

VITICULTURAL PLANTATIONS AND THEIR ORGANIC FERTILIZATION

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Abstract

The most advantageous method of applying manure is that in deep ditches, of 35-45 cm, made at the middle of an interval of 2 m between rows, which partially replaces the subsoiling work. The application of organic matter uses different procedures, that is: by spreading, in holes, in ditches.

The application of organic matter by spreading presents the disadvantage that the nutritive elements are incorporated too close to the surface of the soil, in comparison with the optimal spreading region of the roots, fact that determines the partial capitalization of the fertilizers.

The application into holes of the organic fertilizers presents the disadvantage that these holes are made close to the vine log, region where the absorption is lower, because here there are found the clinging roots. As in the case of manure spreading and its application in holes, a disadvantage is that some weeds spring from the manure, which have to be removed by consequently manual weedings.

Key words: humus, soil erosion, manure, mulch, green fodder.

INTRODUCTION

The necessity of the organic fertilization of the viticultural plantations appears a consequence of the high productions given by these plantations and also as the result of the intensive consume of humus. Humus by its action causes the soil improvement, improves the water, air and heat regime, feeds the microflora which is useful in the soil, favours the crumb structure, improves the action of mineral fertilizers, favours the availability of nutritive substances for roots, diminishes the soil erosion, neutralizes some substances, such as pesticides. On the viticultural soils, there are some losses of humus, of about 2%; thus, it has to be constantly renewed by new shares of organic matter.

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MATERIAL AND METHOD

The viticultural plantations are generally placed on sloping plots, plots that are submitted to erosion, thus submitted to great losses of soil, which contains high quantities of humus, nitrogen, phosphorous and potassium. The necessity of organic fertilization of viticultural plantations

appears not only on the sloping plots but also on the other plots on the plateaus.

In the “biological viticulture” the usage of this type of fertilizer presents a special importance, because through it, the humus is maintained among some percents; it leads to the achievement of some abundant and healthy crops from an alimentary point of view.

Humus, by its action, causes the improvement of the soil by improving the air, water and heat regime; feeds the microflora useful in the soil; favors the crumb structure; improves the action of mineral fertilizers; favors the availability of nutritive substances for roots; diminishes the soil erosion; neutralizes some substances, such as pesticides.

The lack of humus causes negative effects such as: the silting of the soil after rain; it increases the danger of erosion on the sloping plots; the soil takes deficiently the water from rains; the nitrogen will be slightly leached; the soil becomes sensible to the repeated passage of tractors; the positive activity of microorganisms from soil decreases.

The organic matter that reaches the soil, such as: manure, leaves, straws after their decomposition and mineralization due to some microorganisms, are transformed into humic substances.

The sources of organic matter can belong to the plantation itself, that is: leaves, weeds, offshoot tips, herbs, minced vine shoots; but also some other added by man, such as manure, compost, green fodder, different materials used as mulch, etc.

The organic mass and nutritive substances of the leftovers from the vine culture, in comparison with those of the manure, is presented in table 1.

Table 1

The organic mass and nutritive substances of the leftovers from the vine culture, in comparison with those of the manure
(according to W. Hillebrand et co. 1995)

Specification	Dry mass (t/ha)	Nutritive substances in the dry mass (kg/ha)		
		N	P ₂ O ₅	K ₂ O
Wood	1.2-1.6	8.5-11.5	2.6-3.4	7.7-10.3
Husks of grapes	0.8-1	18-22	5-7	26-30
Offshoot tips	1.8-2.8	20-40	3-8	10-20
Sum	3.8-5.4	48-73	11-19	44-60
Manure 10t/ha	1.7-1.8	50	25	60

RESULTS AND DISCUSSIONS

The more favorable for the microorganisms like the air, water and heat regime is, the more intensive the humus consumption is.

The frequent tillage speeds up the degradation of the humus by facilitating the penetration of the oxygen, which stimulates the activity of microorganisms.

To the diminution of humus, it can also contribute the weed killing, the excessive stamping of the soil in any weather conditions and the lack of fertilization with manure composts.

There are some losses of humus of about 2% on the viticultural soils. As a consequence, it has constantly to be renewed by shares of organic matter. The humus content of the viticultural soils varies between 1.5-3%.

The application of organic matter uses different procedures, that is: by spreading, in holes, in ditches.

The application of organic matter by spreading presents the disadvantage that the nutritive elements are incorporated too close to the surface of the soil, in comparison with the optimal spreading region of the roots, fact that determines the partial capitalization of the fertilizers.

The application into holes of the organic fertilizers presents the disadvantage that these holes are made close to the vine log, region where the absorption is lower, because here there are found the clinging roots. As in the case of manure spreading and its application in holes, a disadvantage is that some weeds spring from the manure, which have to be removed by consequently manual weeding.

The application of organic fertilizers in ditches has two variants that is:

- a) in deep ditches of 25-35cm, one on each side of the row at 35-45cm.
- b) In deep ditches of 35-45cm, made in the middle of the interval.

Variant "a" has the disadvantage that sections too many roots and is too close to the vine log (35cm). The second variant, "b" has the advantage that re-introduces the manure at the level where most of the vine roots are found (45cm), and the roots are sectioned at a distance of 1m in comparison with the vine log causing less and easier injuries.

The opening of the ditches in the middle of the intervals is made with the viticultural cultivator plough, equipped with a body of a plough with 2 earth boards on the right and left. The work depth of the plough is of 45-50cm. The manure can be applied in the ditch both mechanically with the machine of manure spreading that has the two doors fixed, so that the

manure to fill the ditch, and manually with monoaxis trailers which can enter on an interval of 2m between rows.

The covering of the manure from the ditch is made mechanically by the help of viticultural cultivator plough, equipped with two bodies of the plough, which turn the furrow to the middle of the interval.

The weeds sprung from the manure are destroyed by a mechanical tillage with the cultivator, because they usually spring off in the central area of the interval.

The opening of these ditches in the middle of the interval replaces on a certain extent the periodical subsoil work; because of this, the fertilization will be made on the second interval, being finished after two years. The effect of organic fertilizers lasts 4 years, after which the fertilization is repeated.

CONCLUSIONS

By the fertilization with organic fertilizers, we have in view the increase of humus content in the soil and of its capacity to retain water, the improvement of structural stability, the facilitation of tillage, the stimulation of biological activity in the soil, and the supply of the most nutritive elements necessary for vine.

The most advantageous method of applying manure is that in deep ditches, of 35-45 cm, made at the middle of an interval of 2 m between rows, which partially replaces the subsoiling work.

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