THE EFFECT OF THE INTERACTION OF FERTILIZATION WITH MACROELEMENTS ON THE PRODUCTION OF TEMPORARY GRASSLANDS ESTABLISHED IN ARABLE LAND

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ABSTRACT

In the complex of measures for the establishment, maintenance and use of temporary (seeded) grassland, fertilization is a major factor in achieving large, good quality, constant and for as long as possible.
For the ecopedological conditions at S.C.D.A. Șimnic- Craiova, in the fertilization of temporary non-irrigated meadows can be used practically with the same efficiency, ammonium nitrate, urea and especially nitrocalcare.
The administration of nitrogen at the level of the dose of N_{120} divided by crops, shows very significant increases in yield.
On the P_{70} agrofounder, ammonium nitrate, nitrocalcar and urea achieved increased biomass productions between 7,3-8,3 t / ha d.s.

INTRODUCTION

In the central area of Oltenia, the temporary meadow cannot be perceived without providing the necessary fertilizers, as low soil fertilization is a real limiting factor for these valuable crops (Cotigă C. 2003; Cotigă C. 2012)
The productions obtained from the temporary non-irrigated meadows are small, rarely exceeding 7-8 t/ha of green mass and of mediocre quality.(Bărbulescu C. and colab., 1991)
Considerable areas, especially in plain or hilly areas, are in fact unproductive lands. (Bărbulescu C.; Motcă Gh., 1987)
The problem of the meadows in our country must be reconsidered in a vision in which the soil-plant-animal relationship should be. (Moga I. and colab., 1983)

MATERIAL AND METHOD

On the luvosol from S.C.D.A. Şimnic-Craiova was located an experiment (2020) in which the temporary meadow consisted of: 60% perennial grasses and 40% perennial fodder legumes.
The experiment was three-factor, in four repetitions with the following factors studied:
Factor A - doses of phosphorus and potassium with three graduations:

- a1-P_O
- a2 P_{70}
- a3-$P_{7O}K_{50}$

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:

- c1-N_O

- c2-N_{60}
- c3- N_{120}
- c4-N_{180}

Harvesting green mass samples were taken from each harvesting was performed in hay, variant-repetition (200 g each) to determine the dry matter and other laboratory analyzes.

RESULTS AND DISCUSSION

If we refer to the results obtained and presented in table 1 regarding the influence of the interaction of phosphorus x nitrogen forms on the production of d.s. at the temporary meadow, the following are found:

Table 1.

The effect of the interaction of phosphorus x nitrogen forms on the production of temporary grasslands established in arable land (t/ha d.s.) 2021

Doses of phosphorus and azote	Nitrogen forms	Production absolute	Production relative %	Difference	Significance
P_0	Ammonium nitrate	5,7	100	Mt	-
	Ammonium sulphate	5,8	102	0,1	-
	Nitrocalcare	6,4	112	0,7	-
	Urea	6,2	109	0,5	-
P_{70}	Ammonium nitrate	7,8	137	2,1	*
	Ammonium sulphate	6,9	121	1,2	-
	Nitrocalcare	8,3	146	2,6	**
	Urea	7,3	128	1,6	*
P_{70} K_{50}	Ammonium nitrate	7,6	133	1,9	*
	Ammonium sulphate	7,1	125	1,4	*
	Nitrocalcare	7,9	139	2,2	*
	Urea	7,7	135	2,0	*

DI 5% **1,3 t/ha d.s.**
DI 1% **2,5 t/ha d.s.**
DI 0,1% **3,8 t/ha s.u**

-depending on the level of phosphorus fertilization and forms of nitrogen-based mineral fertilizers, the production of d.s. had values between 5,7 t/ha d.s. in the P_{70}-nitrocalcary variant, in which the crop increase was maximum 2,6 t/ha d.s. statistically significant distinct;
-in the variants where the agrofund was P_0, the production of d.s. was between 5,7 t/ha d.s. in the form of nitrogen, ammonium nitrate and 6,4 t/ha d.s. in the form of nitrocalcare, in which the increase was 0,7 t/ha s.u .;
-in the variants where the agrofund was P_{70}, the production of d.s. was between 6,9 t/ha d.s. in the form of ammonium nitrogen sulfate and 8,3 t/ha d.s. nitrocalcar form (Fig.1)

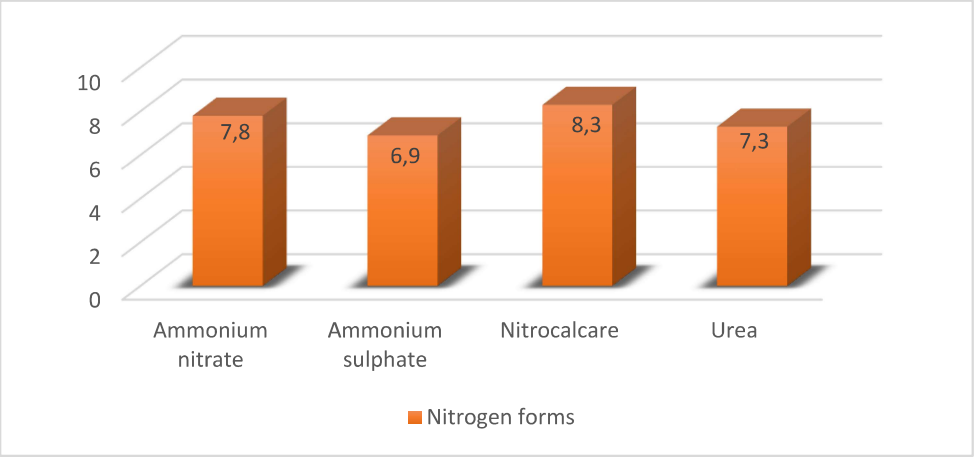

Fig.1. The effect of nitrogen forms on the P_{70} agrofund on the production of temporary meadows, established in arable land (2021)

- in the variants where the agrofund was $P_{70}K_{50}$, the production at the d.s. had values between 7,1 t/ha d.s. the form of ammonium nitrogen sulfate, respectively 7,9 t/ha d.s. to the nitrocalcare form, at which the increase of 2,2 t/ha d.s. was statistically significant.
Depending on the level of fertilization with phosphorus and nitrogen studied (table 2) production at the d.s. at the temporary meadow it had values between 1,8 t/ha d.s. in the respective P_0N_0 variant, 10,2 t/ha d.s. in the $P_{70}K_{50}N_{120}$ variant when the yield increase obtained was 8,4 t/ha d.s., very significant from a statistical point of view.

Table 2

Effect of phosphorus x nitrogen dose interaction on production on temporary grasslands established in arable land (2021) t / ha d.s.

Doses of phosphorus and potassium	Doses of azote	Production absolute	Production relative %	Difference	Significance
P_0	N_0	1,8	100	Mt	-
	N_{60}	5,7	317	3,9	**
	N_{120}	8,2	456	6,4	***
	N_{180}	8,5	472	6,7	***
P_{70}	N_0	3,3	183	1,5	-
	N_{60}	7,7	428	5,9	***
	N_{120}	9,7	539	7,9	***

	N_{180}	9,7	539	7,9	***
P_{70} K_{50}	N_0	3,1	172	1,3	-
	N_{60}	7,4	411	5,6	***
	N_{120}	10,2	567	8,4	***
	N_{180}	9,7	539	7,9	***

Dl 5% **1,6 t/ha d.s.**
Dl 1% **3,1 t/ha d.s.**
Dl 0,1 % **4,7 t/ha d.s.**

In the variants in which the agrofund was P_0, the production of d.s. oscillated between 1,8 t/ha and. (N_0) and 8,5 t/ha d.s. (N_{120}). A level of production very close to the maximum was achieved at the dose of N_{120}, namely 6,4 t/ha d.s., very statistically significant.

In the variants in which the agrofund was P_{70}, the production of d.s. varied between 3,3t/ha d.s. (N_0) and 9,2 t / ha d.s.(N_{120} şi N_{180}) (Fig.2.)

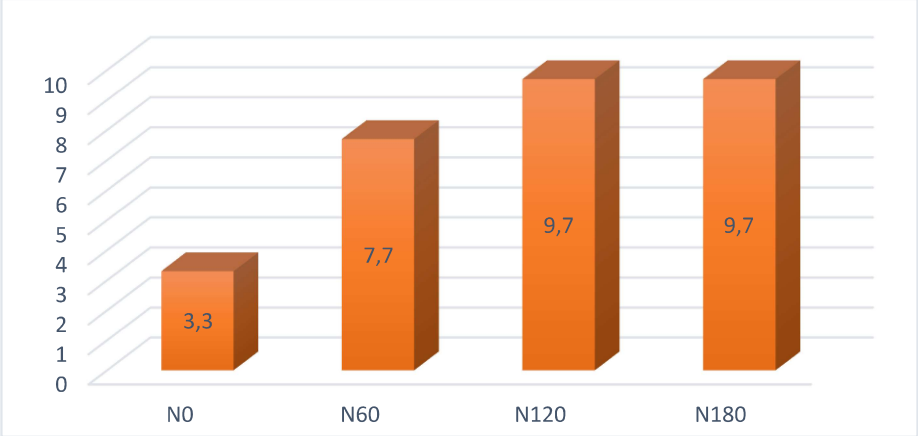

Fig.2. The effect of nitrogen doses on agrofuel P_{70} on the production of d.s. to the temporary meadows established in arable land (2021)

In the variants where the agrofund was $P_{70}K_{50}$, the production of d.s. had values between 3,1 t/ha d.s. (N_0) and 10,2 t/ha d.s. (N_{120}) when the crop increase was 8,4 t/ha d.s., very significant from a statistical point of view.

Conclusions

1. On the luvosol from S.C.D.A. Şimnic-Craiova, phosphorus fertilization in the dose of P_{70}, regardless of the applied nitrogen form, contributes to the increase of production by about 121-146% compared to unfertilized.

2. On the same agrofund of P_{70}, the forms of nitrogen: urea, nitrocalcare and ammonium nitrate, have achieved increased biomass harvests between 7,3-8,3 t/ha d.s.

3. Fertilization with the dose of N_{120} fractionated on the seams, on the agrofound P_{70} resulted a production of 9,7 t/ha d.s. with an increase of 7,9 t/ha d.s., very significant.

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