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CURRENT PEDOLOGICAL STUDIES IN THE VINEYARD DRĂGĂŞANI IN RELATION TO THE EXISTING CLIMATE CONDITIONS

Bogdan Ion TRUŞCĂ, Sergiu-Ştefan GORJAN

Research and Development Station for Viticulture and Vinification Drăgășani,
Regele Ferdinand Blvd, no. 64, Zip Code: 245700, Drăgășani, Vâlcea, Romania

Corresponding author email: truscaionbogdan@yahoo.com

Abstract

In the year 2020, a soil study was carried out in the Drăgășani vineyard, following the natural fertility of the soil, humus, content in mobile forms of phosphorus and content in mobile forms of potassium, in order to behave some varieties of vines at the moment, in parallel to the influence of climatic conditions. The rational system of soil fertilization of vineyards is largely determined by the existing soil and climatic conditions in the area. Organic fertilizers, green manures, so necessary for heavy soils, will be promoted. Among the chemical fertilizers, slow-acting fertilizers will be preferred to reduce the risk of leaching and pollution. The soil samples collected were analyzed at the Agrochemistry Laboratory of IC-DVV Valea Călugărească, in accordance with the methods provided in the "Methodology for elaboration of agropedological studies" elaborated by IC-DVV Valea Călugărească.

Key words: *fertility, fertilizers, samples, soil, chemical analyzed.*

INTRODUCTION

In the Drăgăşani vineyard, soil studies were carried out in 2021, focusing on establishing the doses of organic and green fertilizers, in accordance with the type of soil currently existing in the vineyard, in order to behave some varieties of vines from qualitatively and quantitatively.

The soils of Dragăşani vineyard are generally clay-illuvial, occupying within the area 42.2% of the surface; followed by cambic soils with 23.5%, lithomorphic soils 20.8%, undeveloped soils 8.8%, hydromorphic soils 2.8% and atropic soils 1.9% (Condei et al., 1986).

In this context, a proper fertilization with phosphorus and potassium fertilizers will be required, so that the agrochemical values of the soil reach the optimal parameters (Davidescu D., Davidescu Felicia, 1992).

MATERIALS AND METHODS

The Drăgăşani vineyard is located between the parallels 44º30' - 44º55 'north latitude and the meridians 23º55'-24º15'east longitude (Condei, 1982).

The study was carried out in Dragasani vineyard in 2021, on the existing soils on top of the hills at an altitude of 290 m altitudine.

There were presented 3 soil samples, numbered with numbers from 1 (CF), 2 (SB) and 3 (M). The soil samples were collected from the studied field at depths of 0-30 cm and 30-60 cm, the samples being coded according to their own coding system as follows: 83.1, 83.2, 84.1, 84.2, 85.1 and 85.2.

The soil samples collected were analyzed at the Agrochemistry Laboratory of IC-DVV Valea Călugărească, in accordance with the methods provided in the "Methodology for elaboration of agropedological studies" elaborated by ICDVV.

The mobile phosphorus contents, the mobile potassium contents, the nitric nitrogen content, the humus content, the total calcium content were analyzed in order to fertilize according to the fertilization of the soil in the vineyards.

RESULTS AND DISCUSSIONS

The results of these mobile contents are analyzed and studied in Tables 1-10, the interpretation limits indicating average indices of soil supply with mineral fertilizers.

Table 1. Mobile phosphorus content

Test number	Test number register	Depth cm	P ppm	Supply level
0	1.	2.	3.	4.
1	83.1	0 - 30	72	middle
	83.2	30-60	64	middle
2	84.1	0 - 30	68	middle
	84.2	30-60	56	middle
3	85.1	0 - 30	64	middle
	85.2	30-60	48	middle

Table 2. Mobile phosphorus content

Limit values (phosphorus ppm)	Appreciation of the degree of supply
< 8.0	very weak
8.1-18.0	weak
18.1-36.0 37.0-72.0	middle
72.1-108.0 108.1-144.0	good
> 144.1	very good

The content in mobile forms of phosphorus is medium, the values oscillating between 64-72 ppm in the horizon 0-30 cm and medium with values between 48-64 ppm in the horizon 30-60 cm (the optimal level for the cultivation of quality varieties is 108-144 ppm).

Table 3. Mobile potassium content

Test number	Test number register	Depth cm	K ppm	Supply level
0.	1.	2.	3.	4.
1	83.1	0 - 30	160	good
	83.2	30-60	144	good
2	84.1	0 - 30	140	good
	84.2	30-60	124	middle
3	85.1	0 - 30	152	good
	85.2	30-60	124	middle

Table 4. Mobile potassium content

Limit values (potassium ppm)	Appreciation of the degree of supply
< 66.0	weak
66.1-132.0	middle
132.1-200.0	good
200.1-265.0 265.1-400.0	very good

The content in mobile potassium varies from medium to good, the values oscillating between 140-160 ppm in the horizon 0-30 cm and between 124-144 ppm in the horizon 30-60 cm (the optimal values for the cultivation of quality varieties are between 200-265 ppm).

Table 5. Nitric nitrogen content

Test number	Test number register	Depth cm	Nitric nitrogen ppm	Supply level
0.	1.	2.	3.	4.
1	83.1	0 - 30	1.07	weak
	83.2	30-60	0.91	very weak
2	84.1	0 - 30	1.00	weak
	84.2	30-60	0.86	very weak
3	85.1	0 - 30	1.05	weak
	85.2	30-60	0.90	very weak

Table 6. Nitric nitrogen content

Limit values (Nitric nitrogen ppm)	Appreciation of the degree of supply
< 0.5	extremely small
0.6-1.0	very small
1.1-2.0	small
2.1-3.0	middle
3.1-6.0	big
6.1-25.0	very big
> 25.1	extremely large

Regarding the mobile forms of nitrogen (ammoniacal-NH_4 and nitric-NO_3) it is found that they register low values. However, the content of mobile nitrogen forms does not allow a correct interpretation of the soil supply of nitrogen, because it is very fluctuating during the vegetation period of the vine, depending on the thermal and pluviometric regime, the mobile forms of nitrogen can be easily washed on soil profile in conditions of heavy rainfall.

Table 7. Humus content

Test number	Test number register	Depth cm	Humus %	Supply level
0.	1.	2.	3.	4.
1	83.1	0 - 30	1.83	middle
	83.2	30-60	1.72	middle
2	84.1	0 - 30	1.78	middle
	84.2	30-60	1.66	middle
3	85.1	0 - 30	1.89	middle
	85.2	30-60	1.72	middle

Table 8. Humus content

Limit values (humus %)	Appreciation of the degree of supply
< 1.0	weak
1.1-2.0	middle
2.1-3.0 3.1-4.0	good
4.1-5.0 5.1-8.0	very good

The humus content is medium, the values oscillating between 1.78-1.89% in the horizon 0-30 cm and between 1.66-1.72% in the horizon 30-60 cm.

Table 9. Total calcium content

Test number	Test number register	Depth cm	Total calcium %	Appreciation
0	1.	2.	3.	4.
1	83.1	0 - 30	3.27	middle
	83.2	30-60	3.37	middle
2	84.1	0 - 30	2.73	middle
	84.2	30-60	3.55	middle
3	85.1	0 - 30	2.68	middle
	85.2	30-60	3.18	middle

Table 10. Total calcium content

Limit values	Appreciation of the presence of total calcium	Limits
OO	it's not necessary	absent
MC	small	< 1
MO	middle	2-4 5-8 9-12
MR	big	13-15 16-20 21-25
FR	very large (marly)	26-40
ER	extremely high (marl-limestone)	> 40

The total calcium content is medium, registering values that oscillate between 2.68 and 3.27% in the horizon 0-30 cm and between 3.18 and 3.55%.
(***Limits of according to instructions developed by ICDPA, 1976).
(*** ICDVV- Methodology for elaboration of agropedological studies, 2021).

CONCLUSIONS

From the obtained data it results that the studied land has an average natural fertility, with an “average” supply in humus, an “average” content in mobile forms of phosphorus and an “average to good” content in mobile forms of potassium.
From this point of view, a proper fertilization with phosphorus and potassium fertilizers is required, so that the agrochemical values of the soil reach the optimal parameters.

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