THE RESEARCH ON SUPPLY OF NITROGEN, PHOSPHORUS AND POTASSIUM IN THE CHERNOZEM CAMBIC PLANTATION RESORT TIMISOARA TEACHING UNDER THE INFLUENCE OF FERTILIZATION

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***Abstract**: The research was carried out plantation Didactic Station Timisoara, during the three years, respectively 2008, 2009 and 2010. Fertilizers applied were both nitrogen fertilizers, phosphorus and potassium in different doses and organic fertilizers, manure respectively. Manure was applied in quantities of 30 t/ha in autumn 2007. The results showed different contents of nitrogen, phosphorus and potassium, depending on the vegetation of trees, respectively in April, the content is higher in comparison with September, this is due to consumption of tree nutrients during the growing consumption of otherwise normal, because in this period, the trees need fertilizer application in order to take advantage. Determination of Total Nitrogen - Kjeldahl method was (mineralization of soil is made by boiling with concentrated sulfuric acid in the presence of catalyst). Mobile Phosphorus - was determined by the Egner-Domingo-Rhiem a spectrophotometer UV - VIS. Potassium assimilated - was extracted in ammonium acetate and lactate was determined with atomic absorption spectrophotometer. In this direction have been made both their research and by other researchers in the field, but concrete results in this sense can be seen only after a greater number of years because the amount of nitrogen, phosphorus and potassium in soil amended continuously due to consumption by the trees. In Romania, research in this field as complex, are limited, the main cause is the relatively high cost of fertilizers, and lack of financial resources to continue research and present the results obtained. The work is original, both in terms of information it provides those interested in fertility status of soils occupied by trees, and because it offers both practical solutions in soil conditions and the orchards. Following these investigations, it may occur through the application of mineral and organic fertilizers in appropriate doses, without involving large expenditure, to pollute the soil or fertilize with amounts too low which would reduce production and to obtain low-quality fruit, which would remain sufficiently so high crop loss and financial resources. The book has great practical importance, because without new and needed both of fertility status of land occupied by trees and in the achievement of steady production and good quality.*

***Key words*: soil, fertilizers, total nitrogen, phosphorus dynamics, potassium assimilated**

INTRODUCTION

The research was conducted in fruit-growing plantations of Teaching and Experimental Station, University of Agricultural Sciences and Veterinary Medicine of Banat, Timisoara, during the three years ie 2008, 2009 and 2010.

Of the fertilizers were applied as mineral fertilizer, nitrogen, phosphorus and potassium fertilizer and organic manure in doses that vary by option.

Fruit-growing plantation is located in the northern town of Timisoara and has an area of 15.43 ha, of which 7 ha is occupied by trees, 7 ha of vines, and the remaining 1.43 ha is occupied by roads Access and buildings. Although it has a didactic character, planting can be considered cost-effective because it is located near Timisoara, thus providing possibility that any product can be opened immediately in the market with lower costs.

This plantation is well placed taking into account both the industry and research

issues, and the insurance product sales material and marketing.

MATERIAL AND METHODS

Determination of Total Nitrogen - Kjeldahl method was (mineralization of soil is made by boiling with concentrated sulfuric acid in the presence of catalyst); Mobile Phosphorus - was determined by the Egner-Domingo-Rhiem a spectrophotometer UV – VIS.

Potassium assimilated - was extracted in ammonium acetate and lactate was determined with atomic absorption spectrophotometer.

RESULTS AND DISCUSSIONS

1. Total soil nitrogen dynamics

The super-system, the total accumulated amounts of nitrogen are lower than the intensive system as may be found in the data presented in table 1.

Table 1

Dynamic of total nitrogen in the soil, in the superintensive system (%)

Year	Months	Factor B						Mean %	Difference %
		b_0 - $N_0P_0K_0$	b_1 - $N_{70}P_{30}K_0$	b_2 - $N_{100}P_{50}K_{20}$	b_3 - $N_{150}P_{100}K_{50}$	b_4 - **g.g.**	b_5 - g.g.+ $N_{50}P_{30}K_{10}$		
2008	*april*	0,280	0,316	0,388	0,420	0,407	0,418	0,390	0,11
	september	0,274	0,308	0,370	0,410	0,390	0,402	0,376	0,10
2009	*april*	0,254	0,302	0,370	0,395	0,390	0,401	0,371	0,11
	september	0,248	0,290	0,351	0,380	0,375	0,392	0,358	0,11
2010	*april*	0,246	0,292	0,340	0,359	0,350	0,360	0,340	0,09
	september	0,230	0,290	0,331	0,348	0,342	0,351	0,332	0,10

In 2008, the total nitrogen content in soil ranges from 0.316% to 0.418% in version b_1 and b_5, as compared to 0.280% has version control, in late April and between 0.308% and 0.402% in early September, the same variants.

In 2009, the total nitrogen content in soil ranges from 0.302 to 0.401% in b_1 and b_3, compared to 0.254% as it has version control, in late April and between 0.290% and 0.392% in early September, the same variants.

In 2010, the total nitrogen content in soil ranges from 0.292% to 0.360% in version b_1 and b_5, as compared to 0.246% has version control, in late April and between 0.290% and 0.351% in early September, the same versions, with an average of 0.340% in April and 0.332% in September.

2. Mobile in soil phosphorus dynamics

The super-system, the fertilized variants, phosphorus was found in amounts greater than the control group but not in all cases, as seen from the data presented in Table 2.

In 2008, mobile soil P content varies between 18.42 and 24.35 ppm ppm b_1, b_4, compared to 18.30 ppm as it has version control, in late April and between 18.38 and 24.21 ppm, in early September.

In 2009, digestible P content in soil ranges from 18.48 ppm to 24.50 ppm in b_1 and b_3, to 18.18 ppm as it has version control, in late April and between 18.33 and 24.08 ppm, in early September, the same variants.

In 2010, mobile P content in soil ranges between 18.08 and 19.70 ppm ppm b_1, b_5, compared to 18.00 ppm as it has version control, in late April and between 18.02 and 19.57 ppm, in early September, the same variants.

Table 2.

Dynamic of assimilate phosphorusin the soil, in the superintensive system (ppm)

Year	Months	Factor B						Mean ppm	Difference %
		$N_0P_0K_0$	$N_{70}P_{30}K_0$	$N_{100}P_{50}K_{20}$	$N_{150}P_{100}K_{50}$	g.g.	g.g. + $N_{50}P_{30}K_{10}$		
2008	*april*	18,30	18,42	18,65	24,35	23,90	24,30	21,92	3,62
	september	18,20	18,38	18,85	24,20	23,76	24,09	21,86	3,65
2009	*april*	18,18	18,48	18,72	24,50	23,76	24,09	21,91	3,73
	september	18,04	18,33	18,90	24,08	23,60	23,92	21,76	7,72
2010	*april*	18,00	18,08	18,30	19,52	19,34	19,70	18,99	0,99
	september	17,92	18,02	18,24	19,46	19,20	19,57	18,90	0,98

3. Assimilable potassium in soil dynamics

A situation similar to that seen in the intensive culture system is also found in culture super-system but soil K values are lower. At variants fertilized with potassium, potassium content in soil is higher than in the unfertilized, but this element increases and decreases in these versions follow the same laws as precedents, data are presented in Table 3.

Table 3.

Dynamic of assimilate potassium the soil, in the superintensive system (ppm)

Year	Months	Factor B						Mean ppm	Difference ppm
		$N_0P_0K_0$	$N_{70}P_{30}K_0$	$N_{100}P_{50}K_{20}$	$N_{150}P_{100}K_{50}$	g.g.	g.g. + $N_{50}P_{30}K_{10}$		
2008	*april*	120,5	126,6	132,6	161,3	144,6	185,3	150,1	29,6
	september	112,4	152,6	152,1	160,3	174,5	186,1	165,1	52,7
2009	*april*	129,8	140,7	140,5	189,8	150,5	209,8	166,3	36,5
	september	135,9	151,1	145,1	208,2	180,6	221,1	181,2	45,3
2010	*april*	127,0	127,1	146,3	172,3	139,0	180,3	153,0	26,0
	september	120,6	122,0	140,4	168,6	132,4	176,0	147,9	27,3

In 2008, the soil content of assimilable K varies between 126.6 ppm and 185.3 ppm b_1, b_5 in late April and between 152.6 ppm and 186.1 ppm in early September, averaging 150.1 April ppm, 160.1 ppm respectively in September.

In 2009, K content in soil ranges from assimilated 140.7 ppm and 209.8 ppm b_1, b_5, compared to 129.8 ppm as it has version control, in late April and between 151.1 and 221.1 ppm in early September, the same variations, an average of 166.3 ppm, 181.2 ppm respectively.

In 2010, the soil content of assimilable K varies between 127.1 ppm and 180.3 ppm b_1, b_5 in late April and between 122.0 ppm and 176.0 ppm in early September, averaging 153.0 ppm in April, 147.9 ppm respectively in September. It can be seen as an increase in K content in soil assimilable, if fertilized with K variants and those with manure.

CONCLUSIONS

Following research in plantation Timisoara Didactic Station in 2008-2010, were separated as follows:

1. Because fruit trees occupying the land long periods and annual production is exported through a large amount of material synthesized so that the kingdom need fertilization occurs;

2. Fertilizers can be applied extraroot root or on aerial parts of the plant. Fertilization in turn can make the entire area or only in the root zone;

3. Soil fertility in the experimental field has a middle. To increase the potential for the necessary measures of fertility and agrochemical agrotechnical are expected to improve its physical and chemical properties;

4. Total nitrogen content ranges from 0.300% in September 2010 and 0.442% b_0 version in 2008 in April in the intensive variant b_5 and between 0.230% in 2010 version b_0 intensively and 0.418% in 2008 version b_5, the super-system. Total nitrogen content limits found in medium to large, intensively, namely super-small system, this is due to higher density of trees per hectare in the super-system, from the intensive system, and therefore the need for total nitrogen trees is higher.

5. Mobile phosphorus content ranges from 19.92 ppm in September 2008 and 27.12 ppm in April 2008, the intensive and between 17.92 and 24.30 ppm in September 2010 ppm in April 2008 in super-system. It can thus be said that middle ground is supplied with this item.

6. Assimilable potassium content is 121.5 ppm in April 2008, and 288.0 ppm b_0 version in September 2008, the version b_4 in intensive culture system and between 112.4 ppm in September 2008 and b_0 221.1 ppm in September 2009 with super-crop system. The soil is low to medium supplied with this item, except the variant b_5, which is well stocked.

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