

# INFLUENCE OF LEAF AND MINERAL FERTILIZATION ON GRAPE VINE PRODUCTION IN COPOU IAȘI VINEYARD SPECIFICS CONDITIONS

## INFLUENȚA FERTILIZĂRII FOLIARE ȘI MINERALE ASUPRA PRODUCȚIEI VIȚEI-DE-VIE ÎN CONDIȚIILE SPECIFICE PODGORIEI COPOU – IAȘI

NANEA CAMELIA

University of Agricultural Sciences and Medicine Veterinary Iași

**Abstract.** *With a view to satisfy the nourishment demands of the grapevine, plant known as a big consumer of nutritive element, besides the mineral fertilization, an important role owns the leaf fertilization with positive implications over the grape production. The present paper has in the view the effect of seven leaf fertilizer application, on two agrofunds:  $N_0P_0K_0$  and  $N_{50}P_{25}K_{90}$  (ecological doses), with a role in yield's quantitative increase. As a result of the investigations made is ascertain increases of the production, both variants leaf fertilized on an mineral unfertilized agrofund and especially at the variants combined fertilized (leaf and mineral), towards the control variant. From all these, the variants that have been fertilized with leaf assortments:  $F_{221}$  and Folvifer from the agrofund mineral fertilized have led to the obtaining of the most significant production increases.*

**Rezumat.** *Prin această lucrare se urmărește eficiența aplicării îngrășămintelor foliare pe două agrofonduri:  $N_0P_0K_0$  și  $N_{50}P_{25}K_{90}$  (doze ecologice) în vederea obținerii unor producții calitative și cu rol în protejarea mediului ambiant.*

*În acest scop s-au folosit șapte îngrășăminte foliare, din care cinci chimice:  $F_{221}$ , Folvifer, Fertcomplex C, Kristalon verde, Poly-Feed și două biologice: Maxiroot și Biostar, aplicate pe cele două agrofonduri, care au contribuit la îmbunătățirea însușirilor de calitate a producției de struguri.*

*Din cercetările efectuate s-a stabilit că variantele fertilizate foliar cu fertilizatorii: Maxiroot și Folvifer au acumulat cele mai mari cantități de zaharuri atât în cazul agrofondului nefertilizat cât și în cazul celui fertilizat în doze ecologice. De asemenea îngrășămintele foliare: Biostar și Folvifer au favorizat acumularea unor cantități mari de zaharuri și o aciditate echilibrată mai ales atunci când au avut ca suport și agrofondul mineral.*

For the obtaining of some constant quantitative and qualitative productions of grapes, year by year, it is necessary the fertilization of the grape vine. By the mineral fertilization, essential and indispensable, a determinative role for obtaining increases of production is own by the leaf fertilization that thanks to the surplus of fertilizing elements, especially of the microelements that creates optimal conditions for growth and development and struggle against the stress factors.

## MATERIAL AND METHOD

This experience has achieved in the viticole plantation as part of the Copou farm S.C. VINIFRUCT S.A. COPOU-IAȘI using seven assortments of leaf fertilizers (five chemicals and two organics) that have been applied on two agrofunds:  $N_0P_0K_0$  and  $N_{50}P_{25}K_{90}$ , following the application influence of those on the quantitative production of grapes.

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

Factor A – the assortment of extraradicular fertilizer

- $a_1$  – Folisof F<sub>221</sub>
- $a_2$  – 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

Factorul B – the dose of mineral fertilizer

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

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

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

The biological material used was represented by the race Petit Sauvignon grafted on the potgraft Kober 5BB. The leaf's limb was pale green coloured, twisted to the superior face. The grapes are middle, cylinder-conical, single or bewigged, although in beans. The bean is little, spherical, with thin peel, juicy pulp with specific flavour. It presents middle period of vegetation (165-167 days), middle vigour growth and good fertility, 60-70 % fertile offshoots. The growth is achieved at 2-3 weeks towards the race Chasselas doré (fourth epoch). The productions of grapes that are obtained are 6-8 t/ha. It accumulates sugars in quantities of 195-200 g/l and the total acidity of the must is by 4,5-5,5 g/l  $H_2SO_4$ .

The mineral fertilization with complex fertilizer C 15:15:15 and potassium sulphat has been done in autumn and the ammonium nitrate has been administrated in spring, before the beginning of vegetation, by spread and incorporation in the soil.

The leaf fertilizer has been done in three rounds: the first fertilization – before blooming, the second after blooming and the third fertilization at ten days after the second one (7 June 2006, 28 June 2006, respectively 8 July 2006).

In the time of the vegetation period have been made diverse observations and measurements and at the end was weighed the production of grapes for each experimental variant.

## RESULTS AND DISCUSSIONS

The manufacture of primary data obtained as a result of weighing the productions from each experimental variant, consisted in eliminating the repetitions, making the average on the variant and the report of data at the surface unit (table 1).

The productions of the grapes in the case of all experimental variants are superior to the control variant (5,9 t/ha), these ones being more arised at the variants mineral and leaf fertilized (contained between 7-8,25 t grapes/ha) comparative with those only leaf fertilized (6,14-6,86 t/ha) (figure 1).

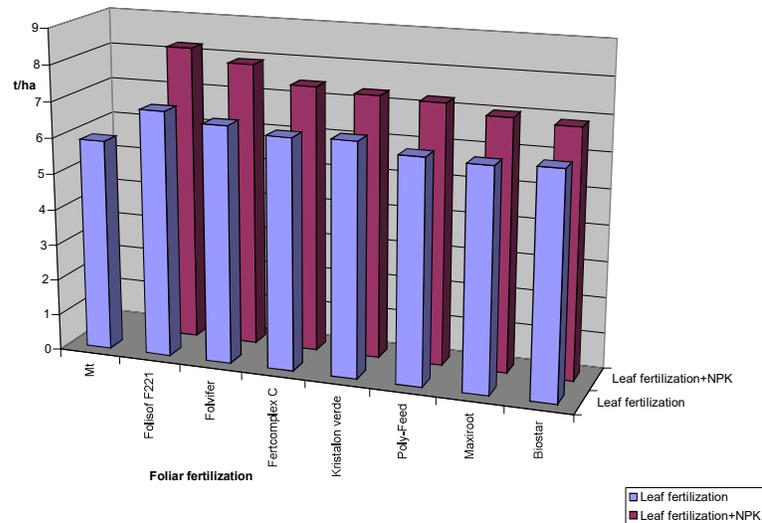
Analising the data from the table it is ascertain that the production increases are more significant in the case of the variants combined fertilized (radicularly and leaf) and in this case are contained between 0,99-2,35 t/ha. The most rised production increases have been obtained at the variants that were fertilized with leaf fertilizer Folisof F221 and Folvifer on the agrofund mineral fertilized in ecological doses, namely 2,35 t/ha and respectively 2,0 t/ha. Production increases have been also obtained in the case of only leaf fertilized variants, these ones being between 240-960 kg/ha towards the control variant. In the case of the agrofund unfertilized mineraly, the most significant increases of production were obtained at the variants that were foliar fertilized with: Folisof F221 and Folvifer (960 kg/ha and respectively 710 kg/ha).

From the significant difference of the efficiency of production obtained at the variants combined fertilized (mineral and leaf) towards the variants fertilized only foliar, results the importance of applications of the mineral fertilizer, unable to be replaced with the foliar fertilizer, in the view to obtain higher quantitative productions.

*Table 1*

**The production and the efficiency of production obtained at the race Sauvignon**

<b>Variant</b>	<b>Production t/ha</b>	<b>Efficiency of production kg/ha</b>	<b>Efficiency of production %</b>
<b>Mt</b>	5.9	0	100
<b>F1</b>	6.86	960	116.3
<b>F2</b>	6.61	710	112
<b>F3</b>	6.43	530	108.9
<b>F4</b>	6.48	580	109.8
<b>F5</b>	6.21	310	105.2
<b>F6</b>	6.14	240	104
<b>F7</b>	6.22	320	105.4
<b>F1+ NPK</b>	8.25	2350	139.8
<b>F2+NPK</b>	7.91	2001	134
<b>F3+NPK</b>	7.43	1530	125.9
<b>F4+NPK</b>	7.32	1420	124
<b>F5+NPK</b>	7.25	1350	122.8
<b>F6+NPK</b>	7	1100	118.6
<b>F7+NPK</b>	6.89	990	116.7



**Fig. 1** – Influence of leaf and mineral fertilization on production of grapevine at the race Sauvignon

## CONCLUSIONS

1. By foliar and mineral fertilization of the grapevine it can be observed a quantitative increase of the grapevine production.
2. The increases of production were more rised in the case of the variants fertilized combined (mineral and leaf) these being between 0.99-2.35 t grapes/ha comparative with the variants that were fertilized only foliar (0,24-0,96 t/ha).
3. The biggest increases of production were obtained at the variant that were fertilized foliar with Folisof F<sub>221</sub> and Folvifer on the agrofund mineral fertilized in ecological doses, respectively of 2,35 t/ha and 2 t/ha.
4. From the differences between the increases of production obtained at the variants combined fertilized towards the variants fertilized only foliar is noticing the importance of mineral fertilization, in the view to obtained some rised quantitative productions , that can't be replaced with the foliar fertilization.

## REFERENCES

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