INFLUENCE OF LEAF AND MINERAL FERTILIZATION ON QUANTITATIVE AND QUALITATIVE PRODUCTION OF GRAPE VINE IN THE COPOU IAŞI VINEYARD SPECIFICS CONDITIONS

INFLUENȚA FERTILIZĂRII FOLIARE ŞI MINERALE ASUPRA PRODUCȚIEI CANTITATIVE ŞI CALITATIVE A VIȚEI-DE-VIE ÎN CONDIȚIILE SPECIFICE PODGORIEI COPOU – IAŞI

NANEA CAMELIA, MIHAI C.V.
University of Agricultural Sciences and Veterinary Medicine Iasi

Abstract. *Reguardind the fact that grape prezents a good ecological malleability, beeing plant in the moast variate conditions of climate and soil, alongside the others tehnological links, fertilization it impose as necessary to obtaine a big and qualitative productions, as well as making longer the plantation time life. With a view to satisfy the nourishment demands of the grapevine, plant known as a big consumer of nutritive element, busides the mineral fertilization, an important role owns the leaf fertilization with positive implications over the grape production. In this paper it is followed the application eficiency of foliar fertilization on two agrofunds:* $N_0P_0K_0$ *and* $N_{50}P_{25}K_{90}$ *(ecological doses) with a view to obtain some quantitative and qualitative productions and that has a role to protect the environment. In this purpose they're were used seven leaf fertilizers, from which five chemical:* F_{221}*, Folvifer, Fertcomplex C, Kristalon green, Poly-Feed and two biological: Maxiroot şi Biostar, applied on these two agrofunds, that contributed toincreaset and improve the quality characteristics of the grape productions.*

Rezumat. *Având în vedere faptul că viţa de vie prezintă o mare plasticitate ecologică, fiind plantată în condiţii de climă şi sol dintre cele mai variate, alături de celelalte verigi tehnologice, fertilizarea se impune ca necesară în obţinerea unor producţii cantitative şi calitative, precum şi în vederea măririi duratei de viaţă a plantaţiei. În vederea satisfacerii cerinţelor de hrană a viţei-de-vie, plantă mare consumatoare de elemente nutritive, pe lângă fertilizarea minerală, un rol important îl deţine şi fertilizarea foliară cu implicaţii pozitive asupra producţiei de struguri. În această lucrare se urmăreşte eficienţa aplicării îngrăşămintelor foliare pe două agrofonduri:* $N_0P_0K_0$ *şi* $N_{50}P_{25}K_{90}$ *(doze ecologice) în vederea obţinerii unor producţii cantitative şi calitative şi cu rol în protejarea mediului ambiant. În acest scop s-au folosit şapte îngrăşăminte foliare, din care cinci chimice:* F_{221}*, Folvifer, Fertcomplex C, Kristalon verde, Poly-Feed şi două biologice: Maxiroot şi Biostar, aplicate pe cele două agrofonduri, care au contribuit la creşterea şi îmbunătăţirea însuşirilor de calitate a producţiei de struguri.*

The foliar fertilisation represents a modern and efficacious way to increase and improve the quantity and the quality of grape production. The foliar fertilizers contains suitable sources of macro- and microelements, as well as organic substances, that are actives both biological and physiological with a function of

hormones and vitamins, that determines the stimulation of photosynthesis at plants.

The fertilization on foliar way may provide important spores of harvest, without residually pollution the production and the sol, contributing the increase of the power and photosynthetic output of the foliar device.

MATERIAL AND METHODS

The studies were made at the farm Copou of S.C. VINIFRUCT S.A COPOU-IAŞI and followed the foliar fertilizers application influence on two agrofunds ($N_0P_0K_0$ and $N_{50}P_{25}K_{90}$) at grape vine about quantitative an qualitative production.

The experience organised in year 2006, is bifactorial, settled after the method of the randomized blocks.

Factor A – assortiment of extraradiculary fertilizer

a_1 – Folisof F_{221}
a_2 – Folvifer 3021
a_3 – Fertcomplex C
a_4 – Kristalon green 18:18:18 Plus
a_5 – Poly-Feed 19:19:19
a_6 – Maxiroot
a_7 – Biostar

Factor B – the doses of mineral fertilizer

b_0 – $N_0P_0K_0$ (unfertilized)
b_1 – $N_{50}P_{25}K_{90}$

As mineral fertilizer were used: complex fertilizer C 15:15:15, ammonium nitrate 34,5% and potassium sulphat 50%.

The mineral fertilization with complex fertilizer C 15:15:15 and the potassium soulphat has been realised in autumm and the ammonium nitrate has been administrated in spring, before the begining of vegetation, by spread and incorporation in the soil.

The biological matherial was represented by the race of grape Petit Sauvignon grafted on the portgraft Kober 5 BB.

The concentration recommended for leaf fertilizers are of 0,2-0,3 % for the organic ones (Maxiroot and Biostar) and content between 0,5-1 % for the chemical ones but the doses are of 2-3 l/ha for the organic leaf fertilizers and content between 7-8 l/ha fot the chemical ones.

The leaf fertilization was made in three rounds: the first fertilization -before blooming, the second after blooming and the third fertilization at ten days after the second one (2 june 2007, 23june 2007, respectively 3 july 2007).

In the time of the vegetation period were made several observation and measurments and finally was weiged the grape production and was determined the content of sugars and the total acidity of the must for each experimental variant.

RESULTS AND DISCUSSIONS

The values concerning the grape production obtained at the surface unit, the must of sugar and total acidity have as result, by eliminating the repetition, making the average on each variant (tables 1 and 2).

Comparative with the witness, the variants that have been foliar fertilized obtained increases of production included between 0,3-1,07 t/ha and the variants that were combined fertilized and that also look advantage of mineral agrofund, doubled the harvest increase. We can notice from figure 1 the most significant

Table 1

The production and the increase obtained at the race Sauvignon

Variant	Production *t/ha*	Production increase *kg/ha*	Production increase *%*
Mt	5.73	0	100
F1	6.80	1070	119
F2	6.68	950	117
F3	6.30	570	110
F4	6.50	770	113
F5	6.36	630	111
F6	6.52	790	114
F7	6.10	370	106
F1+ NPK	8.05	2320	140
F2+NPK	7.82	2090	136
F3+NPK	7.34	1610	128
F4+NPK	7.60	1870	133
F5+NPK	7.22	1490	126
F6+NPK	7.01	1280	122
F7+NPK	6.90	1070	119

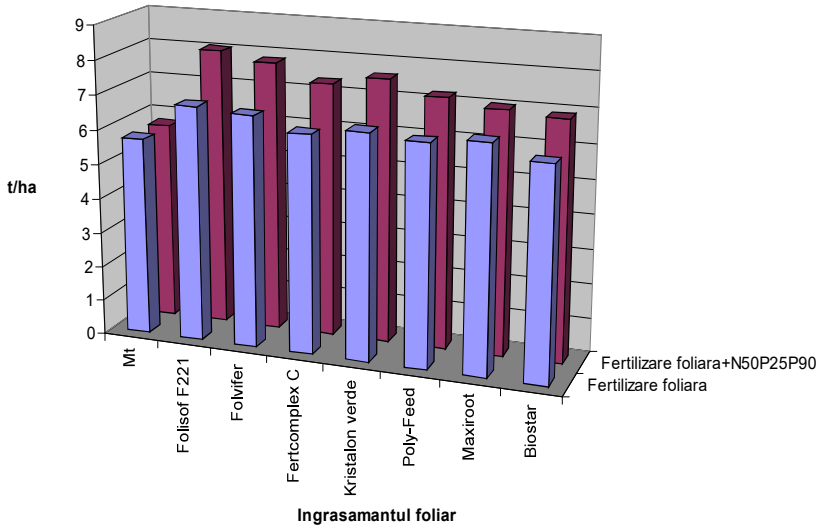

Fig. 1 – The influence of foliar and mineral fertilization over the grape vine production at the race Sauvignon

grapes production were obtained in the case of foliar fertilizers: Folisof $F_{221,}$ Folvifer and Kristalon green it benefit by radicular fertilization, respectively: 8,05 t/ha, 7,82 t/ha and 7,60 t/ha.

In the case of variants that benefited only by foliar fertilization, were obtained significant productions when it was used the assortments: Folisof $F_{221,}$ (6,8 t/ha,), Folvifer (6,68 t/ha), Maxiroot (6,52 t/ha) and Kristalon verde (6,5 t/ha).

The sugar quantities were acumulated differently inside the grapes depending on the foliar assortment applied, these having values between 170,5 - 190 g/l at the variants that were foliar fertilized and between 182,5 – 206 g/l at the variants that were combined fertilized.

The most significants acumulation of sugar were recorded at the variants combined fertilized with foliar fertilizers: Folvifer (206 g/l) Kristalon verde (205,5 g/l), Biostar (200,5 g/l), Poly-Feed (197,5 g/l).

Table 2

The sugar content and total acidity of the must at the race Sauvignon

Variant	The sugar content of must (*g/l*)	The probably alcoholical force of the must(*%vol.*)	Total acidity of the must *g/l* H_2SO_4
Mt	168.7	9.9	5.1
F1	174	10.2	4.7
F2	175	10.3	4.8
F3	190	11.2	4.9
F4	169.5	9.9	5.1
F5	193	11.3	4.4
F6	170.5	10	4.8
F7	181.5	10.7	5
F1+ NPK	186	10.9	5.5
F2+NPK	206	12.1	5.4
F3+NPK	193	11.3	4.7
F4+NPK	205.5	12.1	5.5
F5+NPK	197.5	11.6	5.4
F6+NPK	182.5	10.7	4.9
F7+NPK	200.5	11.7	4.9

From figure 2 we can notice that two of the foliar assortments and certain: Folvifer and Kristalon green favoured important acumulations of sugar (206 and 205,5 g/l) when they benefited also by radicular fertilizer comparative with the situation when these were applied on an unfertilized agrofund (175, 169,5 g/l).

The differences concerning the sugar quantities accumulated by the variants that were foliar and combined fertilized towards the witness variant are comprised between 0,8-37,3 g/l.

The probably alcoholical force gained increased once with the increase of the sugar content of the grapes. This was established with the help of the interpretation tables, based on the sugar content of the grapes and has values comprised between 9,9-12,1 %vol alcohol

The total acidity of the must, expresed in g/l H_2SO_4 is balanced, having values comprised between 4,4-5,5 g/l H_2SO_4.

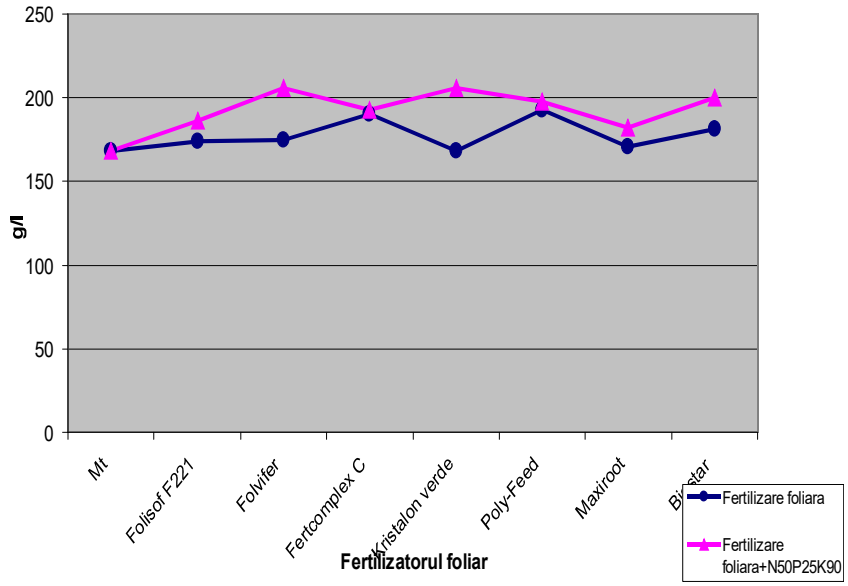

Fig. 2 – The influence of foliar and mineral fertilization over the content of sugar inside the grapes at the race Sauvignon

CONCLUSIONS

1. By applying foliar fertilizer on the two agrofunds (unfertilized and fertilized in ecological doses) was aimed the obtained of some superior quantitative and qualitative productions with the maintenance of an unpolluated environment.

2. From the obvious difference of the production increase obtained in the case of the variants that were combined fertilized comparative with these only foliar fertilized, we can take the importance of radicular fertilization in order to obtain quantitative productions.

3. The highest productions were obtained in case of the variants that were combined fertilized (mineral and foliar), these being comprised between 6,90-8,05

t grape/ha, comparative with the variants that were only foliar fertilized (6,1-6,8 t/ha).

4. The biggest increases of production were obtained at the variants that were fertilized with foliar fertilizers: Folisof F_{221}, Folvifer and green Kristalon on the agrofund mineral fertilized in ecological doses respectivly: 2,32 t/ha, 2,09 t/ha and 1,87 t/ha.

5. The sugar quantities acumulated were bigger at the variants fertilized with foliar fertilizers: Folvifer (206 g/l) Kristalon green (205,5 g/l), Biostar (200,5 g/l) and Poly-Feed (197,5 g/l) when it was also applied radicular fertilizers.

6. The differences concerning the sugar quantities acumulated by the variants that were foliar and combined fertilized towards the witness variant were comprised between 0,8-37,3 g/l.

7. The foliar and combined fertilization had a positive influence over the total acidity of the must, this remaining ballanced between 4,4-5,5 g/l H_2SO_4

REFERENCES

1. **Avarvarei I., Davidescu Velicica, Mocanu R., Goian M., Caramete C., Rusu M., 1997 –** *Agrochimie***.** Ed. Sitech, Craiova**.**
2. **Mustea M., 2004 –** *Viticultură***.** Ed. Ion Ionescu de la Brad, Iaşi.
3. **Rusu M., şi colab, 2005 –** *Tratat de agrochimie***.** Ed. Ceres, Bucureşti**.**
4. **Ţârdea C., Rotaru Liliana, 2003 -** *Ampelografie vol. II.* Ed. Ion Ionescu de la Brad, Iaşi.