THE BEHAVIOUR OF SOME VARIETIES OF PEA, SOYBEAN AND LENTILS CONCERNING THE RELATIONSHIP BACTERIYATION-SOWING PERIOD ON THE YIELD AND QUALITY IN TIMIŞ PLAIN

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Abstract: *The experiment was carried out within the Didactic Station of USAMVB Timisoara on a cambic chernozem slightly gleyied, slightly hyposalic and moderately hyposalty under 100 cm, slightly decarbonized on loess moderate fine deposits medium clay loam / medium clay loam. According to its composition, the soil falls within the class texture "fine textured", subclass medium clay loam, undifferentiated in profile. In the first part of the profile the soil reaction is neutral (pH 7.03-7.18) and in the second half the reaction is slightly alkaline (pH 8.25-8.49).The experiences for pea and soybean crops were three factorial in both areas, where factor A - was represented by the cultivated variety, (for pea - Dorsa, Montana and Monique; for soy - Felix, Neoplata and Venera), factor B - (nonbacterized and bacterize) and factor C - sowing time with two graduations. For the lentils culture the experiments were three factorial, where factor A – was represented by the distance between rows, with the graduations: A1- 6.25 cm; A2 -12,5 cm, A3 -25 cm and 12.5 cm, factor B - sowing period with the graduations: b1 – 3- 4 0C and b2 7-8 0C and factor C - sowing density with, C1-100 g.g / m^2, C2-200 g.g. / m^2, C3-300 g.g. /m^2 C4-400 m2 g.g. / m^2. From the tested varieties of pea, Monique noted. For this variety, on average to the other experimental factors the obtained yield was above 1,700 kg /ha. The results obtained in the soybean crop from Timiş Plain highlighted the varieties Neoplata and Venera, with superior yields that Felix variety by 24% with a yield difference of 500 kg / ha. Neoplata variety has a yield score of 2361 kg / ha, higher than control by 11%. For lentils culture in Timis Plain the optimal density was about 200 g.g / m^2.*

Key words: *bacterization, sowing period, variety*

INTRODUCTION

Legume seed inoculation with Rizobium bacteria strains specific for each species and variety, aims to stimulate the formation of a large number of nodule on the root and thereby the stimulation of nitrogen fixation process. Research in recent decades has shown that the aggression of each suseres has a specific concerning each variety. It is known that by using this method we can save about 70% of applied fertilizer that culture need and has a benefic effect on the culture that follow in rotation wich leaves a large amount of nitrogen in soil.

MATERIAL AND METHODS

The experiment was carried out within the Didactic Station of USAMVB Timisoara. The soil type is cambic chernozem slightly gleyied, slightly hyposalic and moderately hyposalty under 100 cm, slightly decarbonized on loess moderate fine deposits medium clay loam / medium clay loam. According to its composition, the soil falls within the class texture "fine textured", subclass medium clay loam, undifferentiated in profile.

For the pea culture the experiments were three factorial with three replications and the folowing factors graduations: Factor A - was represented by the cultivated variety, A1 - Dosa, A2 - Montana A3- Monique

Factor B – represented by seed bacterization – using four Nitragin doses for the quantity of seed per one hectar, B1 – non bacterized control; B2 – bacterized control

Factor C - represented by the sowing period with two graduations: C1- sowing in 10-20 march; C2- sowing in 1-10 april. For the soy culture the experiments were three factorial, where the factor A was represented by the variety: A1- Felix; A2- Neoplata; A3 – Venera, factor B - seed bacterization using soy Nitragin: B1 nonbacterized control; B2 bacterized control, and factor C- sowing period: C1- 1-10 april and C2 -20-30 april.

RESULTS AND DISSCUTIONS

Results obtained in 2010 crop year for the pea culture

Table 1show that on average in the investigated factors the best results were obtained from Monique variety of over 1700 kg / ha, higher than obtained yield from Dora variety by 49% and a very significant difference of 587 kg / ha. Montana variety scored with a similar yield obtained from Monique.

On average for the two varieties, seed bacterization have contributed to higher yields by 14%, respectively with 211 kg / ha, significant difference in yield. Sowing delayed by 10 days reduced yield by 9%. As a conclusion, Dora variety must be removed from the culture, seed bacterization contributes with non-efficient yield increases from an economic point.

Table 1

Yield results obtained for pea culture in 2010 at Timşoara

Factor A	Factor B	Factor C		Factor A averages			
		Sowing period I	Sowing period II	Yield kg/ha	%	Difference kg/ha	Semnification
A_1- Dora	B_1- nonbacterized	1120	1010	1200	100		
	B_2- bacterized	1315	1265				
A_2- Montana	B_1- nonbacterized	1637	1525	1704	142	506	XXX
	B_2- bacterized	1882	1773				
A_3- Monique	B_1- nonbacterized	1770	1684	1787	149	587	XXX
	B_2- bacterized	2110	1725				

DL 5% = 225 DL 1% = 294 DL 0,1% = 321

Factor C averages

Specification	Sowing period I	Sowing period II
Yield kg/ha	1622	1490
%	100	91
Difference kg/ha		-132
Semnification		

DL 5% =187 DL 1% =281 DL 0,1% = 363

Factor B averages

Specification	B_1 nonbacterized	B_2 bacterized
Yield kg/ha		1662
%		114
Difference kg/ha		211
Semnification		X

DL 5% = 167 DL 1% =283 DL 0,1% = 336

Results obtained in 2010 crop year for the soybean culture

On the studied factors, the amplitude of the yield was between 1906 kg / ha and 2880 kg / ha. On average, for the studied factors, the best results were obtained for the variety Venera, where yield was by 24% respectively 500 kg / ha higher than the yield obtained for the control variety Felix .Variety Neoplata scored with a yield of 2361 kg / ha, higher than control variety by 11%. Bacterization had a beneficial effect, yield growth was about 24%, returning a very significant difference of 279 kg / ha. Between the two sowing periods did not record differences in level of significance, because in this year and in the second sowing period the seeds have benefited from the water need to germinate and emergence, water critical phase of this species.

Table 2

Yield results obtained in 2010 crop year for soy culture

Factor A	Factor B	Factor C		Factor A averages			
		Sowing period I	Sowing period II	Yield kg/ha	%	Difference kg/ha	Semnification
A_1- Felix	B_1- nonbacterized	2015	1916	2122	100		
	B_2- bacterized	2325	2260				
A_2- Neoplata	B_1- nonbacterized	2382	2144	2361	111	239	X
	B_2- bacterized	2594	2385				
A_3- Venera	B_1- nonbacterized	2503	2440	2632	124	510	XXX
	B_2- bacterized	2880	2705				

DL5% = 183 DL 1% =271 DL 0,1% = 303

Factor C average

Specification	Sowing period I	Sowing period II
Yield kg/ha	2557	2297
%	100	93
Difference kg/ha		-150
Semnification		

DL 5% = 191 DL 1% =273 DL 0,1% =332

Factor B average

Specification	B_1-nonbacterized	B_2- bacterized
Yield kg/ha	2232	2511
%	100	123
Difference kg/ha		279
Semnification		XXX

DL 5% = 130 DL 1% = 169 DL 0,1% = 227

Results obtained in 2010for the lentils culture

Table 3 shows that in the year less favorable to this crop, excessively wet during the bloom – flowering- fertilization- seed formation, were variants with yields more than 850 kg / ha wich by the good price of seeds ensures the economic efficiency of the culture. From the row distances optimal proved to be 12.5 cm, increasing or decreasing the distance resulting in yield losses. Sowing at the temperature of 3-4 0C is important, plants are in emergence and runs its growing phase in periods with temperatures favorable for crops. Optimal culture density was 200 b.g. / m2

Table 3

Yield results obtained in 2010 crop year for lentils culture

Factor A	Factor B	Factor C				Factor A averages			
		100 bg.	200 bg.	300 bg.	400 bg.	Yield kg/ha	%	Difference kg/ha	Semnification
6,25 cm	B_1. Sowing period I	520	715	702	505	554	100		
	B_2. Sowing period II	480	540	506	462				
12,50 cm	B_1. Sowing period I	744	883	802	735	741	133	187	X
	B_2. Sowing period II	620	201	744	602				
25 cm	B_1. Sowing period I	719	812	801	703	696	175	142	
	B_2. Sowing period II	602	678	655	601				

DL 5% = 155 DL 1% = 201 DL 0,1% = 257

Factor C averages

Specification	100 bg.	200 bg.	300 bg.	400 bg.
Yield kg/ha	614	739	702	601
%	100	120	114	97
Difference kg/ha		125	88	-13
Semnification				

DL 5% =201 DL 1% = 298 DL 0,1% =374

Factor B averages

Specification	B_1. Sowing period I	B_2. Sowing period II
Yield kg/ha	720	603
%	100	83
Difference kg/ha		-117
Semnification		

DL 5% = 173 DL 1% = 234 DL 0,1% = 305

Analysis results on the protein content

Evolution of the protein contain in pea culture depending by variety, seed bacterization and cultivated area.

Figure 1 shows the results of tests conducted on samples from the experimental field of Timis Plain.

The results show an amplitude between 25.5% and 28.2%. The lowest content was determined by the variety Montana for nonbacterized variant and the highest by the variety Monique for the bacterized variant. Noted that for all varieties from the variants where seeds were bacterized with Nitragin, the protein content was higher. Thus, by 1.2% for the variety Dora, up to 1.3% variety Montana and 1.1% variety Monique.

Evolution of the protein contain in soy culture depending by variety, seed bacterization and cultivated area.

The results of tests conducted on samples from the experimental fild of Timiş Plain shows a dispersion between extrem values 35.4%, of variety Neoplata in the nonbacterized variant and 38.1% for the variety Felix bacterized variant. On average for the bacterized and nonbacterized variants, the protein content ranged from 37.2% to 37.3% for the Felix and Venera varieties and 36.3% variety Neoplata.

Evolution of the protein contain in lentils culture depending by variety, seed bacterization and cultivated area.

Figure 3 shows that early sowing, when the soil temperature is about 3-4^{0}C provided the protein content increased by 1.2% in the Timis Plain while the later sowing, when the soil temperature stabilizes 7-8 ^{0} C, variant where entire growing season was delayed by about a

week. In the Timis Plain, on average over experimental sowing periods the protein content was higher by 1.3%.

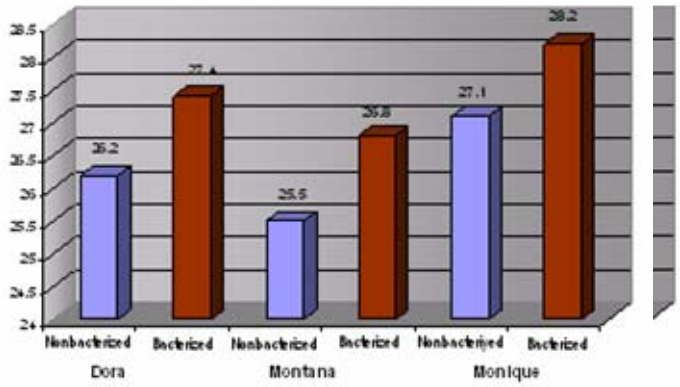

Figure 1. Variation in protein content (%) for the 2010 year crop fromTimisoara on three varieties of pea according to seeds bacterization.

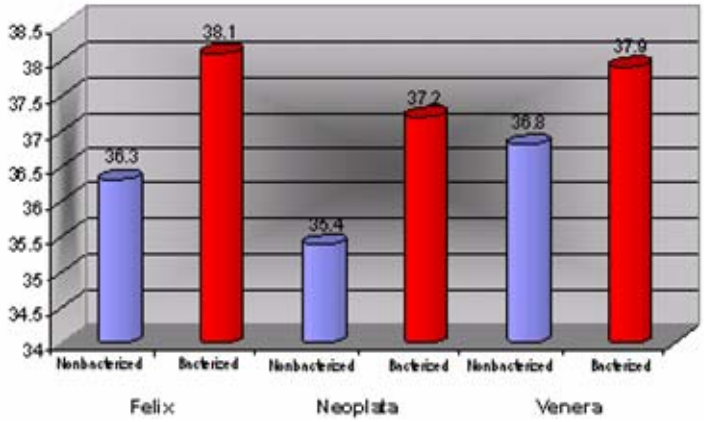

Figure. 2. Variation in protein content (%) for the 2010 year crop from Timisoara on three varieties of soybean according to seed bacterization

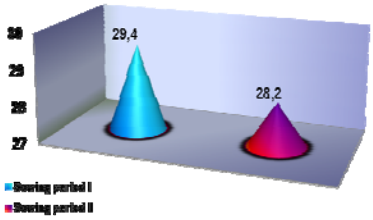

Figure 3. Variation of the protein contain in lentils culture depending by sowing period and cultivated area

CONCLUSIONS

1. Pea is a crop with growing requirements to the vegetative factors that are found in the area in which investigations were conducted.

2. Dora crop variety should be replaced with Monique and Montana in the Banat Plain . Seed treatment with Nitragin and earlier sowing are technological links wich provide yield increases economicaly efficient.

3. In all three cultures the protein content was favorized by growing area. Seeds treatment of with bacterial preparation Nitragin has a favorable influence on the protein content as a result of better plant nitrogen supply.

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