ON THE IMPACT OF FERTILISATION AND ON SOWING DENSITY ON YIELD FEATURES IN SOY IN THE SOIL AND CLIMATE CONDITIONS OF THE LOW MURES PLAIN (ROMANIA)

INFLUENȚA FERTILIZĂRII ŞI A DISTANȚEI ÎNTRE RÂNDURI ASUPRA ÎNSUŞRILOR DE PRODUCTIVITATE LA SOIA ÎN CONDIȚIILE PEDOCLIMATICE DIN CÂMPIA JOASĂ A MUREŞULUI

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Abstract *Research was carried out on a typical chernozem at Variaş, during the experimental cycle 2004-2006. We made research concerning plant height, number of branches, height of insertion of the first level of pods, the number of pods per plant, the number of beans per plant, and the weight of the beans per plant. The elements under study were influenced by both fertilisation level and row distance: thus, for a row distance of 25.00 cm, we got the highest height of the plant and of the first pod insertion level, while the other productivity elements reach maximal values in the variant whose row distance is 37.50 cm. The variant whose row distance was 50.00 cm yielded the highest number of ramifications.*

Rezumat *Cercetările s-au efectuat pe un sol cernoziom tipic, din teritoriul Variaş, în ciclul experimental 2004-2006. S-au efectuat cercetări privind înălțimea plantei, numărul de ramificații, înălțimea de inserție a primului etaj de păstăi, numărul de păstăi pe plantă, numărul de boabe pe plantă şi greutatea boabelor pe plantă.Elementele luate în studiu au fost influențate atât de nivelul de fertilizare cât şi de distanța între rânduri, astfel la distanța de 25 cm între rânduri s-a obținut cea mai mare talie a plantei şi înălțimii de inserție a primului etaj de păstăi, iar celelalte elemente de productivitate ating valori maxime pe varianta semănată la 37,5 cm. Varianta semănată la 50 cm a înregistrat cel mai mare număr de ramificații.*

Key words: *soy, fertilisation, and sowing distance*
Cuvinte cheie: *soia, fertilizare, distanță de semănat*.

INTRODUCTION

Soy is the main oil and protein plant in the Banat's Plain.

In this area, where soils are favourable to soy crops, fertilisation and sowing distance are technological steps with direct impact on yield and yield expenses.

The Românesc cultivar has been developed at the Fundulea Institute; it is a precocious cultivar (00) with a 150-day vegetation period. It can yield over 4,000 kg/ha in southern Romania, in irrigation conditions.

MATERIAL AND METHOD

Trials have been of the bi-factorial type, set after the sub-divided plots and with three replications:

- factor A – agri-fund, with three graduations:
  - $N_0P_{60}K_{60}$;
  - $N_{50}P_{60}K_{60}$;
  - $N_{100}P_{60}K_{60}$.
- factor B – row distance:
  - 25.00 cm;
  - 37,50 cm;

❖ 50.00 cm.

The cultivar under study was the Românesc cultivar.

Winter wheat was the pre-emergent crop.

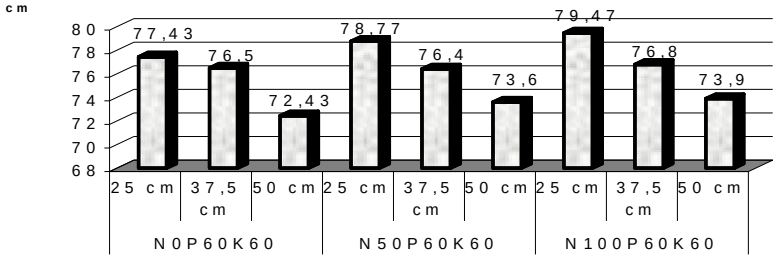
Sowing was done in the second decade of April, with a sowing density of 55 g.g./m^2, and 3-4 cm deep in the soil.

During vegetation, we made measurements concerning the impact of the factors under study.

RESULTS AND DISCUSSION

Figure 1 shows data concerning plant height depending on row distance and nitrogen rate.

The highest value in plant height was in the variant sowed with at a row distance of 25.00 cm fertilised with N_{100}, on a constant agri-fund of $P_{60}K_{60}$.



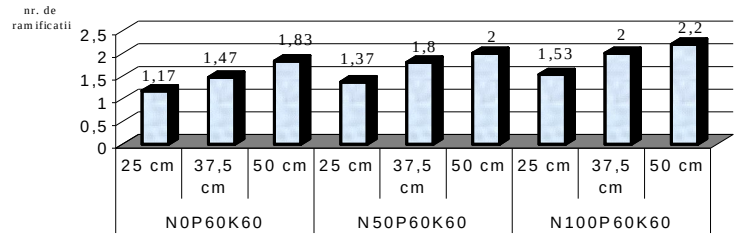
X	77,43	76,5	72,43	78,77	76,4	73,6	79,47	76,8	73,9
S^2	25,78	29,05	48,78	22,11	28,31	22,77	22,12	23,56	33,62
S	5,08	5,39	6,98	4,7	5,32	4,77	4,7	4,85	5,8
S_X	0,51	0,54	0,70	0,47	0,53	0,48	0,47	0,49	0,58
S%	6,56	7,05	9,64	5,97	6,96	6,48	5,91	6,63	7,85

Figure 1. Data concerning plant height depending on row distance and nitrogen rate in experimental cycle 2004-2006

Figure 2 shows the number of ramifications per plant.

The highest number of ramifications per plant was in the variant sowed at a sowing distance of 50.00 cm and fertilised with N_{100}, the average value being 2.2.

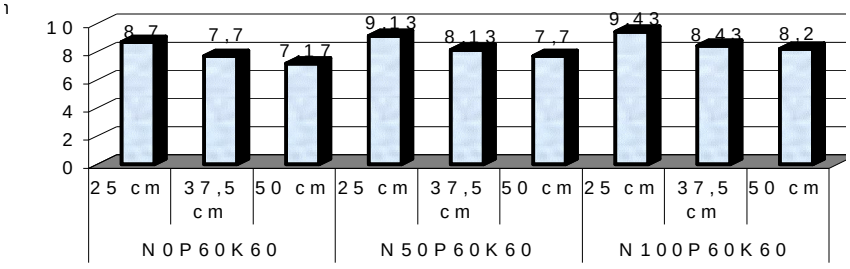
Sowing at a sowing distance of 25.00 cm diminished the number of ramifications per plant to 1.17.



X	1,17	1,47	1,83	1,37	1,8	2	1,53	2	2,2
S^2	0,54	0,85	1,27	0,63	0,96	1,33	0,85	1,13	1,29
S	0,73	0,92	1,13	0,8	0,98	1,15	0,92	1,06	1,14
S_X	0,07	0,09	0,11	0,08	0,10	0,12	0,09	0,11	0,11
S%	62,39	62,59	61,75	58,39	54,44	57,50	60,13	53,00	51,82

Figure 2. The number of ramifications per plant

The values of insertion height of the first level of pods (Figure 3) were between 8.7 cm in the variant sowed at a sowing distance of 25.00 cm on an agri-fund of $N_0P_{60}K_{60}$ and 9.43 cm in the same variant sowed at a sowing distance of 25.00 cm, but on an agri-fund of $N_{100}P_{60}K_{60}$.



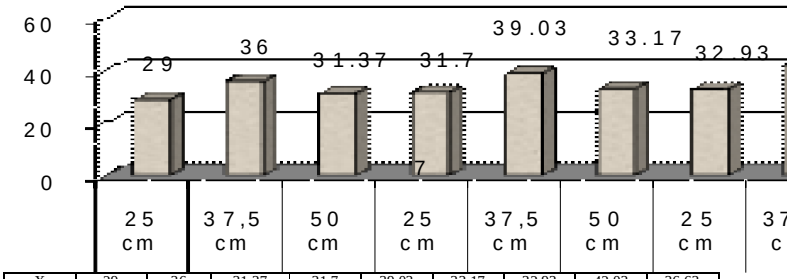
X	8,7	7,7	7,17	9,13	8,13	7,7	9,43	8,43	8,2
S^2	1,63	0,88	1,16	1,43	1,03	1,28	1,38	1,45	1,29
S	1,28	0,94	1,07	1,2	1,02	1,13	1.17	1,2	1,14
S_X	0,13	0,09	0,11	0,12	0,10	0,11	0,12	0,12	0,11
S%	14,71	12,21	14,92	13,14	12,55	14,68	12,41	14,23	13,90

Figure 3. The insertion height of the first level of pods

Figures 4, 5, and 6 show the most important productivity elements depending on fertilisation and row distance.

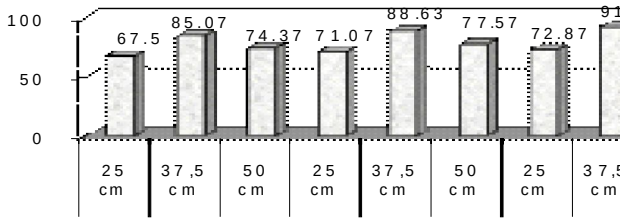
The number of pods per plant (Figure 4) varied between 29 pods per plant in the variant sowed at a sowing distance of 25.00 cm fertilised with $N_0P_{60}K_{60}$ and 42.03 pods per plant in the variant sowed at a sowing distance of 37.50 cm fertilised with $N_{100}P_{60}K_{60}$.

Likewise, the number of beans per plant (Figure 5) and beans weight per plant (Figure 6) recorded the highest value in the variant sowed at a sowing distance of 37.50 cm on an agri-fund of $N_{100}P_{60}K_{60}$.



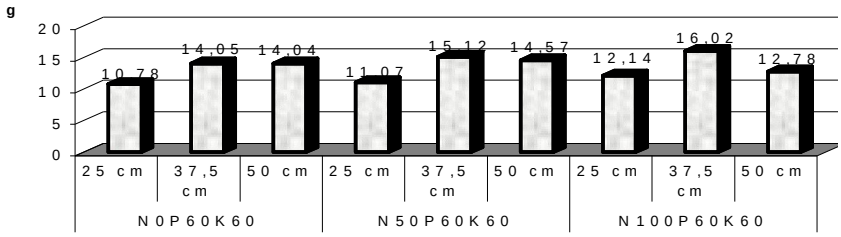
X	29	36	31,37	31,7	39,03	33,17	32,93	42,03	36,63
S^2	31,73	35,93	45,23	19,94	36,03	39,01	31,35	37,7	36,37
S	5,63	5,99	6,73	4,47	6	6,25	5,62	6,14	6,03
S_X	0,56	0,60	0,67	0,45	0,60	0,63	0,56	0,61	0,60
S%	19,41	16,64	21,45	14,10	15,37	18,84	17,07	14,61	16,46

Figure 4. The number of pods per plant



X	65,7	85,07	74,37	71,07	88,63	77,57	72,87	91,93	82,8
S^2	438,2	386,0	297,83	335,2	343,5	344,25	365,9	375	370,2
S	20,93	19,65	17,26	18,31	18,54	18,55	19,13	19,36	19,24
S_X	2,09	1,97	1,73	1,83	1,85	1,86	1,91	1,94	1,92
S%	31,01	23,10	23,21	25,76	20,92	23,91	26,25	21,06	23,24

Figure 5. The number of beans per plant



X	10,78	14,05	14,04	11,07	15,12	14,57	12,14	16,02	12,71
S^2	9,07	23,19	26,11	6,78	16,41	15,29	13,07	23,5	12,96
S	3,01	4,82	5,11	2,6	4,05	3,91	3,61	4,85	3,6
S_X	0,30	0,48	0,51	0,26	0,41	0,39	0,36	0,49	0,36
S%	27,92	34,31	36,40	23,49	26,79	26,84	29,74	30,27	28,32

Figure 6. The beans weight per plant

CONCLUSIONS

1. Nitrogen fertilisers applied on a constant agri-fund of phosphorus and potassium result in an increase of the number of productivity elements.

2. The lowest weight of the beans per plant (16.20) was in the variant sowed at a sowing distance of 37.50 cm and fertilised with N_{100}.

3. Optimal sowing distance proved to be 37.50 cm.

4. Insertion height of the first pod level decreases with row distance.

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