

UDC: 631.816.35:634.836

original scientific paper



Acta Agriculturae Serbica, Vol. III, 6 (1998) 39-43

A Study on the Applications of Leaf Suspension Fertilizers Lactofol (cuprozin) and Lactofol for Vineyards in Vine Growing

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Abstract: The paper presents the results of influence of leaf fertilisers Lactofol (Cuprozin) i Lactofol - leaf fertilizer upon the vegetative growth and yield of vine, sugar content and acidity.

Key words: vine, viticulture, Cuprozin, Lactofol - leaf fertilizer, fertilization.

Introduction

The recently created new generation of suspension fertilizers in Bulgaria for leaf feeding LACTOFOL for vines (L) and LACTOFOL with Cuprozin (C), needs to be considered.

In this regard, the present investigation relates to optimisation of the feeding regime of the vines and their protection against diseases.

The aim of this research was to study the effect of the vegetative treatment with LACTOFOL (C) and LACTOFOL (L) on the yield and quality of grapes, and the growth of the vine plant, of one winemaking variety and one dessert variety.

Material and method

The investigation was carried out in the period 1995-1997, in fructiferous vineyards, in the Experimental Vine Growing Station in Septemvry, on alluvial-delluvial soil. The grape varieties used were Pamid and Brestovitza. The Pamid vines were planted in 1996 on rootstock Shasla x Berlandieri 41B at distance 3/0,80 m, and the Brestovitza vines - 3,40/1,20 m. The training is modified Moser with a height of 100 cm.

The Pamid vines had 32 eyes (16 knots x 2 eyes) on every plant, and the Brestovitza variety - 28 eyes (2 branches x 10 eyes, and 4 knots x 2 eyes). The following variants were included in the experiment -scheme, with 4 repetitions on 40 vines for every variant:

V₀ - control variant - not treated with Lactofol, sprayed with Cuprozin - 0,3%;

V₁- treated with Lactofol (C) -1 l/dka (the technology of this variant does not include spraying with Cuprozin);

V₂ - treated with Lactofol (L) - I 1/dka and sprayed with Cuprozin - 0,3%;

After pruning, the entire vineyard was fertilized in furrows with combined fertilizer N10P10K10-10 kg/dka. The treatment was carried out simultaneously with the plant protection procedures with "Perla - 09" Sprayer, four times, during the following phenophases: before blossoming, after blossoming, pea bean" phase, and during berries variegation, softening respectively.

Phenological observations, measuring yield and its structural elements, as well as some biometric parameters have been done during the vegetation.

Results and discussion

The results of the leaf fertilizers effect on the yield and quality are shown in tables 1 and 2. The data show that the rise of yield from 1 ha, as compared to the control variant, for Pamid variety is: for V₁-108,5%, V₂ -111,3%, and for Brestovitza variety - V₁-104,7%, V₂-109,7%. The rise can be explained with the higher average weight of one bunch (table 2).

Tab.1. Effect of the leaf fertilizers on the yield

Variant	Number of bunches		Average weight of one bunch (g)		Yield from one vine (kg)		Yield from 1 ha (kg)		% compared to V ₀	
	Pamid	Bresto-vitza	Pamid	Bresto-vitza	Pamid	Bresto-vitza	Pamid	Bresto-vitza	Pamid	Bresto-vitza
V ₀	24.0	19.1	172.6	335.5	4.142	6.408	17230	15700	100	100
V ₁	23.8	18.8	188.8	360.8	4.493	6.711	18691	16442	108.5	104.7
V ₂	23.7	18.7	194.5	375.5	4.610	7.022	19178	17204	111.3	109.5

Tab.2. Effect of the leaf fertilizers on the quality

Variant	Sugars (%)		Acid (g/l)	
	Pamid	Brestovitza	Pamid	Brestovitza
V ₀	20.6	16.8	4.14	7.31
V ₁	19.8	16.6	4.34	7.57
V ₂	19.8	16.6	4.17	7.59

What draws the attention, is that in comparison to the control variant both varieties show slight fall in % of sugars, 0,2 and 0,8 % respectively, which is due to the higher yield from one vine.

The bunches used in the variants are less in number, but with higher average weight.

The acidity shows a slight trend towards rising. For Pamid variety, compared to the control variant, this rise is from 0,03g/l to 0,2g/l, and for Brestovitza variety - from 0,26g/l to 0,2 g/l.

According to A.C. Artunjan, V.C. Saturjan (1964), B. Bertucci (1995), the fertilization with minerals cannot provide the - necessary amounts of macro- and microelements during the critical stages of the vine growth. In other investigations, R.E.Yones (1980), G. Hudska (1976) and Y.C. Heman (1976); have found that this shortcoming can be overcome through plants leaves feeding.

The search of new active factors of influence upon productivity of vines is a fundamental trend in the countries with a well-developed Viticulture, C. Caramete et. Al (1978), A. Zembert (1976), M.S. Panero (1982), etc.

The Experimental Vine Growing Station in Septemvri has done considerable research and practical activities in this direction, J. Tzvetkov, M. Apostolova, K. Pondev (1994), M. Apostolova, K. Pondev, J- Tzvetkov (1996), K. Pondev, M. Apostolova, J. Tzvetkov (1996).

The data for length and weight of the mature annual shoot are given in table 3. There is evident increase compared to the control variant for both varieties. For Pamid variety the shoot's length increase in V₁ is 5,96%, and in V₂ - 7,95%. The weight of the annual shoot has risen in V, with 9,5 /o, and in V₂ - 11,5 /o. The same can be seen in the experiments with Brestovitza variety where the length of the shoot has risen in V₁ with 9,3%, and in V₂ - with 14%. Regarding the weight of the annual shoot, there is an increase of 7,4% in V and 19% in V₂.

Tab.3. Effect of the leaf fertilizers on the growth behavior

Variant	Length of one shoot (cm)		Weight of annual shoot (g)	
	Pamid	Brestovitza	Pamid	Brestovitza
V ₀	186.0	135	1268	972
V ₁	197.1	147.6	1389	1044
V ₂	200.8	154.0	1414	1157

No differences between the health status of the experimental vines were found in the three variants.

Conclusion

The experiment carried out with leaf fertilizers Lactofol (C) and Lactofol (L) on wine making variety Pamid and dessert variety Brestovitza, showed that both leaf fertilizers effect positively on the vegetative and generative characteristics. A rise of the yield with 8,5 -11,3% for Pamid, and 4,7 - 9,5% for Brestovitza, was obtained.

The three year investigations show that the leaf fertilizers can be used for feeding during the vegetation stage, at the following phases: before blossoming, after blossoming, pea bean" phase, and berries variegation, at a rate of 10 l/ha.

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PRIMENA FOLIJARNIH ĐUBRIVA LACTOFOL (CUPROZIN) I LACTOFOL ZA VINOVO LOZU ZA VREME VEGETACIJE

-originalni naučni rad-

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Rezime

Istraživanja su vršena u periodu od 1995.-1997. godine u vinogradu Eksperimentalne stanice Septemvri sa folijarnim đubrivima laktofol S laktofol L na prinos groždja, sadržaj šećera i kiselina i vegetativni potencijal kod sorti Pamid i Brestofida.

Utvrđeno je da folijarna đubriva služe kao dodatni izvor hranljivih materija koje su neophodne za rast i rodnost loze.

Tako da varijante đubrenja koje su primijenjene dovode do povećanja prinosa groždja od 4,7 do 11,3%.