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STUDY OF THE RELATIONSHIP BACTERIZATION-SOWING PERIOD ON YIELD AND QUALITY OF PEA AND SOYBEAN IN ALMĂJ DEPRESSION

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ABSTRACT – Study of the relationship bacterization-sowing period on yield and quality of pea and soybean in Almăj Depression

The research work was carried out on a terra rossa (preluvisol), moderately eroded with the pH value of 6.00. The humus content is moderate in the first 30 cm (2.33 to 2.12%), the potassium content has high values (207.5 ppm in the Ap horizon), the mobile phosphorus content is high (63.3 to 117.3 ppm) and the nitrogen index has medium values. Trifactorial experiments were carried out in the pea culture, in which the factor A was represented by the cultivated variety (Dora, Montana and Monique), the factor B represents the influence of the bacterization with non bacterized and the factor C, the influence of the sowing time. The results varied within the investigated period between 791 kg/ha and 1603 kg/ha. For the soybean culture the experiments were organized trifactorially, the investigated factors were: factor A – the cultivated variety (Felix Neoplant and Venus), factor B - bacterizarea (nebacterizat and bacterizat) and factor C sowing period with two graduations. The yield of the researched area ranged from 1366 kg/ha to 2098 kg/ha. The researches took place in the Almaj Depression considered to be an area less favourable for the two cultures, the only leguminous cultivated being the beans. The practical implications of the research work were to create opportunities to ensure the protein needs for human and animal food consumption and to improve the crop structure and to ensure efficient rotations. The project is financed by CNCSIS and is entitled "Contributions to the development of non-poluting technologies, economically efficient for peas, soybeans and lentils, adapted to the South-Western part of the country, with effects on the reduction of protein deficiency in food".

Keywords: bacterization, sowing period, pea, soybean

INTRODUCTION

Legumes is a very important group of crops due to high protein content of grain, and some of them (peanuts and soybean) and oil content (NIŢĂ, 2004).

Legumes have a special importance because agro-phyto-technical soil nitrogen enrichment as a result of its fixation from the atmosphere through plants symbiosis with bacteria of the genus Rhizobium. Researches in the last decades have shown that in the nodule from the roots of leguminous plants nitrogen accumulates through the activity of the bacteria are living in these nodules. Symbiosis is dependent on endogenous and exogenous factors that ensure the function and adjustment of fixed nitrogen (NIŢĂ, 2006).

It is estimated that by using this process saves about 70% of the fertilizer applied to culture and has a beneficial effect for culture that is in turn leaving a significant amount of soil nitrogen (NIŢĂ, 2004; ŞUVEŢI, 1999).

MATERIAL AND METHOD

Experience within the village Bozovici was located on a vertic batistagnic preluvosoil soil type, moderately eroded by water, very deep, with inflatable clay, very fine texture, medium loamy clay/salty clay.

Texture is not differentiated on profile being fine throughout the profile, Figure 1.

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Soil reaction is slightly acidic throughout the profile with pH values between 6.00 and 6.86.
Humus is in moderate quantities in the first 50 cm (2.33 to 2.12%) and smaller quantities in the lower horizons (1.53%).

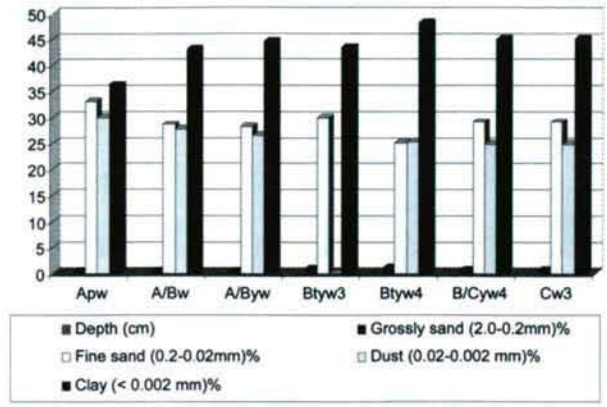

Figure 1: Soil texture

Mobile potassium content is higher with values ranging between 207.5 ppm and 182.6 ppm in the Ap horizon Btyw horizon. Mobile phosphorus content is higher with values ranging between 63.3 ppm and 117.3 ppm, and nitrogen index value is medium.
For the two cultures have been organized experiences trifactoriale in which A-factor was the cultivated variety (the peas Dora, Montana and Monique, soy Felix Neoplata and Venera), factor B - (no bacterization and bacterization) and factor C from sowing period with two graduations (Time I-March 27, the Time II - April 7).

RESULTS AND DISCUSSIONS

Table 1 and the Figure 2 show the results of pea harvest in Almăj Depression. From the three varieties Montana was the first which exceeded Dora with 456 kg/ha, with a very significant difference. The results for the variety Monique are similar to those of the variety Montana the difference between the two varieties being less than 100 kg/ha. With reference to the influence of bacterization the results show the effectiveness of such technological measures, the shortfall of no bacterization being about 261 kg/ha. The time of sowing has proved important in this area. So delaying sowing from Time I to Time II recorded a loss of 93 kg/ha, without statistical significance.

Table 1: The results obtained in pea harvest at Bozovici

Factor A	Factor B	Factor C		Factor A average			
		C1-Time I	C2- Time II	Yield kg/ha	%	Difference kg/ha	Significance
A_1 Dora	B_1.no bacterization	855	791	969	100	-	Mt.
	B_2. bacterization	1125	1106				
A_2 Montana	B_1.no bacterization	1366	1232	1425	147	456	XXX
	B_2. bacterization	1603	1499				
A_3 Monique	B_1.no bacterization	1266	1195	1350	139	381	XXX
	B_2. bacterization	1552	1387				

DL5% = 181 kg/ha DL1% = 239 kg/ha DL 0,1% = 351 kg/ha

Factor C average

Specification	C1- Time I	C2- Time II
Yield kg/ha	1295	1202
%	100	92
Difference kg/ha	-	-93
Significance	Mt.	-

DL5% = 192 kg/ha DL1% = 247 kg/ha DL 0,1% = 362 kg/ha

Factor B average

Specification	B_1.no bacterization	B_2. bacterization
Yield kg/ha	1118	1379.
%	100	123
Difference kg/ha	-	261
Significance	Mt	XX

DL5% = 140 kg/ha DL1% = 208 kg/ha DL 0,1% = 259 kg/ha

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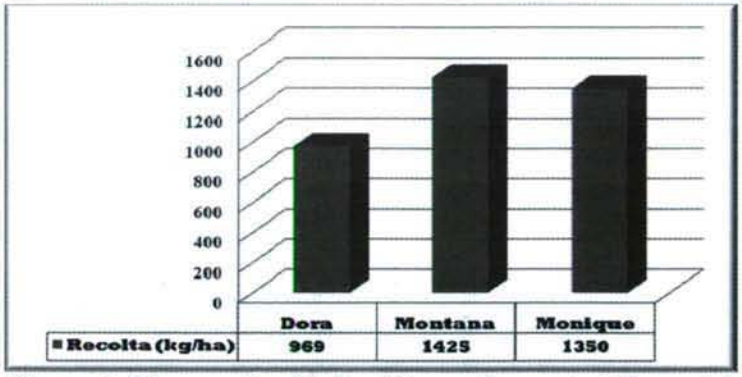

Figure 2: The results obtained in pea harvest at Bozovici

The results obtained from soybeans, in the Almăj Depression are shown in Table 2 and Figure 3. Even in a year with less favorable weather conditions this crop shows that this area meets the conditions for the extension of soybeans, the harvest being over 1700 kg/ha for Neoplata variety, and even exceeding 2000 kg/ha at Venera variety, sowing seed in the first period with bacterization.

Table 2: The results obtained in soybean harvest at Bozovici

Factor A	Factor B	Factor C		Factor A average			
		C1- Time I	C2- Time II	Yield kg/ha	%	Difference kg/ha	Significance
A_1 Felix	B_1.no bacterization	1530	1366	1550	100	-	Mt.
	B_2. bacterization	1676	1626				
A_2 Neoplata	B_1.no bacterization	1720	1551	1746	113	196	X
	B_2. bacterization	1955	1757				
A_3 Venera	B_1.no bacterization	1813	1705	1884	125	334	XXX
	B_2. bacterization	2098	1919				

DL5% = 181 kg/ha DL1% = 239 kg/ha DL 0,1% = 351 kg/ha

Factor C average

Specification	C1- Time I	C2- Time II
Yield kg/ha	1802	1654
%	100	92
Difference kg/ha	-	-148
Significance	Mt.	-

DL5% = 192 kg/ha DL1% = 247 kg/ha DL 0,1% = 362 kg/ha

Factor B average

Specification	B_1.no bacterization	B_2. bacterization
Yield kg/ha	1614	1839
%	100	114
Difference kg/ha	-	225
Significance	Mt.	XX

DL5% = 140 kg/ha DL1% = 208 kg/ha DL 0,1% = 259 kg/ha

From the three varieties, Venera proved to be the best, followed by Neoplata. Bacterization of the seed led to the increasing of yield by 14%, resulting in a very significant difference of 225 kg/ha. Planting dates in the specified experimental conditions resulted in no significant differences in harvest.

These conclusions are required to be verified in future years, because of the climatic irregularities of 2010.

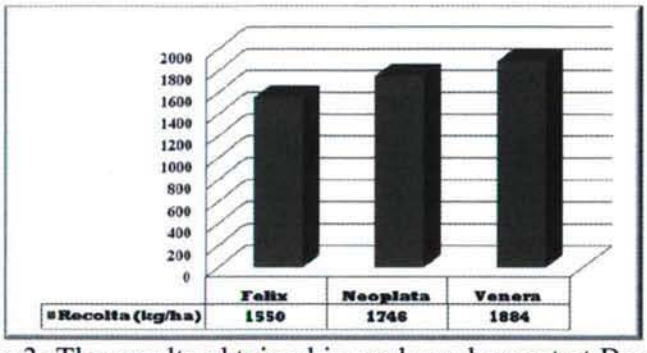

Figure 3: The results obtained in soybean harvest at Bozovici

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CONCLUSIONS

1. In Almăj Depression among pea varieties studied was imposed variety Montana, which averaged over other factors investigated, the yield exceeded with 82% Dora the control variety.
2. With reference to bacterization the results show the effectiveness of such technological measures, the shortfall of no bacterization being about 261 kg/ha.
3. Among the soybean varieties studied, it was Venera whose yields were 25% greater than variety Felix, returning a difference of over 334kg/ha.
4. Bacterization of seed, averaged over the three varieties led to an increase of yield by 25%.

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