EXPERIMENTAL RESULTS ON NITROGEN FERTILIZER FORMS AND DOSAGE APPLICATIONS FOR PRODUCTIVITIES

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ABSTRACT

In the complex of measures regarding the establishment, maintenance and use of temporary (sown) meadows, fertilization is a first factor in achieving large, constant and long-lasting productions. Each form of fertilizer in our experience was researched in increasing doses: N_O, N_{60}, N_{120}, N_{180} with fractional application for each crop. Harvesting was carried out in hay and the production was expressed in tons of dry matter per hectare. Considering the production obtained with ammonium nitrate as a reference level, it is found that among the other forms of nitrogen fertilizer, nitrocalcare proved to be the most effective, with increases of 4-6%, urea behaved similarly to ammonium nitrate and ammonium sulfate, determined the smallest increases (3- 3.5%) of production.

INTRODUCTION

The cultivation of mixtures of perennial grasses and legumes for the establishment of temporary meadows, has a number of advantages, including high economic efficiency. This high economic efficiency must be attributed, first of all, to the economy that can be achieved with mineral fertilizers. with nitrogen (Anghel Gh. 1984, Bărbulescu C.ş.a. 1991, Cotigă C. 2005). Fertilization of mineral fertilizers with nitrogen has very important implications in a meadow. (Moga I. 1983, Cotigă C. 2012).

MATERIAL AND METHOD

The research was performed on luvosol from S.C.D.A. Şimnic-Craiova, in non-irrigation conditions and capitalized starting with 2020.

The method of placing the experience was in the plots subdivided with three factors, namely:

Factor A - doses of phosphorus and potassium with three graduations:
- a1-PO
-a2 P70
-a3-P7OK50

Factor B - forms of nitrogen fertilizers, with four grades:
- b1-Ammonium nitrate
- b2-Ammonium sulphate
-b3-Nitrocalcare
-b4-Urea

Factor C nitrogen doses with four grades:
-c_1-NO
-c_2-N60
-c_3- N120
-c_4-N180

The sowing mixture consisted of 70% perennial grasses (Dactylis glomerata 25% + Festuca arundinacea 30% + Lolium perenne 15%) and 30% perennial legumes (20% Medicago sativa, 10% Lotus corniculatus).

RESULTS AND DISCUSSION

If the results obtained and presented in Table 1, regarding the effect of nitrogen forms and nitrogen doses on the productivity of the temporary grassland, on the luvosol from S.C.D.A. Şimnic-Craiova, we find the following aspects:

Depending on the factors studied, the production of s.u. had values between 2.0-7.6 t / ha s.u.

Separately, in the form of nitrogen, the harvest ranged from 2.0 t / ha (NO) to 6.5 t / ha s.u. (N180) in the case of ammonium nitrate; from 1.6 t / ha (NO) to 5.6 t / ha s.u. (N180) in the case of ammonium sulphate; of 2.3 t / ha s.u. (NO) at 7.6 t / ha s.u. (N180) in the case of nitrocalcary; of 2.0 t / ha s.u. (NO) at 7.2 t / ha s.u. (N180) in the case of urea.
Very significant production increases were given by the variants: ammonium nitrate at doses of N120 (4.3 t / ha s.u.) and N180 (4.3 t / ha s.u.);
- ammonium sulphate at doses of N120 (3.3 t / ha s.u.) and N180 (3.6 t / ha s.u.);
- nitrocalc at doses of N60 (3.4 t / ha s.u.), N120 (5.4 t / ha s.u.) and N180 (5.6 t / ha s.u.);
-urea, at doses of N120 (5.1 t / ha s.u.) and N180 (5.2 t / ha s.u.).

Table 1.

The effect of nitrogen forms and nitrogen doses on s.u. at the temporary meadow on the luvosol from S.CD.A. Simnic-Craiova (2020) t / ha

SPECIFICATION		ABSOLUTE PRODUCTION	RELATIVE PRODUCTION%	DIFFERENCE	SIGNIFICANCE
AMMONIUM NITRATE	N_0	2,0	100		-
	N_{60}	3,6	180	1,6	*
	N_{120}	6,3	315	4,3	***
	N_{180}	6,5	325	4,3	***
AMONIUM SULFATE	N_0	1,6	80	0,4	-
	N_{60}	3,1	155	1,1	*
	N_{120}	5,3	265	3,3	***
	N_{180}	5,6	280	3,6	***
NITROCALCAR	N_0	2,3	115	0,3	-
	N_{60}	5,4	270	3,4	***
	N_{120}	7,4	370	5,4	***
	N_{180}	7,6	380	5,6	***
UREE	N_0	2,0	100	-	-
	N_{60}	5,1	255	3,1	**
	N_{120}	7,1	355	5,1	***
	N_{180}	7,2	360	5,2	***

DL 5% 1,1 t/ha s.u.
DL 1% 2,4 t/ha s.u.
DL 0,5% 3,3 t/ha s.u.

If we refer to the effect of nitrogen doses only on the production of s.u. at the temporary meadow (figure 1), we find that it had values between 4.6 t / ha s.u. in the ammonium nitrate variant (and considered by us as a control) and 5.7 t / ha s.u. in the nitrocalcary variant, when the increase brought is distinctly significant; also, a significant increase in yield is given by the urea variant at a production of 5.4 t/ha s.u.

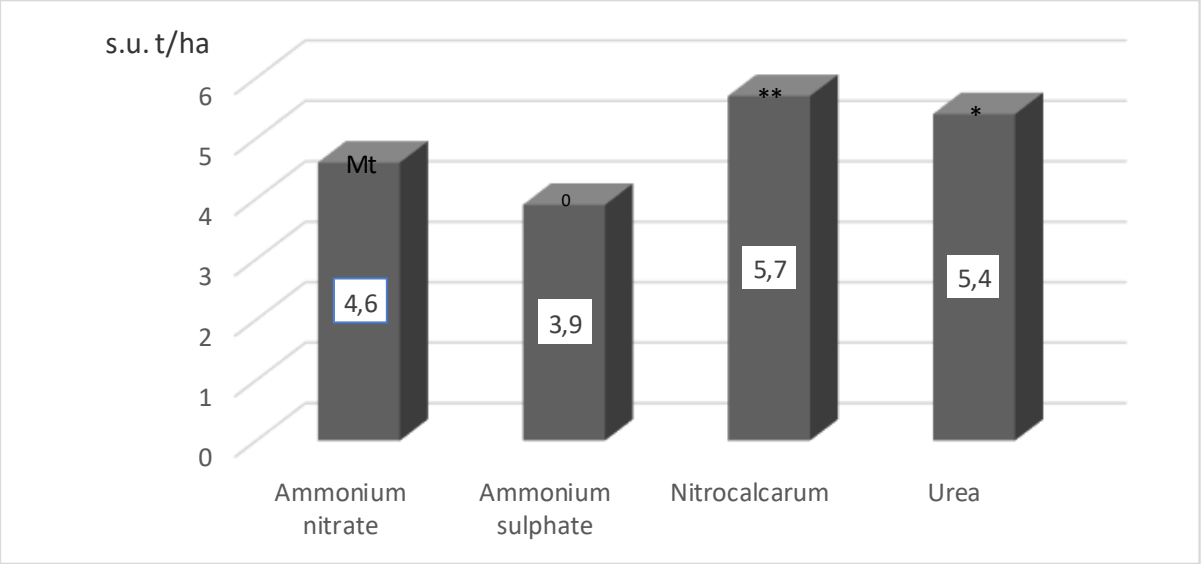

Figure 1. The effect of nitrogen forms on the production of s.u. to the temporary meadow on the luvosol from S.C.D.A. Şimnic-Craiova (2020)

Regarding the effect of nitrogen doses on the production of s.u. at the temporary meadow (Figure 2) the following are found:

-the harvest oscillated from 2.0 t / ha s.u. (NO) at 6.5 t / ha s.u. (N180) and in which the reduced increase is very significant;

-a harvest very close to the maximum was also obtained for the variant that received N120 (6.4 t / ha s.u.) with a very significant increase compared to the considered control;

-a significant increase in production was also reduced by fertilization with N160 (3.6 t / ha s.u.).

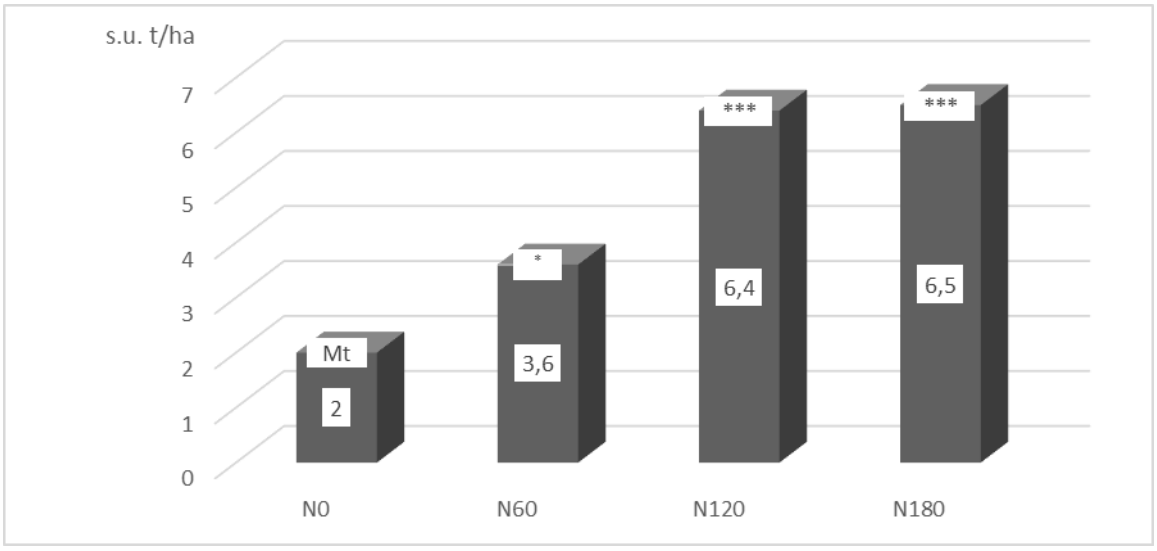

Figure 2. The effect of nitrogen doses on s.u. at the temporary meadows, on the luvosol from S.C.D.A. Şimnic-Craiova (2020)

CONCLUSIONS

Based on the preliminary results obtained and presented regarding the study of nitrogen forms and nitrogen doses applied to the temporary meadow on the luvosol from S.C.D.A. Şimnic-Craiova, we conclude the following:

-compared to the other forms of nitrogen, nitrocalcare proved to be the most efficient, giving a harvest of 5.7 t / ha s.u.;

-a harvest very close to the maximum, was also obtained in the form of nitrogen, urea, namely 5.4 t / ha S.u .;

-the optimal dose from an economic point of view proved to be N120, which for the first year of research gave a production of 6.4 t / ha s.u. and in which the increase was very statistically significant3;

-a production very close to the maximum, namely 6.5 t / ha s.u. was obtained at a dose of N180.

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