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Influence of soil fertilization on leaf surface at the Burgund mare grape variety for wine, in conditions of teaching Station Timisoara

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Abstract Grapes are the most popular fruit to consumers of all ages. Grapes have both high energy levels, food and medicines. Research has been conducted in the years (2002 - 2004), and had as its object of study, the influence of organic and chemical fertilizers on yield and quality, the variety of grapes for white wine 'Burgund Mare' vineyard planting in the Didactic Station Timisoara. The purpose of this study was to track the influence of organic and chemical fertilizers on the leaf surface, resulting from the variety of their applications' Burgund Mare'.

Organic and chemical fertilizers are used in viticulture to supplement food needs and improving physical and biological characteristics of soil. These fertilizers in addition to enriching the soil nutrients and humus, they enhance the activity of useful microorganisms in the soil and stimulate more efficient use of fertilizers.

The category of organic fertilizers are: manure, semi-liquid slurry, green manure, compost. Green manure is in organic viticulture conditions safe and clean way to bring large quantities of soil organic matter. Nitrogen from legume plant is easily accessible and is rapidly fermented organic matter in soil, enriching it in humus.

Key words

leaf area, organic fertilizers, chemical fertilizers, vine variety, the vines

Fertilizers applied to live on fruit plantations have a positive impact on the overall vine vigor with favorable implications for the restoration of vegetative growth and productive capacity, to obtain high yields of grape quality. (7, 8).

Vines stay put for life plantations so that the hubs are bound to a limited space and nutritional consequences in depleting soil nutrients, the grape harvest, which removes elements from dry cutting operations in the green and parts to be added each year to the elements that make up the vine is the amount of nutrients extracted from soil, which must be renewed by fertilization (9,10,12).

Requirements to the main vine nutrient status varies according to soil fertility, rainfall, scion-rootstock, the quantity and quality of the grape harvest is done.

Biological Material and Method

The research was organized in the vineyard planting Didactic Station Timisoara, vine variety (aged 26) "Burgund Mare'.

Soil was placed on experience is a mold drafts, poor gleyed, with a humus content of 3.16%, moderately supplied with phosphorus, well supplied with potassium, groundwater wet, poorly decarbonated the storage medium leossoide fine, loamy clay medium / medium loamy clay.

The plantation was used to type planting distances between rows of 2,0 m and between 1,2 m logs in turn, ensuring a normal density of 4166 vines / ha (2, 6, 8). The experience lasted three years: 2002, 2003, 2004.

This experience was standing in the field after monofactorial randomized block method (7) with three repetitions and six variants: V_1 - unfertilized; V_2 - $N_{50}P_{50}K_{50}$, V_3 - $N_{75}P_{75}K_{75}$; V_4 - Lupin, V_5 - Lolium perennial, V_6 - Manure 50 t / ha. Manure was applied in autumn, once at the beginning of the experimental cycle. Phosphorus fertilizers, nitrogen and potassium were administered annually in autumn, after harvesting the grapes and were incorporated into the soil grower. (1, 2, 3, 4, 5, 6)

Sowing soil with lupine was in the spring (April). The amount of seed was 80 kg / ha and the distance between rows was 12,5 cm. Sowing was in bands with lupine in the intervals between the rows of vines. Being used as green manure that was incorporated into the soil to bind grain, the harvest is

higher and higher fertilizing value. Incorporation in soil was achieved with PCV_2 to 2,2. Green mass produced per hectare was 50,000 kg. Sowing was done in one lane on every side of the line.

Sowing soil in Lolium perennial each year was made after the spring plowing, the intervals between the rows of vines, in strips. The amount of seed used was 20 kg / ha. As it has been used as mulch mowing machine to clean pasture with MCP, which carried out mass shredding plant and leaving the soil surface.

Calculation of leaf area. To calculate leaf area were analyzed five hubs in each variant and repetition. From each block, there are leaves, then choose 10 medium-sized leaves. In order to determine with precision the greater leaf area, three methods were used (11).

The first method was to calculate the leaf area by weighing method. His elimination leaf stalks, then weighed in the balance analytical language, noting the weight. Then, with a preducea were removed 6 slices of the leaf blade. The six rings were weighed together. Then the surface was calculated according to the diameter disks preducelei. Each leaf surface was calculated with the equation:

$S = (G \times S) / g$

where:

S = leaf area (cm^2);

s = surface disks (cm^2);

G = leaf weight (g);

g = weight disks (g).

After calculating the area of 10 leaves was an average of the areas multiplied by the total number of leaves on the vine and leaf area was the hub value. To determine leaf area per hectare of vine leaf area is multiplied by the total number of existing vines per hectare.

A second method for determining the leaf area was the method of calculation based on the size of the leaf.

Results and Discussions

The thermal regime of the experimental years (2002 and 2004) was normal for the area studied. In terms of rainfall, experimental years were different. The rainy year was 2004, when there was a precipitation of 706,7 mm.

Vine vigor was assessed on the basis of the area benefits. Knowledge of leaf area has a special importance, because according to its size and its capacity of assimilation depends on production potential and crop quality

Leaf area in Burgund Mare variety depends on the level of fertilization.

Leaf area / vine of the Burgund Mare variety, in terms of 2002, is presented in Table 1.

Table 1

The foliar surface/vine in Burgund mare grape variety, in terms of weed control method, in the climate conditions of the year 2002

Variant	Leaf area (m^2/vine)	Relative value (%)	The difference from the control	Significance
V_1 – Unfertilized	1,57	100,00	Mt.	_
V_2 – N_{50} P_{50} K_{50}	2,40	152,86	0,83	XX
V_3 – N_{75} P_{75} K_{75}	2,87	182,41	1,29	XXX
V_4 – Lupin	2,27	144,27	0.69	X
V_5 – Lolium perene	2,25	143,00	0,67	X
V_6 – Manure 50 t/ha	2,51	159,53	0,93	XX

$DL_{5\%}$ = 0, 55; $DL_{1\%}$ = 0,79; $DL_{0,5\%}$ = 1,14;

The largest leaf area/vine were obtained from the variant fertilized with $N_{75}P_{75}K_{75}$ (2, 87 m^2/vine), the difference is very significant to the positive control. A considerable leaf area was obtained and the variants fertilized with manure (2, 51 m^2/butuc) and $N_{50}P_{50}K_{50}$ (2, 40 m^2/vine), distinct difference from being significantly positive control.

The lower leaf surface was recorded versions where lupine was applied (2, 27 m^2/vine) and Lolium perennial (2, 25m^2/vine) difference from control was significantly positive.

For 2004, the Burgundian varietals foliar area than is shown in Table 2.

Table 2

The foliar surface/vine in Burgund mare grape variety, in terms fertilization level, in the climate conditions of the year 2004

Variant	Leaf area (m^2/vine)	Relative value (%)	The difference from the control	Significance
V_1 – Unfertilized	2,25	100,00	Mt	_
V_2 – N_{50} P_{50} K_{50}	2,71	120,44	0,46	XXX
V_3 – N_{75} P_{75} K_{75}	2,88	128,00	0,63	XXX
V_4 – Lupin	2,63	116,88	0,38	XX
V_5 – Lolium perene	2,52	112,00	0,27	X
V_6 – Manure 50 t/ha	2,70	120,00	0,45	XXX

$DL_{5\%}$ = 0, 22; $DL_{1\%}$ = 0, 31; $DL_{0,5\%}$ = 0, 45;

Table 2 as a result of data, is apparent that the largest leaf area / vine were obtained variants fertilized with $N_{75}P_{75}K_{75}$ (2, 88 m^2/vine), $K_{50}N_{50}P_{50}$ (2, 71m^2/vine) and 50 t manure/ha (2, 70 m^2/vine), the differences are very significant to the positive control, while the lowest was recorded on the leaf surface variant Lolium perennial (2, 52m^2/vine) difference from control was significantly positive.

Table 3

The foliar surface/vine in Burgund mare grape variety, in terms fertilization level (Mean values 2002 and 2004)

Variant	Leaf area (m^2/vine)	Relative value (%)	The difference from the control	Significance
V_1 – Unfertilized	1,91	100,00	Mt.	_
V_2 – N_{50} P_{50} K_{50}	2,55	133,50	0,64	XX
V_3 – N_{75} P_{75} K_{75}	2,87	150,26	0,96	XXX
V_4 – Lupin	2,45	128,27	0,54	XX
V_5 – Lolium perene	2,38	124,60	0,47	X
V_6 – Manure 50 t/ha	2,60	136,12	0,69	XX

$DL_{5\%}$ = 0, 37; $DL_{1\%}$ = 0, 53; $DL_{0,5\%}$ = 0,78;

Mean leaf area / vine for large Burgundian variety, are presented in Table 3.

Table 3 as a result of data, can be concluded that the highest leaf area/vine, is derived from the variant fertilized with $N_{75}P_{75}K_{75}$ (2, 87 m^2/vine), the difference is very significant to the positive control.

Conclusions

1. It is noted that in the experimental 2002, the largest leaf area/vine was obtained on the variant fertilized with $N_{75}P_{75}K_{75}$ (2, 87 m^2/vine), the difference is very significant to the positive control. A considerable leaf area was obtained and the variants fertilized with manure (2, 51 m^2/vine) and $N_{50}P_{50}K_{50}$ (2, 40 m^2/vine) distinct difference from being significantly positive control. The lower leaf surface was recorded versions where lupine was applied (2, 27 m^2/vine) and Lolium perennial (2, 25 m^2/vine) difference from control was significantly positive.

2. From the results obtained in 2004, with regard to leaf area than the Burgundian varietals can be concluded that the highest leaf area/vine were recorded in variants fertilized with N_{75} P_{75} K_{75} (2, 88 m^2/vine), $K_{50}N_{50}P_{50}$ (2,71 m^2/vine) and manure 50 t/ha (2,70 m^2/vine), the differences are very significant to the positive control, and the smallest leaf area was recorded version with perennial Lolium (2,52 m^2/vine), significant difference from control was positive.

3. After calculating the average values of leaf area / vine for large Burgundian variety, it can be concluded that the largest leaf area / vine, is derived from the variant fertilized with $N_{75}P_{75}K_{75}$ (2, 87 m^2/vine), the shortfall Positive control is very significant.

4. Fertilizers applied to live on fruit plantations have a positive impact on the overall vine vigor with favorable implications for the restoration of vegetative growth and productive capacity, to obtain high yields of grape quality.

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