkachuk@lntu.edu.ua

Environmental and sustainability experts agree: The world needs to take quick action on climate change and accelerate our transition to clean energy. And with rising costs and fuel shortages, in part driven by the war in Ukraine, the urgency around securing a reliable, affordable energy source is of the utmost importance to all planet now.

In my view, now is using bio additives for fuels, also in agricultural machinery. So, there are results of several experiments with adding biocomponents into diesel fuel. Additionally, the effectiveness of the additive for cleaning was tested. At the same time, contaminated injectors are installed in the engine after running on basic diesel fuel and determining the flow limit without cleaning the resulting carbon deposits. Then the engine was run on a standard cycle already on the tested fuel with a Keropur DP ENERGY additive package in a dosage of 150 mg/kg. In this case, the flow limit is reduced from 79.4 % (basic diesel fuel) to 68.2%, i.e. more than half of the resulting deposits are removed in just one run within 10 hours. This result of this test is considered acceptable for European fuels.

The use of multifunctional additive packages for diesel fuel allows you to maintain the cleanliness of the engine fuel injection system at the required technical level. Consequently, the optimal composition of the fuel-air mixture is ensured and the most complete and efficient combustion is guaranteed.

Keywords: additives, corrosion, diesel fuel, standard.

THEORETICAL MOTIVATION OF BIOFUEL COMPOSITION FOR COMPRESSION IGNITION ENGINES

Cerempei Valerian, Banari Eduard

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: eduard.banari@tran.utm.md

The purpose of this paper is to improve the situation in the ecological field and to improve the technical-economic performance of compression ignition engines (CI engines) by theoretically motivating the composition of the biodiesel-diesel mixed biofuel for fueling these engines. Therefore, diesel (control) and experimental biofuels served as *the object of the research* - pure biodiesel B100, biodiesel-diesel mixtures B20, B40, B50, B60, B75 with respectively biodiesel content of 20, 40, 50, 60, 75% vol.

Exothermic oxidation chemical reactions between fuel and oxidizer serve as the primary source of energy in internal combustion engines, including CI engines. The main indices of the stoichiometric reactions were: the theoretically necessary amount of air L_0 , kmol, for burning 1 kg of fuel; the amount of combustion mixture M_l , kmol/kg comb., m_l , kg/kg fuel; lower calorific value NCV of the fuel, MJ/kg, and of the combustion mixture MJ/kmol mixt., MJ/kg mixt.; molar variation, ΔM , kmol/kg, of combustion products.

For a more extensive and objective motivation of the composition of the mixed biofuel, we, for the first time, proposed and calculated the values of the coefficients of change in the amount of the combustion mixture $K = M_1^B / M_1^m$ (kmol/kg fuel) and $K_c = NCV^m / NCV^B \cdot K$ (kmol/cycle), as well as of the conventional excess air coefficient $\alpha_{conv} = L^B / L_0^B = L_0^m / (K^B \cdot L_0^B)$.

The results of the calculations demonstrate that the K_c coefficient values vary within narrow limits: from the maximum value of 1,00199 with B20 to the minimum value of 0,98347 with B100 (in the case of diesel combustion $K_c = 1,0$).

The calculated values of the conventional coefficient of excess air in the case of fueling with diesel and biodiesel-diesel mixtures vary within the narrow limit $\alpha_{conv} = 1,0 - 0,99$, which demonstrates the possibility of supplying CI engines with biodiesel-diesel mixtures without introducing changes in construction and in fuel and air system adjustments.

The results of the theoretical reasoning indicate that pure B100 biodiesel and biodiesel-diesel blends ensure good operation of the compression ignition engine without changing the geometrical parameters of the combustion chamber and the CI engines fuel and air supply system. However, taking into consideration the economic and energetic performances, it would be more efficient to use small biofuels with the volumetric fraction of biodiesel of 20%-40% (B20-B40).

Keywords: *biodiesel, calorific value, coefficient, combustion, Diesel engine, excess air, mixture, parameters.*

ARGUMENTATION OF BIOFUEL COMPOSITION FOR COMPRESSION IGNITION ENGINES THROUGH TRIBOLOGICAL STUDIES

Cerempei Valerian¹, Banari Eduard¹, Croitoru Dumitru², Țiței Victor³

¹Technical University of Moldova, Chisinau, Republic of Moldova

²Institutul de Fizică Aplicată, USM, Chisinau, Republic of Moldova

³„Al. Ciobotaru” National Botanical Garden (Institute), SUM,

Chisinau, Republic of Moldova

E-mail: eduard.banari@tran.utm.md

The purpose of this paper is to experimentally argue the composition of the biodiesel-diesel mixed biofuel for fueling compression ignition engines based on tribological research. That is why diesel (control) and experimental biofuels - pure biodiesel B100 and the mixture B20 (20% vol. biodiesel-80% vol. diesel) served as the object of the experimental research.

The tribological researches were carried out in the specialized laboratory of the Technical University of Moldova on the MVPD-1KPI installation, which allowed the modeling of the real operating conditions of the cylinder liner-piston segment coupling by performing alternating rectilinear movements.

The results of our research confirm that the average values of the coefficient of friction f , in the case of using biofuels B20, B100 as the lubricating material, are higher in relation to diesel ($f=0,03584$): by 15,6% ($f=0,04244$) for B20 and by 23,3% ($f=0,04675$) for B100, respectively.

The dynamics of wear U of the elements of the tribological coupling demonstrates that the value of the wear of the body - the chrome surface, in the diesel environment was 0,6 mg, in the biofuel mixture B20 the wear increased by 0,1 mg in relation to the value of the wear in the diesel environment (i.e. by 14,3%). Increasing the concentration of biodiesel up to 100% (biofuel B100) has as a consequence the decrease of U wear by 14,3% ($\Delta U= 0,1$ mg) compared to B20 and equal to the wear value in the diesel environment.

Another is the situation with the wear dynamics of the GCI (gray cast iron) counterbody. The obtained results demonstrate that, in the case of using biofuels B20 and B100 for surface lubrication, the U wear value of the GCI counterbody decreased by 48,4% and 45,2%, respectively, in relation to the wear value of the diesel lubricated counterbody

Therefore, the results of tribological research indicate that pure B100 biodiesel and biodiesel-diesel blends can ensure the reliable and durable operation of one of the most important joints of the compression ignition engine: the cylinder liner-piston ring. The results of bench research and tests in the exploitation conditions of DC4 11,0/12,5 compression ignition engines (compression ratio $\epsilon=16$), fed with B20 biofuel, confirmed the veracity of the results obtained in the tribological research.

Keywords: *biodiesel, coefficient, Diesel engine, friction, mixture, tribological coupling, wear.*

SESSION VI - FOOD TECHNOLOGY

CZU: 664:621.798.6

FRONT LABELING AS A STRATEGY TO ENSURE SUSTAINABLE AGRI-FOOD SYSTEMS

Siminiuc Rodica, Turcanu Dinu

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: rodica.siminiuc@adm.utm.md

One of the essential directions for ensuring food security is the development of sustainable nutrition, which involves satisfying the nutritional needs of each individual but with care for the environment.

This involves the adoption of new models that encourage agri-food systems to pay more attention to the nutritional quality of food so that it is safe, accessible to all, sustainable and inclusive, as well as enforceable, objective and transparent, and could reduce a number of the competing objectives of food security. Front-end nutrition labelling (FNL) and eco-efficiency (EE) systems have been proposed to address health disparities and sustainable food and nutrition security.

The aim of the study is the exploratory analysis of existing front-end nutrition labelling and eco-efficiency systems to make informed decisions about the further development of an effective front-end labelling system. The systematic document review and data triangulation method was applied to carry out the study.

Transitioning to sustainable and healthy diets is essential to meeting the Sustainable Development Goals. Although front-end nutrition labelling and eco-efficiency indicators add evidence of their feasibility and effectiveness as an essential measure to change dietary behavior to improve the planet's health, experiences provide various reasons to be cautious about increasing sustainability labelling.

Instead, it can target small incremental changes at different levels and actors in the food system, both at individual and organizational levels.

Research on nutrition labelling and front-end eco-efficiency systems is required to provide opportunities for the development of food system analyses and sustainability metrics.

As a result, food system actors will be better equipped to communicate the nuances, assess the risks and trade-offs of system-wide interventions, and ultimately contribute to the evolution of sustainable and healthy food systems.

Acknowledgments: This study was supported by the research project: Exploratory analysis of food security in the Republic of Moldova based on metrics of nutritional and sustainable quality (CNuD) of food products and Project No. 20.80009.5107.10: PS Personalized nutrition and intelligent technologies for my well-being, which runs within the Technical University of Moldova, funded by (Supported by the National Agency for Research and Development (NARD), Republic of Moldova.

Keywords: *ecological efficiency indicators, food and nutritional security, food choices, nutritional quality, public health.*

CONSUMER BEHAVIOR AND CURRENT TRENDS IN SUGAR CONSUMPTION IN THE REPUBLIC OF MOLDOVA

Boistean Alina, Chirsanova Aurica, Sturza Rodica, Siminiuc Rodica

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: alina.boistean@toap.utm.md

Global sugar consumption exceeds WHO recommendations. Sugar consumption is increasing, especially in low- and middle-income countries. In the context of the above, the objective of this research was to analyze the attitude and perception of the population of the Republic of Moldova regarding the consumption of sugar and its content in food products.

To achieve the objectives of the research, a sociological survey was conducted based on a questionnaire in which 260 people from the RM participated. Participation in this survey was voluntary. The data were collected during the period of 2022, in the months of October-November, and the completion of the questionnaires took place online.

According to the data obtained, only 25.80% of the respondents rarely consume foods high in sugar and only 1.20 have completely excluded them from their diet. A good proportion consume Often (31.90%) or even Always (7.70%). Based on the statistical analysis, it can be seen that more than half of the respondents, namely 55.40%, do not consume sugar when drinking hot drinks, and only 1.90% consume 3 or more teaspoons of sugar. This aspect indicates that people are aware of the negative impact of sugar on the body and are trying to reduce its consumption in certain ways. When asked if they take concrete actions to reduce sugar consumption, a positive result. 52.70% are those who daily take into consideration their actions and try to adapt their eating habits towards a healthy lifestyle. One negative aspect that only 32.7% of respondents are interested in reducing sugar consumption and are ready to take some concrete steps in this direction. The rest of the people even if they are aware of the negative effects it has on the body, do not take the initiative to have a balanced sugar consumption.

Ultimately, reducing the consumption of sugar-enriched foods and beverages is a complex challenge that requires an integrated and collaborative approach. It is important that governments, the food industry and consumers work together to promote healthy food and active lifestyles so that we can improve our health and well-being.

Acknowledgments: This work was partially supported by the state projects 20.80009.5107.09 „Improving of food quality and safety through biotechnology and food engineering” and 20.80009.5107.10. „Personalized nutrition and intelligent technologies for my wellbeing”, running at Technical University of Moldova.

Keywords: *behavior, consumer, non-communicable diseases, nutrition, sugar consumption.*

CARAWAY SEEDS (*CARUM CARVI*) – SOURCE OF BIOLOGICAL ACTIVE COMPOUNDS

Botezatu Andreea¹, Bălănescu Fanica^{2,1}, Busuioc Anna², Bratu Botea C.³, Iancu Alina Viorica², Furdul Bianca¹, Dinică Rodica Mihaela¹

¹„Dunărea de Jos” University, Galati, Faculty of Sciences and Environment, Romania

²„Dunărea de Jos” University, Galati, Faculty of Medicine and Pharmacy, Romania

³Plant Genetic Resources Bank for Vegetables, Floriculture, Aromatic and Medicinal Plants, Buzau, Romania

E-mail: bfurdul@ugal.ro

Since ancient times, plants have been used by humans in food or traditional medicine to treat various ailments. Caraway (*Carum carvi*) is a plant of the Apiaceae family, native to western Asia, currently cultivated mainly in Poland, Hungary and Morocco, which prefers dry and loamy soils, needing a lot of sun. It is recommended in states of bloating, stomach ulcers, diarrhea, abdominal cramps, food poisoning.

In the present work, different methods for extraction of volatile compounds from seeds of *Carum carvi* species, presence of monoterpene compounds in obtained extracts, as well as the antimicrobial properties of volatile oil obtained from the studied plant material were investigated. The vegetal extracts were obtained by hydrodistillation, followed by solvent extraction of hydrodistillate, ether extraction of volatile compounds or by extraction of volatile oil using the NeoClevenger plant.

TLC, UV-Vis and FT-IR spectroscopy, and polarimetry revealed the presence of S (+)-carvone and (+) limonene, respectively, in caraway seeds. Determination of optical activity for chloroform caraway seed extract shows that the solution has a positive rotation angle of +38.2 °C, confirming the presence in cuminal carvone and limonene dextrogyr enantiomers. Evaluation of the antimicrobial activity of volatile caraway oil revealed its antibacterial properties against *E. coli* and *S. aureus* strains.

Findings from the present study confirm the benefits of using this plant product both in food and for therapeutic purposes.

Acknowledgments: This study was supported by the research project ADER grant 5.2.1. – Conservation and valorization of the genetic heritage of aromatic and medicinal species suitable to be cultivated on the territory of Romania, funded by Romanian MADR.

Keywords: antimicrobial activity, caraway seeds, monoterpenoids.

THE INFLUENCE OF AGRONOMIC GROWTH TECHNIQUES ON THE CALCIUM POTENTIAL IN POULTRY PRODUCTS

Mija Nina, Paladi Daniela

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: nina.mija@toap.utm.md

One of the persistent trends in the poultry industry is the massive use of intensive bird rearing techniques - in batteries, in closed spaces. The determined aim of this investigation was to make a comparison between the amount of Ca accumulated in poultry products, coming from poultry farm with industrial rearing conditions and birds raised under organic farm conditions.

The food product sample with a mass of about 5 g was subjected to calcination, then mineralization. To 2.5 ml of mineralized ash were added 3 ml of ammonium oxalate solution, 0.2 N, and 0.5 ml of ammonia solution, 25%. Upon subsequent heating for 10 min. calcium oxalate sediment is formed. The sediment is separated with the help of a Bunsen flask, then dissolved with H₂SO₄ conc., approx. 2 ml. The obtained extract is brought to 20 ml with distilled water. To each extract sample, which contains Ca ions and oxalate ions in a soluble state, was added 5 ml of KMnO₄, 0.02 N, an amount that in the given case is in excess. Residual Ca was titrated with sodium thiosulfate, Na₂S₂O₃, 0.02 N. Next step was the calculation according to the equilibrium reactions.

The conditions of raising chickens drastically influence the amount of calcium accumulated in the resulting products. A particularly large difference was observed for chicken liver, the one obtained from the organic farm exceeded 1.7 times the amount of accumulated calcium compared to the similar product from the industrial farm. The amount of calcium accumulated in hen legs is 42 mg% for industrial conditions and 56 mg% for ecological conditions, in hen liver, respectively 28 and 47 mg%. In the case of chicken legs, the difference in calcium content is reflected in the difference in tenderness. The egg yolk did not show much difference in calcium when comparing the growth regime.

Poultry products do not contain significant amounts of calcium, but even the smallest variations of this element can influence the nutritional value and technological qualities.

In general, the rearing regime of birds, under industrial or ecological conditions, differently influences the accumulation of calcium in the resulting poultry products.

Keywords: calcium content, ecological rearing techniques, industrial rearing techniques, nutritional value, poultry products, technological qualities.

INTELLIGENT OPPORTUNITIES TO USE BETA GLUCANS FOR YOUR WELL-BEING

Chioru Ana, Chirsanova Aurica

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: aurica.chirsanova@toap.utm.md

β -glucans are polymers of glucose with different glycosidic linkages. Most β -glucans play a crucial role in cell wall structure, while others are used as an energy source for metabolism. Despite their simple monosaccharide composition, glucans show a different structural variability. β -glucans are recognized as biologically active substances with immunomodulatory, antioxidant, anti-inflammatory, antitumor properties, normalize cholesterol and glucose.

According to the document published by EFSA (European Food Safety Authority) in 2011, „Scientific opinion on the safety of 'beta-glucans from yeast' as a novel food ingredient”, β -glucans have been recognized as safe products that can be used both in soluble form as well as in insoluble form. For dietary supplements or foods intended for special nutritional uses, a daily dose of 375 mg to 600 mg is recommended. Following this opinion, the European Union adopted Decision (EU) 2017/2048 in 2017, which extended the use of beta-glucans from the yeast *S. cerevisiae* to other foods, such as juices (1.3 g/kg), breakfast cereals (15.3g/kg), biscuits (6.7 g/kg), powdered milk (25.5 g/kg) and dairy products (3.8 g/kg). This European Union decision was revised in 2019 and added the required purity of β -glucans, which must be greater than 80%. Similarly, more products have been added where the use of beta-glucans is allowed, such as: fermented dairy products, soups, cereal bars, chocolate and sweets, marmalade, jam, and other fruit spreads. At the same time, it should be noted that the structure of β -glucans is very different depending on the source of origin. β -glucans are among the compounds that will be increasingly studied for their potential applications in various industrial sectors. This is supported by scientific studies that highlight their diverse multifunctional properties; by the growing trend of consumers preferring „clean label” products without additives and other factors leading to the development of new functional ingredients such as β -glucans.

Currently, β -glucans have a wide range of applications in the food, pharmaceutical and cosmetic industries. However, their potential is not yet fully realized. Further research is needed to optimize the extraction, purification, drying and utilization of β -glucans in different fields.

Acknowledgments: This study was supported by the research project „Valorisation de coproduits vinicoles moldaves: identification et caractérisation d'agents multifonctionnels”, funded the Francophone University Agency (AUF) and through the State Project 20.80009.5107.10 „Personalized nutrition and smart technologies for my well-being”.

Keywords: β -glucans, extraction, value-added products, valorization.

COOKED PRODUCTS OF POULTRY COMBS AND SUBSTANTIATION OF THEIR SHELF LIVE CAPACITY

Patsera Nataliia, Voitsekhivska Liubov, Verbytskyi Sergii

*Institute of Food Resources of the National Academy
of Agrarian Sciences, Kyiv, Ukraine*

E-mail: tk140@hotmail.com

The aim of the work it is described herewith has been set as substantiation of possibility and expediency of using poultry combs as food raw materials. According to the plan of research, physical and chemical parameters of combs of chickens and roosters were determined and shelf life prediction substantiated.

The study of the physical and chemical composition, the quantitative content of the main microelements, the amino acid composition was carried out in the laboratories of IFR NAAS according to generally accepted methods and instructions in the industry. The object of research was a poultry by-product, namely the combs of hens and roosters, obtained at the domestic poultry processing facilities of Private Enterprise „Ular” in Lviv region and „Magrok” Ltd in Dnipro city (both - Ukraine).

Results of the research showed that combs of chickens and roosters had characteristic properties high water content, a significant part of which (up to 75%) is in a bound state, low fat content. The pH value was close to neutral.

The amino acid composition was also determined. A high content of hydroxyproline and proline was revealed (5.0 and 1.1 times, respectively, more than in the meat of chickens of the first category), which indicates the presence of a significant amount of connective tissue proteins in the combs. In combs, a high content of macro- and microelements was found in comparison with the meat of chickens of the first category: the content of iron is 15 times more, zinc – 2 times, chromium – 112 times. No limiting amino acids were found in chicken combs.

A technological scheme for the processing of poultry combs at poultry processing enterprises is proposed. The amino acid and microelement composition of the said raw materials was also analyzed from the point of view of nutrient adequacy. It is concluded that cooked poultry combs are nutritious and technologically acceptable meat products. Since the formulation of these products includes cooked muscle and collagen-containing meat raw materials, they are a typical example of perishable products of meat processing enterprises. To scientifically predict safe storage periods of the cooked combs mathematical modeling methods shall be applied incl. the method of a full factorial experiment.

Acknowledgments: This study was supported by the research project No. 0123U100967 „Substantiation of biotechnological treatment of by-products of poultry processing”, funded by Ministry of Education and Science of Ukraine.

Keywords: *chickens, factorial experiment, hens, poultry by-products, poultry combs, roosters, shelf life, slaughter poultry.*

IMPROVING THE NUTRITIONAL VALUE OF FOOD BY USING HORTICULTURAL BY-PRODUCTS

Ratu Roxana Nicoleta¹, Stoica Florina¹, Veleşcu Ionuţ Dumitru¹, Talpă Sandu¹, Arsenoia Vlad Nicolae¹, Postolache Narcisa Alina²

¹, „Ion Ionescu de la Brad” University of Life Sciences,
Faculty of Agriculture, Iasi, Romania

²Research and Development Station for Cattle Breeding Dancu, Iasi, Romania

E-mail: roxana.ratu@gmail.com

Horticultural by-products are often overlooked in traditional farming methods, but they have become a useful resource in the quest for food production that is sustainable and good for the environment. This abstract talks about the many benefits of using horticultural by-products in the food production process. It shows how these by-products could change customer tastes and habits.

Traditionally, horticultural by-products like food residues, peels, seeds, and parts that were thrown away were seen as waste. But new ways of doing things in agribusiness and food science have shown their untapped promise. By using these waste products for something else, not only do we help the earth, but we also get a lot of other benefits. These waste products are full of bioactive compounds, dietary fibers, and antioxidants, which make food items healthier. Also, they can be used as natural additives to improve texture, taste, and shelf life. This means that synthetic additives can be used less often.

People are becoming more aware of sustainability and health, so they are becoming more interested in goods that use horticultural by-products. These people know that wasting less food is good for the earth and has a positive effect on their carbon footprint. Also, consumers who care about their health like the fact that by-products are naturally good for their health. Because of this changing customer demand, food producers and manufacturers are putting by-products into a wide range of products, from functional foods to snacks and drinks.

In the present study, pumpkin skin and black grape skin were used to improve the nutritional value of two dairy products yogurt and a semi-hard cheese.

Keywords: by-products, cheese, yogurt, food.

SESSION VII - ECONOMICS OF AGRI-FOOD SECTOR AND RURAL DEVELOPMENT

Subsection - 7.1 Economy, business and administration

CZU: 631.15:634.7

SPECIFICITIES OF THE LOGISTICS ACTIVITY IN THE SEA BUCKTHORN PRODUCING ENTERPRISE

Mirza Sergiu, Onofrei Oleg

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: sergiu.mirza@tem.utm.md

Sea buckthorn production enterprises fall into the category of production enterprises in which the fundamental concepts in logistics are the concepts of supply chain, logistics system, logistics functions, logistics materials, services, financial and information flows. The purpose of the given work is to highlight the concepts of logistic activity within the enterprises producing sea buckthorn. The tasks of the paper are found in the research of the emergence of the notion of logistics, the establishment of logistics flows in the sea buckthorn producing enterprise, the delimitation of all logistic operations along the route of the material flow within the sea buckthorn producing enterprise, the establishment of logistics functions for the sea buckthorn producing enterprises, establishing the functional areas of logistics within the company producing sea buckthorn. In this paper a number of scientific and empirical research methods and their components based on analysis and synthesis, comparison, graphical presentation of the results obtained have been used. The research has an interdisciplinary, descriptive and applicative character with a logical-deductive approach. The research focused on the study of problems related to logistics as an integral part of marketing, in particular the process of analysis, planning and implementation of logistics operations, principles, functions, methods, with the help of which the established objectives are achieved. In the logistics activity of the white hawthorn enterprise, initial attention needs to be paid to reducing the total costs associated with the procurement process, as the costs of managing procurement in various areas of production vary from 40 to 60% in the production cost structure.

An important aspect of dealing with intermediaries is to recognize that intermediaries are independent suppliers and that marketing of the white currant enterprise should be directed to them, not through them. The sales process includes stock management and physical distribution. Both parts can be powerful marketing tools when used effectively. These areas in sales logistics can not only help control costs, but also significantly improve customer service levels.

Acknowledgments: This study was supported by the research project „Development of the technology of production of white currant in ecological system and processing of fruit and biomass”, with the number 20.80009.5107.13., funded by National Agency for Research and Development.

Keywords: *logistics activity, procurement logistics, production logistics, sales logistics, sea buckthorn production enterprise.*

SUSTAINABLE DEVELOPMENT: SHAPING A NEW PARADIGM

Bujor Tatiana, Corețchi Boris

State University of Moldova, Chisinau, Republic of Moldova

E-mail: tatiana.bujor@usm.md

The relevance of the researched theme „Sustainable Development: shaping a new paradigm”, remains highly pertinent in today's world. With increasing climate change, the depletion of natural resources, and growing social inequalities, the concept of sustainable development represents an essential approach to addressing these major challenges. The aim is to explore the concept of sustainable development and emphasize the importance of three key aspects of sustainability: the economic aspect, the environmental aspect, and the social aspect. Additionally, it highlights the complexity and challenges associated with these aspects and raises dilemmas that may arise in attempting to balance these objectives. In 1987, when the World Commission on Environment and Development presented its report titled „Our Common Future”, the goal was to resolve the dilemma between environmental protection and development objectives by defining the concept of sustainable development. In subsequent discussions and the application of this concept, the general importance of three key aspects of sustainable development has been recognized: *economic aspect* - a sustainable economic system must be capable of continuously producing goods and services to maintain manageable levels of governance, avoid excessive accumulation of external debt, and prevent significant imbalances in economic sectors that could affect agriculture or industrial production; *environmental aspect* - a sustainable ecological system must protect natural resources by maintaining a balanced basis for them, avoiding the overexploitation of renewable resources, and preventing the depletion of non-renewable resources, only if adequate alternatives exist. This involves protecting biodiversity, maintaining atmospheric stability, and other ecosystem functions that are not typically considered economic resources; *social aspect* - a sustainable society must have a distribution system that ensures access to a complete range of social services, including healthcare and education, promotes gender equality, and implements responsible policies and participation mechanisms.

It is evident that these three aspects of sustainability bring numerous challenges, complicating the initial, simple definition. The expressed or implied goals are complex and bring dilemmas regarding the balance of these objectives and the assessment of success or failure. For example, what happens if securing adequate food and water reserves requires a change in land use that could reduce biodiversity? Or if clean energy sources are more expensive, potentially increasing the burden on the poor, who spend a larger proportion of their daily income on these resources? How do we choose to prioritize these objectives?

In this context, sustainable development becomes a complex process that requires considering multiple aspects and interests, as well as ongoing efforts to find equitable and sustainable solutions.

Keywords: climate change, paradigm, resilience, sustainable development, sustainability.

THE MODERNIZATION OF HIGHER EDUCATION: EMPLOYMENT AND WORKING CONDITIONS IN ACADEMIA

Muntean Neli, Muntean Iulian

Technical University of Moldova, Chisinau, Republic of Moldova

E-mail: neli.muntean@adm.utm.md

Choosing a career in academia and then rising through the ranks requires considerable effort, dedication and time. Thus, this paper discusses selected aspects of employment and working conditions in academia, looking, in particular, at job security of academics, the conditions of employment in academia in the European countries in comparison with Republic of Moldova regulations. Therefore, the research question is: Whether the academic profession offers sufficient benefits that would compensate such a personal commitment (investment)? The concept of terms and conditions of employment refers to the contractual employment arrangements between employer and employee. When discussing contractual arrangements, a distinction must be made between permanent contracts and fixed-term (or temporary) contracts. The first type of contract is generally associated with a high degree of job security, while the second type - with less stable and less secure employment conditions. Starting from the above distinction, this article first looks at the extent to which the academic profession benefits from secure contractual arrangements. The second part enlarges the first perspective by looking at the employment status of academics, namely whether they benefit from civil servant status or whether they have an employee status. The third part looks at whether employment conditions in academia are changing over time, and, if so, in which direction. The study was conducted on a sample of 36 countries. The data is mainly based on information gathered by the Eurydice Network in March and April 2016. The Eurydice data collection was based on an in-depth questionnaire prepared jointly by Erasmus+ Education and Youth Policy Analysis – a unit of the Education, Audio-visual and Culture Executive Agency (EACEA), and the National Units of the Network. The research methods used in this paper are: data collection, data processing, comparison, and descriptive analysis. The results of this study are very important when they call for better working conditions including transparent and fair recruitment procedures of academics, especially in the Republic of Moldova. While in almost all European countries the higher education sector offers both fixed-term and indefinite job opportunities, in some countries all academics are employed on fixed-term contracts (Republic of Moldova, Latvia and Slovakia). Secondly, contractual stability is largely determined by the career stage, with junior academics commonly facing more precarious employment conditions compared to their senior counterparts. More, the type of employment contract of academics as well as the ratio of permanent and temporary contracts are a focus of external quality assurance in some higher education systems.

Keywords: academic staff, employment aspects, higher education, job security, working conditions.

Subsection - 7.2. Finance, accounting and economic analysis

CZU: 336.6:347.736

ANALYSIS OF NATIONAL AND INTERNATIONAL CORPORATE BANKRUPTCYS DYNAMICS

Muntean Neli¹, Fusaru Irina¹, Valuta Gabriela²

¹Technical University of Moldova, Chisinau, Republic of Moldova

²Academy of Economic Studies of Moldova, Chisinau, Republic of Moldova

E-mail: gabriela.valuta89@gmail.com

Business bankruptcy is a complex economic, social, and legal process. It represents a macroeconomic problem and has a lot of negative effects, not only at the level of the company and its employees, but also at the level of the country and society. Analysing several meanings regarding bankruptcy the authors concluded that most studies use a purely legislative definition of bankruptcy. Although in developed countries the first studies on the evolution and prevention of bankruptcy date back to the beginning of the 20th century, in Eastern Europe, due to several factors, including the geopolitical situation and the introduced economic system, the interest in this direction of research emerged in the early 1990^s. More than it, the interest to the bankruptcy's dynamics increased especially during the COVID 19 pandemic period, when a big number of firms were forced to cease their economic activities. Therefore, the ability to analyse the dynamics of number of corporate bankruptcies of a country is a benefit for all type of external and internal users. The main objective of the article is to analyse the dynamics of business bankruptcy at national and international level, as well as to make a comparative analysis of business bankruptcies at national level according to types of economic activity and legal forms of enterprises. The study was conducted on a sample of 40 countries over the period 2013-2022. The data was collected from Euler Hermes, Allianz Research and Reports published by state institutions of the Republic of Moldova. The phenomenon of corporate bankruptcies must be treated as a relevant phenomenon, but not a chaotic one, and the analysis of corporate bankruptcy dynamics is relevant because it aims to identify future trends in the number of bankruptcies. The research methods used in this paper are data collection, data processing, comparison, index calculation and descriptive analysis. Examining trends allows the identification and analysis of the main trends that appear within the analysed phenomenon. As a result, almost all national governments tried to support and provide extensive aid to firms and affected branches. That is why; the number of corporate bankruptcies in Europe does not reflect the reality.

Bankruptcies are not a mass phenomenon, they take place often enough, therefore their dynamic analysis is relevant. The bankruptcies statistics performed in this research paper on the base of the economies of European countries represent a strong confirmation of this fact. More than it, this paper may provide relevant information for another research on this topic.

Keywords: *Bankruptcy, dynamic analysis, European countries, indices, Republic of Moldova.*