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INVESTIGATION ON THE EFFECT OF LEAF FERTILISATION ON THE VEGETATIVE GROWTH AND YIELD OF VINE (C.V. PAMIA) GROWN ON DIFFERENT LEVELS OF BASIC NUTRITION
ISPITIVANJE UTICAJA FOLIJARNE ISHRANE NA VEGETATIVNI RAST I PRINOS LOZE (CV. PAMID), UZGAJANE UZ PRIMJENU RAZLIČITIH KOLIČINA OSNOVNOG ĐUBRIVA

Abstract

The paper present the results of influence of various leaf fertilisers (Sal-12, Foliar and Biofert-3) upon the vegetative growth and yield of vine, grown on different levels of basic fertilizers (NPK).

Key words: foliar fertilization, NPK, vine.

Izvod

U radu su prikazani rezultati ispitivanja uticaja folijarnih đubriva (Sal-12, Foliar i Biofert-3) na vegetativni porast i prinos vinove loze, uzgajana uz primjenu raznih doza osnovnog đubriva (NPK).

Ključne riječi: folijarna prihrana, N, P, K, vinova loza.

Introduction

The nutrition regime is on of the basic factors on which the growth and the yield of vine depends. The excessively increased fertilizer norms do not lead to adequate stimulation of the growth and generative performances of vine. The low norms of fertilization cannot provide the nessary quantities of nitrogen, phosphorus and potassium either. Besides, in different types of soil, even the independent mineral fertilization cannot ensure the basic nutritive elements (1,2,3,6) for the plants. Some authors (7,8,9,10) argue that this insufficiency could be compensated to a great

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extent by leaf feeding. However, this argument is not firmly supported. That is why we carried out this investigation which aim is to find out the effect of leaf feeding on the growth and yield of vine, grown on different levels of basic fertilization.

Material and methods

The investigation was carried out in the period 1990-1993 in a vineyard of Pamid cultivar. The vines trained on improved Mozer planted in spacing 3,40 x 1,20, the loading was 42 bds per vine. We have tested the effect of foreign leaf fertilizers used for vine leaf feeding, having different basic mineral fertilization with nitrogen, phosphorus and potassium (6 kg/dka) and doubling this norm in the separate variants. The leaf fertilizers Sal-12, Foliar and Biofert-3 were used. Four sprayings were applied with 2% solution of the corresponding fertilizer in every 14 days in the following phases: pro-bloom, after-bloom, pea phase and berry variegation. Indicators characterising the growth and the fruitbearing of vines were studied, as well as the content of nitrogen, phosphorus and potassium in their organs.

Results and discussion

Data of the effect of leaf feeding applied to different basic fertilisers on the growth performances and the yield of vines is presented in Table 1.

The greatest general length and mass of the annual growth, as well as the best yield from a vine are established, when the plants are leaf-fed with Sal-12 applied to $N_{12} P_6 K_6$ norm of basic mineral fertilisers. When Foliar is spread, the variant with the $N_6 P_6 K_6$ norm of mineral fertilisation had the maximum values of general length and weight of the annual growth. The best yield from a vine is established with the variant using this leaf fertiliser and $N_{12} P_6 K_6$ basic fertiliser.

The general length and weight of the annual growth of the vines treated with Biofert-3 have the greatest values in the variant with $N_6 P_6 K_{12}$ fertilisation norm, while the best yield is obtained with $N_6 P_6 K_6$ basic fertiliser.

The comparison of the effect of the there investigated leaf fertilisers on the vine yield shows that the feeding with Biofert-3 applied to $N_6 P_6 K_6$ mineral fertilisation increases to the maximum the degree of quantity of grape obtained from a vine.

Tab. 1. The effect of leaf feeding on the growth performances and the yield of vine

Uticaj ishrane lista na rast i prinos loze

Elements Variants Elementi Varijante	Indicators/Pokazatelji			
	General length (cm) Ukupna dužina	Mass of the annual growth (g) Masa godišnjeg rasta (g)		Yield of one vine kg Prinos po jednom čokotu (kg)
Sal 12				
N ₆ P ₆ K ₆	207,5	2392	0,180	13,257
N ₁₂ P ₆ K ₆	212,7	2464	0,176	13,942
N ₆ P ₁₂ K ₆	208,2	2310	0,171	13,504
N ₆ P ₆ K ₁₂	204,6	2301	0,171	13,473
Foliar				
N ₆ P ₆ K ₆	247,4	2620	0,189	13,848
N ₁₂ P ₆ K ₆	232,6	2481	0,177	13,972
N ₆ P ₁₂ K ₆	212,3	2423	0,175	13,860
N ₆ P ₆ K ₁₂	208,7	2390	0,174	13,693
Biofert - 3				
N ₆ P ₆ K ₁₂	213,6	2537	0,172	14,723
N ₁₂ P ₆ K ₆	214,3	2502	0,174	14,315
N ₆ P ₁₂ K ₆	216,9	2587	0,181	14,267
N ₆ P ₆ K ₁₂	211,5	2482	0,175	14,120

In order to establish the ratio between the growth weight and the yield from the vine, we have calculated the correlation coefficient (r). This coefficient according to (4,7) is more favourable when it had low values. Among the investigated variants the lowest value is established with Sal-12 leaf fertilisation, applied to N₆ P₆ K₁₂ basic fertilisation, followed by that of N₆ P₁₂ K₆.

The growth power of vine for the yield formation is effectively used with Biofert-3 leaf feeding and N₆ P₆ K₆ mineral fertilisation.

Table 2 shows the effect of the leaf fertilisers applied to different basic fertilisation on the content of nitrogen, phosphorus and potassium.

Tab.2. The effect of fertilisers on the content of nitrogen, phosphorus and potassium in the shoots, (%)

Uticaj vještačkih đubriva na sadržaj azota, fosfora i kalijuma u izdancima (%)

Element Variants Elementi Varijante	Basis fertilisation/Osnovno đubrenje			
	$N_6P_6K_{12}$	$N_{12}P_6K_6$	$N_6P_{12}K_6$	$N_6P_6K_{12}$
Sal - 12				
N	1,80	1,78	1,75	1,73
P	0,32	0,30	0,29	0,27
K	0,51	0,48	0,46	0,45
Foliar				
N	1,67	1,58	1,53	1,51
P	0,40	0,34	0,31	0,28
K	0,40	0,32	0,29	0,27
Biofert				
N	1,87	1,61	1,96	1,93
P	0,47	0,51	0,54	0,52
K	0,42	0,27	0,23	0,20

When Sal-12 and Foliar are applied to different levels of mineral fertilisation, the percentage of nitrogen in the shoots decreases; when Biofert-3 is used, this element decreases. The results were analogous regarding to the content of phosphorus in the shoots. The highest content of potassium in the three leaf fertilisers is detected in their application to $N_6P_6K_6$ mineral fertilisation norm. These results could give us the right to think that the nutritive substances from the leaf and mineral fertilisers are absorbed to different degrees. Regardless of the quantity of the introduced elements, the vine plant shows an eligibility to their absorption. It depends on the needs of the plant arisen during the different phases of vegetation.

Conclusions

The leaf fertilisers applied in combination with the basic mineral fertilisation serve as an extra source of nutritive substances necessary for the growth and fruitbearing of the vines' plants.

For the growth and yield formation, the vine uses a defined quantity from the basic nutritive elements, introduced through the leaves or taken from the soil, and it shows an obvious eligibility towards them.

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REZIME

Istraživanje je vršeno u periodu od 1990-1993. godine na lozama c.v. Pamid. Loze su sadene na rastojanju 3,4-1,2 m i postavljene na Mozeru. Na lozi je bilo po 42 okca. Uz uobičajenu proceduru zaštite vinograda, koji je uzgajan uz primjenu različitih količina osnovnog đubrenja sa azotom, fosforom i kalijumom, 02% rastvora SAL-12, takode uz primjenu Foliara i Biofert-3., vršena su četiri prskanja u intervalima od 14 dana u sljedećim perodima: pred cvjetanje, poslije cvjetanja, pri formiranju bobice i prije vegetacije.

Utvrđeno je da folijarna đubriva primjenjivana zajedno sa osnovnim dubrenjem služe kao dodatni izvor hranljivih materija koje su neophodne za rast i rodnoš loze.

Za svoj rast i prinos biljka koristi određenu količinu hranljivih elemenata i oni joj očigledno pogoduju.