ON THE IMPACT OF FERTILISERS ON SYMBIOTIC BACTERIA IN CHICK PEA

INFLUENȚA FERTILIZĂRII ASUPRA BACTERIILOR SIMBIOTICE LA NĂUT

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Abstract. *Research was carried out during the experimental cycle 2004-2006 at Varias, on a typical chernozem. We studied four bacterial strains (NT4, NT5, NT16, and NT17). Results pointed out the negative impact of applying nitrogen fertilizers on the number of nodosities and on their weight. Among bacterial strains tested on the agri-fundN0 and N30, to notice NT17. On the agri-fund fertilized with N60, the total number of nodosities was close to the number of nodosities in all the strains studied.*

Rezumat. *Cercetările s-au desfăşurat în ciclul experimental 2004-2006, în teritoriul Variaş, pe un sol de tip cernoziom tipic. S-au luat în studiu patru tulpini bacteriene (NT4, NT5, NT16 şi NT17) . Rezultatele obţinute au evidenţiat influenţa negativă a aplicării îngrăşămintelor cu azot asupra numărului de nodozităţi şi a greutăţii acestora. Dintre tulpinile bacteriene testate pe agrofondul N_0 şi N_{30} s-a remarcat NT17. Pe agrofondul fertilizat cu N_{60} numărul total de nodozităţi a fost apropiat la nivelul tuturor tulpinilor cercetate.*

Key words: *chick pea, bacterial strains, and fertilizing*
Cuvinte cheie: *năut, tulpini bacteriene, fertilizare*.

INTRODUCTION

Chick pea is a legume cultivated for beans, with a good drought resistance and with a yielding potential at the level of present pea and soy cultivars.

Due to this fact and to its food value, chick pea is increasingly important as a crop in Romania.

Research is motivated as it aims at expanding the crop in the Romanian Western Plain.

MATERIAL AND METHOD

The trials were of the bi-factorial type and organized after the sub-divided plot method, in which:

- factor A – bacterial strain – NT 4
  -NT5
  -NT16
  -NT17
- factor B – fertilizing level – N0P60K40
  -N30P60K40
  -N60P60K40

The cultivar under study was Cicero 1.

The pre-emergent plant was winter wheat.

Sowing was done in the second decade of April, with a sowing density of 40 g.g./m^2.

We made measurements concerning the number of nodosities per main root, the number of nodosities per ramification, the total number of nodosities, as well as their fresh weight.

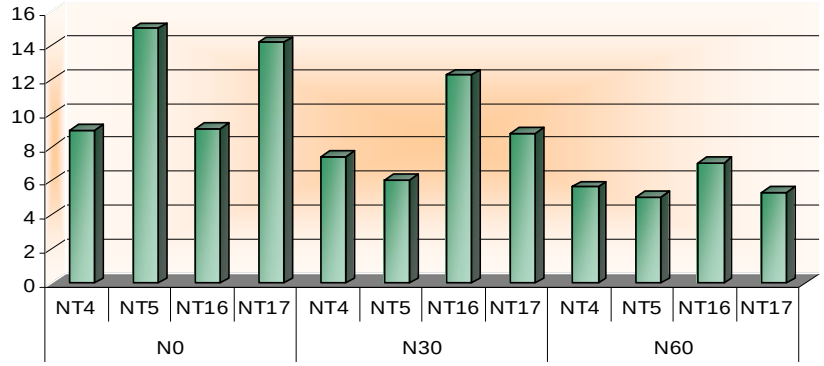
RESULTS AND DISCUSSION

Figure 1 presents the number of nodosities per main root depending on the agri-fund, and the bacterial strain used in treating the seeds.

On the fund not fertilized with nitrogen we noticed the strains NT5 and NT17, strains that proved sensitive to nitrogen fertilization. Thus, by fertilizing with N30 – starter – in the variant treated with NT5 we recorded the lowest number of nodosities, which diminished even more on the fund fertilized with N60.

This trend was also recorded in the variant treated with NT17.

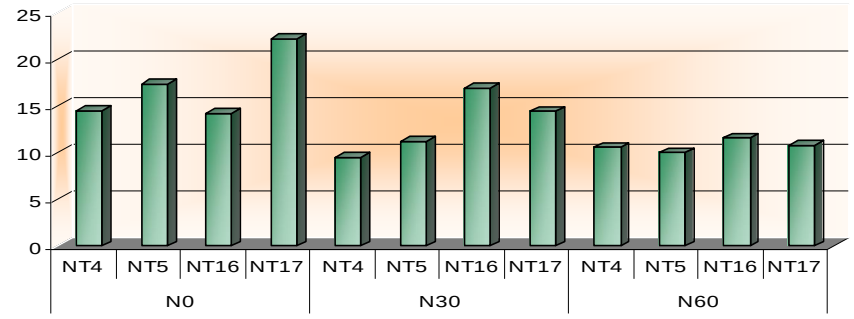
To note the positive effect of nitrogen fertilization on the number of nodosities in the variant treated with NT17, which was the highest on the fund treated with N30 and kept high on the fund treated with N60.



X	9	15	9.08	14.1	7.42	6.08	12.2	8.83	5.67	5.08	7.08	5.33
S^2	3.67	3.17	1.58	1.81	1.41	0.58	5.85	0.81	1.56	0.41	0.58	0.56
S	1.91	1.78	1.26	1.34	1.19	0.76	2.42	0.9	1.25	0.64	0.76	0.75
Sx	0.19	0.18	0.13	0.13	0.12	0.08	0.24	0.09	0.13	0.06	0.08	0.08
S%	21.2	11.8	13.8	9.46	16.0	12.5	19.7	10.1	22.0	12.6	10.7	14.0

Figure 1. Number of nodosities per main root

The same trend also results from Figure 2, in which we present the number of nodosities per ramification.

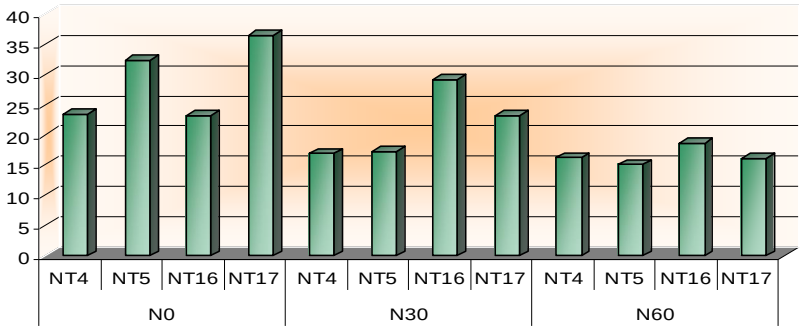


X	14.5	17.3	14.1	22.2	9.5	11.2	16.9	14.4	10.5	10	11.5	10.7
S^2	0.92	16.8	6.47	7.52	1.25	3.35	6.91	4.58	3.08	2.67	2.58	4.35
S	0.96	4.11	2.54	2.74	1.12	1.83	2.63	2.14	1.75	1.63	1.61	2.09
Sx	0.10	0.41	0.25	0.27	0.11	0.18	0.26	0.21	0.18	0.16	0.16	0.21
S%	6.62	23.7	17.9	12.3	11.7	16.2	15.5	14.8	16.5	16.3	13.9	19.4

Figure 2. Number of nodosities per ramification

Figure 3 represents, practically, the summing of the nodosities formed on the main root and ramifications, with emphasis on the variants treated with NT17 and NT5 on the non-fertilised fund.

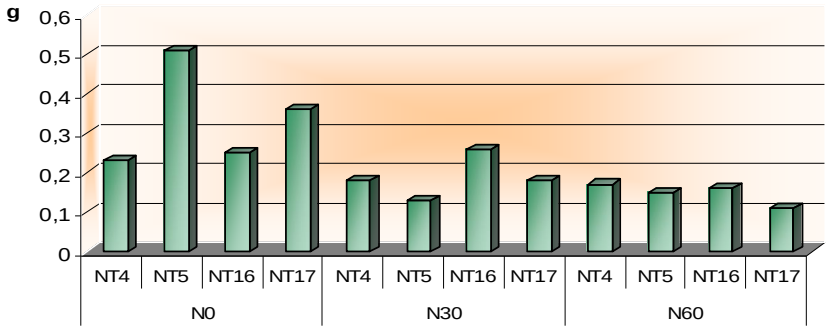
On the fund fertilized with N60 there is a levelling trend of the number of nodosities with a slight superiority in the variant treated with NT16.



X	23.5	32.3	23.2	36.4	16.9	17.3	29.1	23.2	16.2	15.0	18.6	16.0
S^2	4.92	21.7	10.1	11.2	2.74	3.39	9.64	6.52	6.19	3.41	3.56	7.08
S	2.22	4.66	3.19	3.35	1.66	1.84	3.1	2.55	2.49	1.85	1.89	2.66
Sx	0.22	0.47	0.32	0.34	0.17	0.18	0.31	0.26	0.25	0.19	0.19	0.27
S%	9.45	14.4	13.7	9.20	9.81	10.6	10.6	10.9	15.3	12.2	10.1	16.5

Figure 3. Total number of nodosities

The weight of nodosities in all the variants was higher on the fund not fertilised with nitrogen and it diminished with the increase of the nitrogen rate.



X	0.23	051	0.25	0.36	0.18	0.13	0.26	0.18	0.17	0.15	0.16	0.11
S^2	0	0	0	0	0	0	0	0	0	0	0	0
S	0.03	0.06	0.06	0.07	0.02	0.02	0.04	0.03	0.02	0.03	0.03	0.01
Sx	0	0.06	0.01	0.01	0	0	0	0	0	0	0	0
S%	13.0	117	24.0	19.4	11.1	15.3	15.3	16.6	11.7	20.0	18.7	9.09

Figure 4. Weight of nodosities (g)

CONCLUSIONS

Nitrogen fertilizers have a negative impact on the number and weight of the nodosities in all the bacterial strains we tested.

When fertilizing, one should choose the bacterial strains NT5 and NT17.

When fertilizing with nitrogen rates of N30-60 on a constant fund of P60K40, we could see a levelling of the number of nodosities no matter the bacterial strain we used.

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