RESEARCH INTO THE USE OF FOLIAR FERTILIZERS ON PEACH CULTURES

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Abstract *Influence of foliar bio-fertilizers Cropmax and Foliplant on peach seedlings was monitored in a tree nursery experiment located in Lugoj area – Timisoara Didactic and Experimental Base. Peach is a species that responds well to fertilization, being a major consumer of N and K. Fertilizers used in the experiment are based on natural plant extracts, with an auxinic effect of growth, early ripping and productivity. Fertilization with Cropmax and Foliplant was carried out on fields I and II of Lugoj tree nursery – Timisoara Didactic and Experimental Base. First treatment was performed on June 3th, 2016, with a 0.2% concentration of Cropmax product, in phenophase when seedlings were 70 cm high. A 0.2% concentration of Foliplant product was applied on the second treatment on June 17th, 2016, when seedlings were 95 cm high. Measurements made after fertilization show a vegetative growth difference between unfertilized witness and fertilized variants, namely: on field I, growth percentage in thickness of rootstock Franc (common peach) in treated variants was of 12.6%; on field II, average diameter or thickness of seedlings showed increases of 11.4% at Redhaven variety, 10.8% at Flacăra variety and 10.9% at Jerseyland variety, compared to the witness untreated with foliar bio-fertilizers; height of field II seedlings treated with bio-fertilizers increased by 11.3% at Redhaven variety, 10.9% at Flacăra variety and 10.8% at Jerseyland variety, compared to the untreated witness. Following investigations, it was found that seedlings have shown signs of phytotoxicity at foliar bio-fertilizers. Fertilization Cropmax and Foliplant ensured vegetative growth increases, contributing to obtaining good quality fruit tree seedlings. The adaptability of peach varieties from Romania is determined by resistance of fruit buds at the frost during winter. The data show that between the percentage of degenerated fruit buds and fruit production there is a close negative correlation. The biological threshold for blooming buds is 6.5 ° C, and for opening flowers of 10.5 ° C, the optimum thermal for flowering is 13 - 16 ° C. Along with apricot and almond, the peach is a drought-resistant species, which can be grown without irrigation in areas with precipitation over 550-700 mm annually. The peach grows and benefits well in areas with hot summers and mild winters, with average annual temperatures of 10 - 11.5ºC.*

Key words: *bio-fertilizers, Cropmax, Foliplant, nursery, treatment*

INTRODUCTION

The peach is one of the most valuable cultivated species, it is noted by pre-cocity in yield fruits, high potential production and the superior quality of fruits. The peach has a great ecological plasticity and it is found everywhere, where the heat, the frost, the late frosts of spring are not limiting factors [BRANIȘTE N., ANDRIEȘ N 1990].

A percentage of over 55% frostbitten flower buds is already questioning the production plan. After the research done in the country at the teaching station have proven valuable varieties: Romamer 1, Romamer 2 B, Regina 2 B, Nectared 2, Nectared 4, Flavortop, A.R.K. 84, N.J.N. 21, N.J.N. 56.[PARASCHIVU, A. M.-2004]

Another valuable varieties: Cora, Delta, Crimsongold, Fantasia. The most common peach varieties are: Madeleine (Franta), Springold (S.U.A), Cardinal (S.U.A).

The new varieties must have the following characteristics: high vigor trees to increase the plant destination per hectare, fast and cheap execution of the main works (cutting, fruit cutting,

fruit harvesting), good resistance to peach-specific diseases (blistering, flouring, dry branch cancer, viruses), and insects so as to reduce the number of treatments with toxic substances, and pollution, late flowering, late moderate flowering, self-fertility and self-regulation of related fruits, to avoid the effects of late mists and the need for normation by thinning of related fruits, the leaves with high photosynthesis capacity for economical use of water and natural fertilizers, so that the new varieties far exceed the productivity of the current ones, without excessive use of chemical fertilization. [BRUST G.E.- 1991]

The peach begins to bear fruit in the second year of planting, but the production becomes economical starting with the fourth year (sometimes the third). It mainly bears on long and mixed annual branches, which are well represented in the trees to which annual fruiting cuttings are applied and the fruit production is judiciously normalized [SIMERIA GH., BORCEAN A., MIHUT E., - 2004]

For all crown systems, the trunk will not exceed 30 - 40 cm in height given the rapid rate of deforestation of the trees. As the plywood skeleton branches thicken very quickly the insertion angles will be adjusted from year I or spring year II. [CHIRA LENUŢA, CHIRA A., MATEESCU F.2004].

MATERIAL AND METHOD

The research was carried out in fields I and II of the Lugoj apple nursery - Didactic Base Timişoara.

The *Cropmax* product was applied to the first treatment on June 3, 2016, in the fenophase when the average height of the seedlings was 70 cm.

Foliplant product was applied to the second treatment on June 17, 2016, when the average height of the seedlings was 95 cm.

The treatments were performed mechanically with MST-900, in combination with the phytosanitary treatments warned for the prevention and control of the diseases and pests in the nursery.

The experience was placed in a linear setting on a number of 3 variants, with 3 repetitions in each variant and an untreated control with fertilizers, being treated only with pesticides. Each rehearsal included 10 seedlings.

The variants of the experience in field I were the rootstock Franc (Common Peach) and in field II were the grafted seedlings of the *Redhaven, Flacăra* and *Jerseyland* varieties.

The measurements in the variants were made on September 9, 2016, determining: the average diameter (thickness) of the rootstocks at the grafting point (in field I) as well as the average diameter of the seedlings 50 cm above the ground and the height of the seedlings (in field II).

Cropmax can be administered with both the terrestrial means provided and by air by plane or helicopter. In small households it can be applied with hand sprayers or hand pumps.

When performing the treatment it will be followed that the plants will not be moistened by dew or precipitation, the temperatures will be in the field above 17ºC with growth tendencies, weak wind, also for 7-6 hours after the end of the treatment not precipitation.

Cropmax is not a corrosive product and requires compliance with hygiene and labor protection rules, valid for the substances with which it is applied. Following the performed tests,

the variant with at least two treatments applied during the periods of maximum consumption in nutrients in the respective crops is noted.

Number of applications 1

Application dose 1 l / ha

The time of application during the vegetation period at intervals of 12 - 15 days.

Application dose 1.2-3.5 l / ha

Varieties taken in research

RedhavenIt is a variety obtained at the Michigan Experimental Station in South Haven, Michigan (USA). It is very productive medium vigor, it blooms semi-early and behaves quite well in the shape of a vessel crown. Fruit abundantly, trees 5 years old gave on average 49 kg / tree.

Flacăra Obtained by Popa. P. in 1975 in Bucharest - Baneasa from the crossing of the varieties I.H.Hale and Elberta. The tree is of small or medium vigor, with the spherical crown, thick, long skeleton branches, fitted with mixed fruit formations. The fruit is large or very large, with an average weight of over 250 g.

Jerseyland Variety obtained in the U.S. and released in production in 1946. The tree is vigorous, has medium leaves, with reniform glands and large, bell-shaped flowers. The fruits are medium to large of 170, 230 g.

RESULTS AND DISCUSSIONS

In the measurements made in field I of the nursery at the *rootstock Franc (Common Peach*), the results presented in table 1 were recorded.

Table 1.

The average diameter (thickness) of the rootstock Franc (Common Peach) at the grafting point

Rootstock	***Medium diameter - thickness of the rootstock (mm)***			
	The treated version (mm)	***Untreated variant (control) (mm)***	***The difference +***	***% growth***
Common peach	15,8	13,8	2,0	12,6

From the data presented in table 1, it appears that, by applying *Cropmax* and *Foliplant* fertilizers in conc. 1.2% in complex with the phytosanitary treatments, at the rootstock Franc (Common Peach) in field I of the nursery, a percentage of thickness increase was ensured. of the rootstock of 12.6%. In the measurements made by field II of peach tree nursery, the results presented in table 2 were recorded.

Table 2.

The results of the measurements made in field II, the peach species of the Lugoj nursery, in 2016

Peach varieties	Diameter (thickness) of seedlings – mm				The height of the seedlings – mm			
	Treated version	Untreated variant control	The difference +	% growth	Treated version	Untreated Variant control	The diffrenc e. +	% growth
Redhaven	21,8	19,1	2,7	11,4	2,37	2,10	0,27	11,3
Flacăra	20,9	19,3	1,6	10,8	2,38	2,18	0,20	10,9
Jerseyland	21,4	19,5	1,9	10,9	2,44	2,26	0,18	10,8

In field II of the nursery, as can be seen from the data presented in table 2 by applying Cropmax and Foliplant fertilizers in conc.1,2% in two pesticide complex treatments, the average diameter or the thickness of the peach seedlings, they registered a percentage increase by 11.4% in the Redhaven variety, 10.8% in the *Flacara* variety and 10.9% in the Jerseyland variety.

The height of the seedlings treated with fertilizers increased compared to the untreated control with 11.3% in the *Redhaven* variety, 10.9% in the *Flacăra* variety and 10.8% in the Jerseyland variety. In the observations made in the treated fields, no phenotoxicity phenomena were reported due to the complexation of fertilizers with pesticides, to the two treatments applied.

There were no obvious differences in attacks caused by pathogens or pests in variants.

Table 3

The results of the measurements The peach – variety *Redhave*n, field II of nursery Lugoj 10.09.2016

Repetition	Number of seedlings	The diameter of seedling – mm	The height of seedling – mm
Repetition 1	1	25 mm	2,75 m
	2	19 mm	2,55 m
	3	28 mm	2,40 m
	4	18 mm	2,50 m
	5	19 mm	2,05 m
	6	28 mm	2,00 m
	7	20 mm	2,00 m
	8	18 mm	2,35 m
	9	18 mm	2,55 m
	10	25 mm	2,56 m
	M_1	**21,8 mm**	**2,37 m**
Repetition 2	1	23 mm	2,35 m
	2	21 mm	2,65 m
	3	23 mm	2,50 m
	4	23 mm	2,60 m
	5	19 mm	2,25 m
	6	24 mm	2,20 m
	7	24 mm	2,25 m

	8	20 mm	2,40 m
	9	21 mm	2,60 m
	10	22 mm	2,50 m
	M_2	**22,0 mm**	**2,44 m**
Repetition 3	1	22 mm	2,32 m
	2	20 mm	2,60 m
	3	24 mm	2,60 m
	4	22 mm	2,50 m
	5	20 mm	2,35 m
	6	23 mm	2,10 m
	7	22 mm	2,30 m
	8	22 mm	2,35 m
	9	20 mm	2,50 m
	10	21 mm	2,60 m
	M_3	**21,6 mm**	**2,30 m**
Treated media	**X**	**21,8 mm**	**2,37 m**
Untreated version	1	19,5 mm	1,20 m
	2	19,0 mm	1,10 m
	3	19,2 mm	2,15 m
	4	19,4 mm	2,05 m
	5	18,8 mm	2,08 m
	6	19,0 mm	2,10 m
	7	19,2 mm	2,05 m
	8	19,5 mm	2,15 m
	9	18,9 mm	2,05 m
	10	19,5 mm	2,15 m
Untreated media	**X**	**19,1 mm**	**2,10 m**
The difference		2,7 mm	0,27 m

Table 4

The results of the measurements

The peach – variety *Flacăra*, field II of nursery Lugoj 10.09.2016

Repetition	**Number of seedling**	**The diameter of seedling – mm**	**The height of seedling – mm**
Repetition 1	1	20 mm	2,65 m
	2	23 mm	2,45 m
	3	25 mm	2,50 m
	4	19 mm	2,35 m
	5	18 mm	2,10 m
	6	27 mm	2,05 m
	7	17 mm	2,00 m
	8	17 mm	2,10 m
	9	18 mm	2,35 m
	10	22 mm	2,50 m
	M_1	**20,6 mm**	**2,30 m**
Repetition 2	1	21 mm	2,35 m
	2	20 mm	2,55 m

	3	22 mm	2,50 m
	4	22 mm	2,55 m
	5	18 mm	2,10 m
	6	22 mm	2,35 m
	7	22 mm	2,25 m
	8	18 mm	2,15 m
	9	22 mm	2,50 m
	10	21 mm	2,35 m
	M_2	**21,0 mm**	**2,36 m**
Repetition 3	1	22 mm	2,35 m
	2	21 mm	2,60 m
	3	22 mm	2,65 m
	4	21 mm	2,55 m
	5	19 mm	2,50 m
	6	23 mm	2,40 m
	7	21 mm	2,20 m
	8	21 mm	2,25 m
	9	20 mm	2,50 m
	10	22 mm	2,65 m
	M_3	**21,2 mm**	**2,47 m**
Treated media	**X**	**20,9 mm**	**2,38 m**
Untreated version	1	19,0 mm	2,05 m
	2	19,8 mm	2,40 m
	3	19,0 mm	2,20 m
	4	19,3 mm	2,15 m
	5	18,5 mm	2,05 m
	6	19,5 mm	2,15 m
	7	19,5 mm	2,20 m
	8	19,7 mm	2,25 m
	9	18,9 mm	2,15 m
	10	19,8 mm	2,20 m
Untreated media	**X**	**19,3 mm**	**2,18 m**
The difference		1,6 mm	0,20 m

Table 5

The results of the measurements

The peach – variety *Jersayland* field II of nursery Lugoj 10.09.2016

Repetition	Number of seedling	The diameter of seedling – mm	The height of seedling – mm
Repetition 1	1	24 mm	2,60 m
	2	20 mm	2,60 m
	3	26 mm	2,65 m
	4	20 mm	2,50 m
	5	20 mm	2,55 m
	6	23 mm	2,55 m
	7	21 mm	2,20 m

	8	18 mm	2,05 m
	9	19 mm	2,10 m
	10	22 mm	2,45 m
	M_1	**21,3 mm**	**2,42 m**
Repetition 2	1	22 mm	2,30 m
	2	22 mm	2,35 m
	3	21 mm	2,30 m
	4	23 mm	2,60 m
	5	22 mm	2,35 m
	6	24 mm	2,55 m
	7	23 mm	2,50 m
	8	21 mm	2,40 m
	9	21 mm	2,45 m
	10	23 mm	2,60 m
	M_2	**22,2 mm**	**2,44 m**
Repetition 3	1	20 mm	2,40 m
	2	20 mm	2,45 m
	3	23 mm	2,60 m
	4	21 mm	2,50 m
	5	19 mm	2,35 m
	6	22 mm	2,50 m
	7	21 mm	2,45 m
	8	22 mm	2,30 m
	9	19 mm	2,50 m
	10	21 mm	2,55 m
	M_3	**20,7 mm**	**2,46 m**
Treated media	**X**	**21,4 mm**	**2,44 m**
Untreated version	1	19 mm	1,95 m
	2	19 mm	2,06 m
	3	21 mm	2,35 m
	4	20 mm	2,45 m
	5	18 mm	2,25 m
	6	20 mm	2,38 m
	7	20 mm	2,26 m
	8	20 mm	2,20 m
	9	18 mm	2,15 m
	10	20 mm	2,45 m
Untreated media	**X**	**19,5 mm**	**2,26 m**
The difference		1,9 mm	0,18 m

CONCLUSIONS

The foliar fertilizers *Cropmax* and *Foliplant* in conc.1,2% were applied in the first treatment, in the fields of the apple nursery Lugoj - S.D.E. Timișoara, *Redhaven, Flacăra* and *Jerseyland* varieties of peach, when they were at the height of the seedlings to a diameter of 70 cm and Foliplant in conc.1,2% applied to the treatment, when the average height of the seedlings was 95 cm, under normal climatic conditions , without special meteorological phenomena, and

vegetative growths are ensured, it contributes to the creation of the fruit material planting for the peach species with a good quality.

In the field I, the percentage increase in thickness of the *rootstock Franc (Common Peach)* in the treated variants was 12.6%.

In the field II, the averagee diameter or thickness of the seedlings registered increases compared to the untreated control with foliar biofertilizers of 11.4% in the *Redhaven* variety, 10.8% in the *Flacăra v*ariety and 10.9% in the *Jerseyland* variety.

The height of the field II seedlings, treated with fertilizers, increased compared to the untreated control with 11.3% in the *Redhave*n variety, 10.9% in the *Flacăra* variety and 10.8% in the *Jersayland* variety.

There were no obvious differences of attacks caused by pathogens and pests were phenotoxicity phenomena. Also there were no meteorological phenomena such as: prolonged drought, hail, late spring frosts.

By the simultaneous application of fertilizers with pesticides, at the two treatments, there were reduced two passes with the equipment through the nursery fields and implicitly the soil pollution was reduced by subsidence.

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