

## PROSPECTIVES OF DEVELOPING SPECIALTY MAIZE GERMPLASM

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The improvement of the maize seeds quality to the increased protein content, essential amino acids in the protein (lysine, tryptophan), amylopectin in the endosperm, and other biochemical compounds, constitute traditional strategic directions for over 50 years developed in our country, started by the genetics and breeding school of academician Paliu Andrei. The basis of these researches were the successes recorded at the worldwide and national levels regarding the increase of the protein content in the seeds through pedigree selection, as well as the discoveries in the 60s of the last century the biochemical effects of some recessive genes such as opaque2 (o2) and floury2 (fl2). In the homozygous state, these genes determine a floury consistency of the endosperm and modify its chemical composition, causing an increased content of lysine and tryptophan in the seed protein. The research materialized through the creation of isogenic lines and special hybrids, in which genotype were incorporated mutant endosperm genes (o2, fl2, su1, su2, wx1, ae, etc.) that modify the protein and carbohydrate complex in the endosperm.

In the last decade, there has been an expansion and intensification of research activities in this direction in order to increase genetic variability. In 2016, the special maize collection was enriched with more than 30 lines and sources from research institutions of our country and abroad. Through the polyploidy method, tetraploid forms of maize carrying o2, wx1, fl2, su1, su1o2 genes were developed. As a result of collaboration with Iowa State University (USA), haploid inducers from which tetraploid forms were also obtained, completed our working collection. Germplasm development and study of genetic variability, in order to exploit it in fundamental and applied research, requires the approval of new methods for the identification of maize genotypes at the protein and molecular levels, complementary to the biochemical direction of the quality studying of the newly created genetic background. In this sense, based on the ongoing project 20.80009.5107.21, the Applied Genetics and Biotechnologies laboratory was created within Technical University of Moldova (Agronomy and Environment Department).

Therefore, the success of creating a new working genetic pool of mutant forms of maize for special purposes depends on the effectiveness of capitalizing on the rich experimental research initiated and carried out to date, as well as on the continuation of this research by using modern research methods and applying results in the agricultural science of the Republic of Moldova.

**Keywords:** *maize, endosperm genes, quality traits, germplasm improvement.*