Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol.11, Issue 1, 2011
ISSN 1844-5640

APPLE FOLIAR SURFACES IN FUNCTION OF FOLIAR FERTILIZER APPLICATION.

Valerian BALAN[1], Sergiu VAMASESCU[2]

[1]State Agrarian University of Moldova, Chisinau
44 Mircesti, sector Riscani, 2049, Chisinau, Repubic of Moldova, Phone: +373 312258,
Fax: + 373 312256 , E-mail : v.balan@uasm.md
[2]State Agrarian University of Moldova, Chisinau
44 Mircesti, sector Riscani, 2049, Chisinau, Repubic of Moldova, Phone: +373 312258,
Fax: + 373 312256 , E-mail : vamasescusergiu@yahoo.com

Corresponding author : v.balan@uasm.md

Abstract

In the period that the 2008- 2010 years we studied the influence of foliar fertilisation application device development and yield in apple foliage. The study took varieties: Golden Delicions, Florina and Idared 8 years old, grafted on M26 rootstocks. Distance of planting is 4x2 m as fertilizer to the foliage was 46% Urea in concentration of 0,4% to 1,2%in different stages of fruit development, Polyfeed (N19P19K19) at a concentration of 0,1% and $CaCl_2$ (0,5%-0,7%).The results showed that the use of foliar fertilisation stages provide conditions conductive to the growth of leaf area. The Golden Delicious variety is increased leaf area by 12,6% to 40,1% Idared variety, and 23,5% Florina variety is compared with control variant 21,4%- 26,3 thousands m^2/ha.

Key words**:** *Apple, Golden Delicious, variety,*

INTRODUCTION

In accordance with agro-industrial development strategy for the 2006- 2015years is expected to gradually replace the existing orchards, groves exhausted with productive potential of a new type based on advanced technologies for the production of fruit. [1, 2]
Foliar fertilisation, chemical and manual thinning fruits have a significant contribution to maintaining the physiological balance between growth and fructification and increasing the quantity and quality of fruit. [3]
Through proper nutrition through fertigation or foliar and made interventions on green shoots growing to create a balance between the fruit bud differentiation and their enjoyment that leads to consistent and quality output. These technical measures must be complemented by loads of fruit after binding rate setting fruit.

MATERIAL AND METHODS

The investigations were conducted during the 2008- 2010 years in the apple orchard S.A.'Zubresti', district Straseni planted with trees 1 year old. The plantation establishment was carried out in spring 2003 with fruit varieties Golden Delicious, Idared and Florina grafted on M26 rootstock. The distance of planting trees is 4 x2 m. Trees are driven by rows crown zone located from north to south.
The investigation on the development of the foliar fertilization in apple orchard is made stationary through research methods, field and laboratory. The variants are located in 4 repetitions each randomized trees in 32 variants. Agro-tehnical measures in the orchard are made in accordance with agro-technical guidance in force. Soil is maintained as field work by conducting an annual ploughing in winter and as needed or 3-5 cultivations. Urea 46%breast was used in different concentrations on fruit development stages. Solution consumption is 1000 litres per hectare. (Table 1).

Table 1 Scheme of experience.

Foliar fertilization performance period	Nutrient Concentration%			
	V1(control)	V2	V3	V4
Urea 46% active substance				
After flowering (75% of flowers have fallen).	Water	0.4	0.5	0.6
When fruits have the size of a peanut (fruit diameter reached 10-12 mm).	Water	0.7	0.8	0.9
When fruits have the size of a walnut (the fruit had reached 25-30 mm in diameter).	Water	1.0	1.1	1.2
Polyfeed (N19:P19:K19)				
When fruits are ripe state. (20-30 July).	Water	0.1	0.1	0.1
Calcium chloride ($CaCl_2$)				
With 2030 days before harvesting the fruit.	Water	0.5	0,6	0,7

RESULTS AND DISCUSSIONS

Following foliar fertilisation application (Table 2) with chemical fertilisation I 2008 at Golden Delicious variety the leaf area per hectare was in variant control of 14,1 thousand m^2/ha. The largest leaf area recorded 19,4 thousand m^2/ha value in variant 4 and that 17,7 thousand m^2/ha in variant three.

In 2009 the leaf surface in all variants have increased due to application of foliar fertilizers of different concentrations from 0,4%- 1,2% (Urea 46%N). The largest leaf area per hectare in 2009 was registered on the variety Golden Delicious in variant 4 with 20,6 thousand m^2/ha and the lowest in control variant with 16,7 thousand m^2/ha. Leaf area per hectare in variant 2 and 3 at Golden Delicious variety in 2009 were respectively 17,4 – 18,7 thousand m^2/ha.

In 2010 in second variant the leaf area was 24,8 thousand m^2/ha. The largest area was in variant 4 where the leaf area increased by 25 % to 2009 and amounted to 27,2 thousand m^2 to hectare.

The Idared variety, in 2008, leaf area was in variant control a 9,3 thousand m^2/ha, and the variant 4- 13,7 thousand m^2/ha or 47,3 % more than in variant control.

At Idared variety in 2009, leaf area increased significantly from 2008 and in control variant was more than 15,2 thousand m^2/ha, which constitutes 63,4% more than in 2008.

Following foliar application of foliar surface treatments significantly increased in all variants and comprised in 17,7 thousand m^2/ha to 21,4 thousand m^2/ha. Following applications of foliar fertilizer treatments (Urea 46%N) increased leaf area, and in variant 2 where Urea 46% concentrations was 0,4: 0,7%: 1,0%: leaf area was of 17,7 thousand m^2/ha.

The largest leaf area was recorded in variant 4 where the previous year 2008 increased by 43% and comprised 20,9 thousand m^2/ha.

Table2.The influence of foliar fertilisation on the leaf surfaces at Golden delicious, Florina and Idared varieties.
(M26 rootstock, planting distances 4x2 m S.A. 'Zubresti'. 2008-2010)

variant	Leaf area per unit of area thousands m^2/ha		
	2008 year	2009 year	2010 year
Golden Delicious			
1	14,1	16,7	21,4
2	15,1	17,4	24,8
3	17,7	18,7	26,4
4	19,4	20,6	27,2
$DL_{5\%}$	0,53	1,76	0,63
Idared			
1	9,3	15,2	21,2
2	10,5	17,7	21,5
3	11,3	21,4	22,2
4	13,7	20,9	35,8
$DL_{5\%}$	0,96	2,33	1,07
Florina			
1	12,7	18,3	26,2
2	16,3	18,9	27,3
3	16,7	19,6	30,7
4	17,0	19,8	33,8
$DL_{5\%}$	1,49	2,68	1,11

In 2010 the leaf surfaces has a smaller difference between the variants and the lowest index was recorded in variant control and second variant was at 21,2 to 21,5 thousand m^2/ha respectively.

The largest leaf area in 2010 at Idared variety was registered in variant 4 with 35,8 thousand m^2/ha. m^2/ha). Following foliar spraying with chemical fertilisation breast Urea 46% N.

Difference between the variants is large and is from 16,3 thousand m^2/ha in variant 2 and up to 17.0 thousand m^2/ha in variant 4.

The Florina variety leaf area in 2008 was the lowest recorded in variant control (12,7 thousand

In 2009 the leaf surface showed higher values in variant control Florina varieties and it was 18,2 thousand m^2/ha.As in the previous year in the three variants where they were applied foliar fertilizers (Uree 46%N), leaf surface were higher that control but between variants were not so substantial were 19,6 thousand m^2/ha.

In 2010 the Florina varieties observe a more pronounced difference between the variants compared with the study years 2008 – 2009. The lower leaf surface was recorded in control variant of 26,2 thousand m^2/ha. The largest leaf area was recorded in the index of variant 4 with 33,8 thousand m^2/ha. In second variant there 27,3 thousand m^2/ha to 20,7 thousand m^2/ha in variant three.

CONCLUSIONS

Following foliar fertilisation application (Table 2) with chemical fertilisation I 2008 at Golden Delicious variety the leaf area per hectare was in variant control of 14,1 thousand m^2/ha. The largest leaf area recorded 19,4 thousand m^2/ha value in variant 4 and that 17,7 thousand m^2/ha in variant three.

At Idared variety in 2009, leaf area increased significantly from 2008 and in control variant was more than 15,2 thousand m^2/ha, which constitutes 63,4% more than in 2008. Following foliar application of foliar surface treatments significantly increased in all variants and comprised in 17,7 thousand m^2/ha to 21,4 thousand m^2/ha. Following applications of foliar fertilizer treatments (Urea 46%N) increased leaf area, and in variant 2 where Urea 46% concentrations was 0,4: 0,7%: 1,0%: leaf area was of 17,7 thousand m^2/ha.

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