RESEARCHES REGARDING WINTER WHEAT FERTILIZATION IN THE REGION OF SALTED SOILS

CERCETĂRI PRIVIND FERTILIZAREA GRÂULUI DE TOAMNĂ ÎN ZONA SOLURILOR SALINIZATE

D.C. MICU, I. BORCEAN

Banat's University of Agricultural Sciences and Veterinary Medicine, Timişoara

***Rezumat**: Cercetările s-au efectuat în zona de vest a României, pe un sol de tip cernoziom salsodic, salinizat slab şi au vizat stabilirea eficacităţii dozelor şi a tipului de îngrăşământ cu azot, aplicat pe fond constant de P_{80}. Rezultatele evidenţiază posibilitatea creşterii recoltei de la 2400 kg/ha la peste 5000 kg/ha prin fertilizare cu N_{200}, aplicat sub formă de sulfat de aluminiu. Ambele tipuri de îngrăşăminte cu azot, în domeniul cercetat, au influenţat favorabil însuşirile ponderale ale seminţelor (MMB şi MH) cât şi conţinutul de proteină şi gluten umed.*

***Abstract:** The researches have been done in the western part of Romania, on a salsodic chernozem soil, poorly salted, and had as goal to establish the doses' efficiency and the type of nitrogen fertilizer used on a constant base of P_{80}. The results show the possibility of yield increase from 2400 kg/ha to over 5000 kg/ha, by fertilizing with N_{200}, used as aluminum sulfate. Both types of nitrogen fertilizers have positively influenced the ponderal characteristics of the grains and of (MMB and MH) as well as the protein and wet gluten content.*

***Key words:** winter wheat, fertilization*
***Cuvinte cheie:** grâu de toamnă, fertilizare*

INTRODUCTION

The fertilization with nitrogen fertilizers on a base of phosphorous and potassium leads to important increase of crops and to the bettering of the winter wheat quality on all types of soil. The researches done had as aim to establish the doses and the type of nitrogen fertilizer and its influence on the yield, on the ponderal characteristics of the grains, and on the protein and wet gluten content under the conditions of the slated soils in the region Sânmartin – Buzias.

MATERIALS AND METHODS

The variety used for the experiments was Alex, a variety very often cultivated in the mentioned area. The experiments were bifactorial, the A factor being the type of nitrogen fertilizer (ammonium nitrate and ammonium sulfate), and the B factor the doses of nitrogen used on a base of N_{80}, N_{100}, N_{150}, N_{200}. The precursory cultivated plant was the maize cultivated for its grains. The technology applied for this crop was the usual one, but there must be mentioned that at seeding there has been used a density of 500 kg/m^2.

RESULTS AND DISCUSSIONS

In Table 1 the results obtained are given, which varied for the researched area between 2400 kg/ha and 5200 kg/ha. The use of ammonium sulfate has increased the yield with 5% as compared to the use of ammonium nitrate. This happened both due to the strong acid reaction of the ammonium sulfate and to the supply of sulphur to the salted soil on which there has been worked. The nitrogen fertilizers increased the yield with over 800 kg/ha for a doses of N_{50}, and with over 1700 kg/ha for a doses of N_{100}, with over 2300 kg/ha when fertilizing with N_{150} and

with over 2500 kg/ha when fertilizing with N_{200}. In Table 2 are given the balanced characteristics MMB and MH favorably influenced by the doses of fertilizer.

Table 1

The yield results obtained for the winter wheat

The A factor The type of nitrogen fertilizer	The B factor – the doses of N on a base of P_{80}					The averages of the A factor			
	N_0	N_{50}	N_{100}	N_{150}	N_{200}	Yield Kg/ha	%	Difference Kg/ha	Signification
Ammonium nitrogen	2430	3265	4096	4625	4800	3843	100		
Ammonium sulfate	2430	3361	4201	4932	5212	4027	105	184	XXX

DL 5% = 95 kg/ha DL 1% = 127 kg/ha DL 0.1% = 168 kg/ha

Specification	N_0	N_{50}	N_{100}	N_{150}	N_{200}
Yield kg/ha	2430	3313	4148	4778	5006
%	100	136	171	197	206
Difference kg/ha		883	1718	2348	2576
Signification		XXX	XXX	XXX	XXX

DL 5% = 214 kg/ha DL 1% = 286 kg/ha DL 0.1% = 375kg/ha

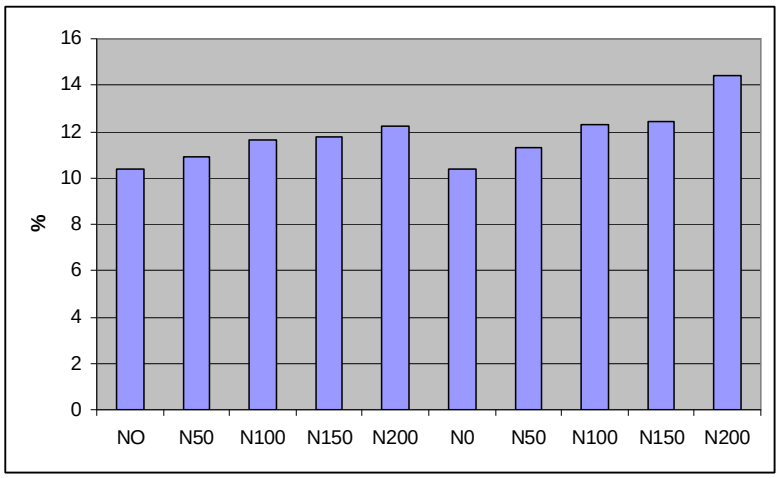
Table 2

The ponderal characteristics (MMB and MH)

Ponderal characteristic	Type of fertilizer	Doses of N				
		N_0	N_{50}	N_{100}	N_{150}	N_{200}
MMB	NO_3NH_4	39.0	41.2	43.5	44.4	44.8
	$(NH_4)_2SO_4$	39.0	42.3	44.1	46.4	47.3
MH	NO_3NH_4	78.6	79.8	80.6	80.8	81.1
	$(NH_4)_2SO_4$	78.6	80.7	80.9	80.9	81.3

Therefore, MMB increased from 39.0 g to 44.8g in the variant fertilized with N_{200} used in form of ammonium sulfate. The hectolitre mass increased together with the N doses from 78.6 kg/hl to over 81kg/hl in the variant N_{200}. The protein content is given in fig. 1, and the gluten content in fig. 2.

It results that in the researched area the protein content increased from 10.4% (N_0) to 12.2% (N_{200}) in the variants fertilized with ammonium nitrate and from 10.44% (N_0) to 14.43% $N_{(200)}$ in the variants fertilized with ammonium sulfate. This tendency has been also shown in the case of the wet gluten content, which increased from 19.65% (N_0) to 28.75% (N_{200}) in the variant fertilized with ammonium nitrate and to 30.93 % (N_{200}) when using ammonium sulfate.



Protein content	10.4	10.9	11.65	11.77	12.2	10.4	11.32	12.31	12.46	14.43
Difference (%)		0.50	1.25	1.37	1.80		0.92	1.91	2.06	4.03
X	11.36					12.18				
Difference (%)						0.82				
Specification	Ammonium nitrate					Ammonium sulfate				

Fig. 1. The raw protein content (%) according to the type of nitrogen fertilizer and to the used doses

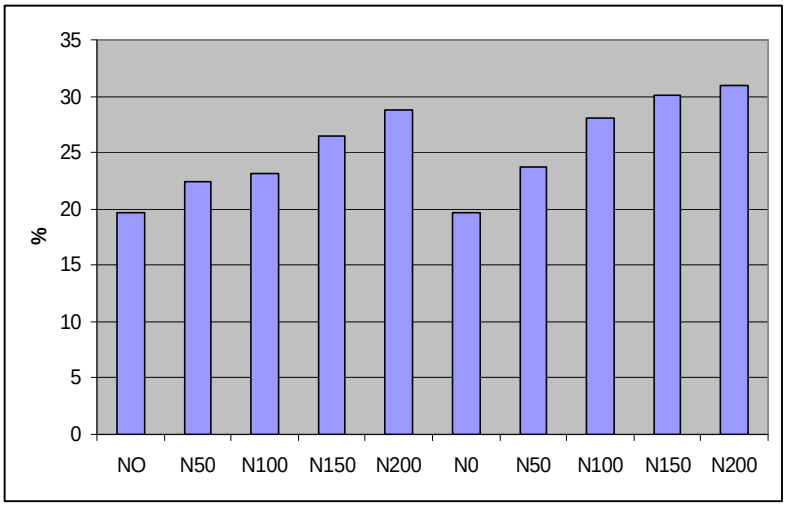


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Fig. 1. The wet gluten content (%) according to the type of nitrogen fertilizer and to the used doses

CONCLUSIONS

In the case of the salsodic chernozem poorly salted, the use of nitrogen fertilizers in form of ammonium sulfate ensures the increase of yield with 50% as compared to use of the same doses of fertilizer, but in form of ammonium nitrate.

The protein and wet gluten content in the studied area were positively influenced by using nitrogen fertilizers, the most important increases being noticed for the variants of fertilization with ammonium sulfate.

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