THE INFLUENCE OF NITROGEN AND ORGANIC FERTILIZERS UPON SEED PRODUCTION AT THE FESCUE *(FESTUCA PRATENSIS*)

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The researches were accomplished during period 2005-2008 at Agricultural Research and Development Station of Suceava and followed the nitrogen fertilizer effect in comparison with nitrogen from purin upon the seed production at the fescue crop (Festuca pratensis). We observed the positive effect of the mineral and organic nitrogen upon seed production when the doses were on N_{60} in the first year and N_{90} in the next years. At the doses on N_{90} in the first year and N_{120} in the next years we noticed a seeds yield decreases when the nitrogen was applied in only one round during the spring or in the autumn. But when we applied the fractioned doses (1/2 in the spring and ½ in the autumn) the seed production had a different manifestation. Also, it was produced some modifications upon the values of one thousand kernel weight function nitrogen dose, its form and administration mode.

***Key words**: fescue, perennial grasses, ammonium nitrate, purin*

Meadow fescue (*Festuca pratensis*) is a perennial grasses of high importance in the fodder production , being used not only in the complex mixtures with other grasses but also with different forage legumes. The contribution of this species is significant not only for the quantity but also for the quality of the fodder obtained; the forages obtained are balanced in a nutritive way and can be used both in the grazing or multiple mows that are meant for the direct fodder or for the hay and semi hay making [Moga Schitea]. The researches carried out in our country at a series of stations in the past years recommend for this species N_{90} [Popovici D, 1978]. The increase of the doses over the recommended one does not contribute to the increase of the production, because the plants develop their vegetative organs strong and become very sensitive to falling even before the flouring. Generally the administration of fertilizer is done during spring on a frozen soil, before the vegetation starts. The administration of nitrogen during the fall is recommended in august, the beginning of September in order to stimulate the transformation of the vegetative tillers in the generative ones.

MATERIAL AND METHOD

The experimental results presented have led to an experimental scheme that includes the purin as nitrogen fertilizer, in comparison with the one in the ammonium nitrogen.

The experimental variants were:

The A factor- dozes and forms of nitrogen:

a_1 – N_{60} in the first year and N_{90} in the next years which come from N_4NO_3;

a_2 - N_{60} in the first year and N_{90} in the next years which come from purin;

a_3 - N_{90} in the first year and N_{120} in the next years which come from N_4NO_3;

a_4 - N_{90} in the first year and N_{120} in the next years which come from purin.

The B factor- administration periods:

b_1- 1/1 from a dozes administrated during the spring;

b_2 – ½ from nitrogen dozes administrated in the spring and ½ of nitrogen administrated in the autumn;

b_3 – 1/1 from nitrogen administrated in the autumn.

The experience has been placed on a faeoziom cambic soil with a 31,6% clay content on a layer of 0-20 cm, weak acid, ph in the water = 5,6-5,8, with a content of 3,0% humus.

There has been used the advanced cultivar *Transilvania*, the sowing has been done at the distance of 0,25 m between the lines. The quantity of seed was on 12,5 kg/ha.

The researches have been carried out during 2005-2008.

The climatic conditions are represented in the first table which provides us with the conclusion that the average annual temperatures in the research period are situated between 8,1^{0}C in 2005 and 9,7^{0}C in 2007, the average in the research period was 1,1^{0}C bigger in comparison with the multiannual average. With regard to the precipitations there can observed that in all these years its total quantity was bigger than the multiannual average., and the average of the research years was 218,2 mm bigger than the multiannual average. In the vegetation period there has been registered a positive lack of precipitations in comparison with the multiannual average in the whole season of vegetation(IV-X); smaller values have been registered in the majority of vegetative resting months.(XI-III).

RESULTS AND DISSCUSIONS

The seed production reached out in the three years of production has been influenced by the fertilizer with nitrogen administrated, by the way of its administration and the year that the seed was produced, as it can be noticed in the second table.

The highest levels of the production have been registered at the N_{120} doses, and it was bigger in all the years than the N_{90} . For N_{120} there have been registered the highest productions when the de ammonium nitrate and purin were administrated in a full dozes in the spring and in the autumn the growth were statistically assured. When the nitrogen dozes was N_{90} in the production years , the production has varied between 630-780 kg/ha, in the first year between 621-740 kg/ha and in the third year between 616-710 kg/ha. At this dozes the biggest production has been reached for the purin and it was administrated half in the autumn and half in the spring.

Moreover there can be noticed that the average production on experience was in the first year of production of 801k/ha, decreased in the second year to 733 kg/ha, and in the third year reached to 718 kg/ha.

Table 1

Climatic conditions in the research period 2005-2008

Specifications	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Average or total
Average monthly temperatures													
2005	-0.7	-4.4	0.7	8.2	14.1	16.5	19.5	17.9	14.8	9.5	1.9	-0.6	8.1
2006	-7.8	-3.0	0.1	9.0	13.9	16.6	19.8	18.8	14.9	9.9	5.2	1.8	8.3
2007	3.7	-0.6	5.9	9.2	16.3	19.9	21.5	19.7	13.5	8.7	0.9	-2.6	9.7
2008	-3.1	3.3	4.9	9.6	13.7	18.3	19.2	20.0	13.0	9.7	3.8	0.6	9.4
Average 2005-2008	-2.0	-1.2	2.9	9.0	14.5	17.8	20.0	19.1	14.1	9.5	3.0	-0.2	8.9
Multiannual average	-4.1	-2.3	+1.2	+8.0	13.7	16.9	18.4	18.3	14.2	8.4	2.4	-1.9	7.8
Standard deviation ±	+2.1	+1.1	+1.7	+1.0	+0.8	+0.9	+1.6	+0.8	-0.1	+1.1	+0.4	+0.7	+1.1
Precipitations –mm													
2005	36.0	40.2	19.7	100.6	108.9	116.9	45.3	223.4	20.5	29.7	29.7	22.6	793.5
2006	19.4	20.5	61.0	73.0	70.7	164.7	119.6	211.5	35.1	29.7	9.8	1.8	816.8
2007	10.1	45.2	41.8	32.9	53.9	30.7	105.8	169.0	67.4	87.0	43.4	34.3	721.5
2008	5.7	23.9	15.9	135.2	91.5	99.2	301.6	72.3	60.4	43.4	8.0	29.9	887.0
Average 2005-2008	17.8	32.5	34.6	85.4	81.3	102.9	143.1	169.1	45.9	47.5	22.7	22.2	805.0
Multiannual average	24.2	25.6	36.2	48.2	80.2	93.6	88.6	62.8	40.8	29.5	30.6	26.5	586.8
Standard deviation ±	-6.4	+6.9	-1.6	+37.2	+1.1	+9.3	+54.5	+106.3	+5.1	+18.0	-7.9	-4.3	+218.2

Table 2

The seed production obtained for fescue *(Festuca pratensis*)

Variant	Seeds yield (kg/ha)			Average	Diferences		Signification
	2006	2007	2008		kg/ha	%	
a_1b_1	765	701	680	715	-36	95	
a_1b_2	753	650	646	683	-68	91	0
a_1b_3	682	675	616	658	-93	88	00
a_2b_1	757	665	690	704	-47	94	
a_2b_2	630	621	623	625	-126	83	000
a_2b_3	780	740	710	745	-6	99	
a_3b_1	881	800	785	822	71	109	x
a_3b_2	815	720	739	758	7	101	
a_3b_3	912	787	790	830	79	111	x
a_4b_1	900	811	782	831	80	111	x
a_4b_2	130	800	741	790	39	105	
a_4b_3	905	830	815	850	99	113	xx
Average of the experiment	801	733	718	751	mt	100	
DL 5%						60	
DL 1%						93	
DL 0,1%						120	

In all the production years there have been made observations on the generative tillers number represented in the third table that shows the following:

- the average generative tillers number /m^2 registered for the N_{90} doses is between 705-748 and there are no big differences between the nitrogen form and the way of administration<
- for the N_{120} doses, the average number of generative tillers was between 834-877 tillers /m^2 without significant differences between the variants
- the factor that most influenced the number of tillers was the year of production, so that in the first year the average number on experience was 863 tillers/m^2, in the second year decreased to 791 tillers/m^2, and in the third year was of 700 tillers/m^2.

The quality of the seed within this experience was analyzed having into consideration the dimension of the grains. The results represented in the forth table show that the studied factors in this experience have not influenced the one thousand kernel weight for *Festuca Pratensis*, the difference between the variants being very small, insignificant.

CONCLUSIONS

The fertilizer with nitrogen from amonium nitrate had the same effect on the production of seeds for the *Festuca pratensis* as the nitrogen contained in the purin.

For this species the highest level of the production has been reached for the N_{120} for both forms of nitrogen used. The full administration in the spring and in the autumn of the N_{120} has determined the biggest seed production for the fescue.

The number of generative tillers has been influenced by the fertilizer used, that has also determined the level of the production ; on the other hand the factors

studied have not influenced the dimension of the seed (one thousand kernel weight).

Table 3

The influence of the nitrogen and the administration mode upon the number of generative tillers

Variant	The generative tillers number/m^2			Average	Differences	
	2006	2007	2008		Tillers/m^2	%
a_1b_1	821	772	650	748	-37	95
a_1b_2	798	750	638	729	-56	93
a_1b_3	755	731	630	705	-80	90
a_2b_1	786	720	622	709	-76	90
a_2b_2	802	750	642	731	-54	86
a_2b_3	815	753	632	733	-52	93
a_3b_1	940	825	802	856	71	109
a_3b_2	936	855	782	858	73	109
a_3b_3	962	880	790	877	92	112
a_4b_1	950	870	728	849	64	108
a_4b_2	900	802	800	834	49	106
a_4b_3	970	856	750	859	74	109
Average	863	791	700	785	St	100

Table 4

One thousand kernel weights obtained for *Festuca pratensis* seeds

Variant	One thousand kernel weight (g)			Average
	2006	2007	2008	
a_1b_1	2.09	2.01	1.96	2.02
a_1b_2	2.00	2.10	1.95	2.02
a_1b_3	2.05	2.09	1.97	2.04
a_2b_1	2.07	2.08	1.90	2.02
a_2b_2	2.04	2.05	2.01	2.03
a_2b_3	2.06	2.06	2.03	2.05
a_3b_1	2.04	2.02	2.02	2.03
a_3b_2	2.10	2.12	2.02	2.08
a_3b_3	2.03	2.06	2.10	2.06
a_4b_1	2.13	2.07	2.12	2.11
a_4b_2	2.15	2.09	2.12	2.12
a_4b_3	2.16	2.08	2.07	2.10
Average	2.08	2.07	2.02	2.06

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