

RESEARCH REGARDING THE BEHAVIOUR OF SPELTA WHEAT (*Triticum aestivum* L., ssp. *spelta*) IN THE BANAT PLAIN

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Abstract: Researches have been done in the Foeni area, on a black and humid soil type, that is in an iron oxides reduction process, with a weak acid reaction in the surface horizon (with a moderate content of nitrogen and phosphorus and a high content of potassium). In this study are presented the results obtained on the Spelta Oberkulmer Rotkorn type of wheat, in comparison with the commune Alex type of wheat, which were obtained in different nitrogen fertilization conditions, on a constant content of $P_{80}K_{80}$. The harvests in the researched domain have varied between 4800 kg/ha and 5600 at the Alex type of wheat and between 4200 kg/ha and 5100 kg/ha at the Oberkulmer Rotkorn type. There have been measurements made concerning the length of the ear, the number of grains per ear and the weight of the grains per ear. The length of the ears has grown, by doubling the dose of nitrogen, from N_{50} to N_{100} , from 9,08 cm to 9,55 cm at the *Triticum aestivum spelta* type. The number of spikelets per ear at the *Triticum aestivum vulgare* type has grown from 19,80, at a nitrogen dose of N_{50} to 21,20, at a nitrogen dose of N_{100} and at the *Triticum aestivum spelta* type it has grown from 18,70 (N_{50}) to 19,20 (N_{100}). The number of grains per ear has grown at the *Triticum aestivum vulgare* type from 34,60 (N_{50}) to 37,50 (N_{100}) and at the *Triticum aestivum spelta* type it has grown from 31,40 (N_{50}) to 34,40 (N_{100}). The weight of grains per ear has grown, by doubling the dose of nitrogen, from 1,04g to 1,16g at the *Triticum aestivum vulgare* type and from 1,01g to 1,10g at the *Triticum aestivum spelta* type. The researches are important because the valorification price of the spelta wheat, on the global market, is at least double as much as the price of the commune wheat and the population benefits of a great variety of products

Key words: wheat, *Triticum aestivum* ssp. *spelta*, fertilization.

INTRODUCTION

Its high crop presence and its special alimentary importance motivate the attention this plans was given by over 100 countries of the world.

Alter a long period of time of being wheat exporter, as the cultivated land decreases and the wheat crops are situated much under the ones obtained by other cultivating countries, having less favourable pedoclimatic conditions as compared to the ones in our country, Romania does not manage anymore to cover not even its own necessities, which has important consequences upon our country's economy.

A new aspect which appeared on the world market in the last years is the growing need of specialists in the field of panification for varieties which are not cultivated anymore, such as *Triticum monococcum* L. ssp. *monococcum* și *Triticum aestivum* ssp. *spelta* L., a fact which motivates the present research.

MATERIALS AND METHODS

The researches were carried out on a moderate gleyed cambic vertic chernozem, having a low acid reaction at the surface, medium supplied with nitrogen, phosphorus and potassium, situated in Câmpia Banatului (Banat's Plain), on Foeni territory.

The experiments were bifactorial, organized according to the subdivided plots method, there were done three repetitions, the A factor with two graduations being represented by the cultivated biological material (the Alex variety of *Triticum aestivum* ssp. *vulgare* and

the Oberkulmer rotkorn variety of *Triticum aestivum ssp. spelta*), and the B factor being represented by the nitrogen doses (N₅₀ and N₁₀₀) applied on a constant base of P₈₀K₈₀.

RESULTS AND DISCUSSIONS

The crop results obtained according to the phenotype and fertilization are presented in Table 1.

Table 1

The wheat yield according to genotype and fertilization

A Factor genotype	C Factor fertilization		The averages of the A factor			
	N ₅₀ P ₈₀ K ₈₀	N ₁₀₀ P ₈₀ K ₈₀	Yield kg/ha	%	Difference kg/ha	Signification
<i>Triticum aestivum ssp. vulgare</i>	4850	5516	6183	100		
<i>Triticum aestivum ssp. spelta</i>	4218	5080	4649	90	-543	000

DL 5%=142 kg/ha DL1%= 193 kg/ha DL0,1%= 260 kg/ha

The averages of the B factor

Specification	N ₅₀ P ₈₀ K ₈₀	N ₁₀₀ P ₈₀ K ₈₀
Yield kg/ha	4534	5298
%	100	117
Difference kg/ha		764
Signification		xxx

DL 5%=206 kg/ha ; DL1%= 325 kg/ha ; DL0,1%=420 kg/ha

It results that the yield result for spelta wheat was 10% lower, respectively with over 500 kg/ha under the yield result obtained for common wheat.

The two wheat varieties positively valued the doubled nitrogen doses. As a result, the average yield increase was of 17%, the yield difference being of over 700 kg/ha, a very significant difference.

To underline is the fact that the spelta wheat variety proved itself to be adapted to the region, that it has good panification properties (the protein content being of 13% and that of the wet gluten of 28%). The variety proved itself wintering, falling, drought and diseases resistant.

The double price for yield processing proves that, although the yield was ca. 500 kg/ha lower than the one of common wheat cultivated in the region, which is the Alex variety, the profit gained by cultivating the spelta wheat ist higher.

Fig. 1, 2, 3 and 4 present the biometric measurement results regarding the main productivity characteristics. The results show that on a constant base of P₈₀K₈₀, a double nitrogen doses favourably influences the ear's length, the number of little ears/ear, the number of grain /ear and the grains' mass /ear.

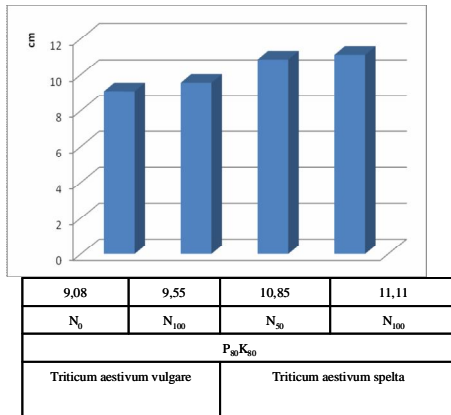


Fig. 1 The era's length

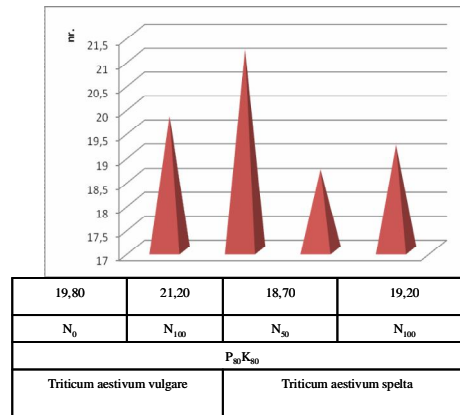


Fig. 2. The number of little ears /ear

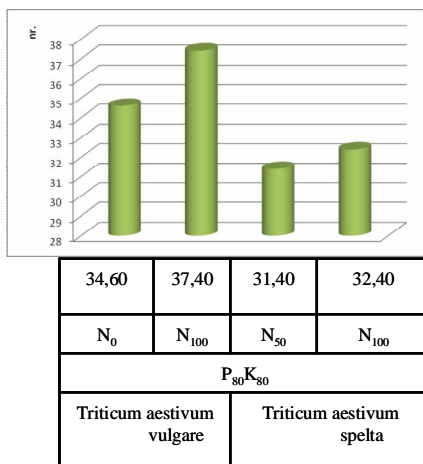


Fig. 3. The number of little ears /ear

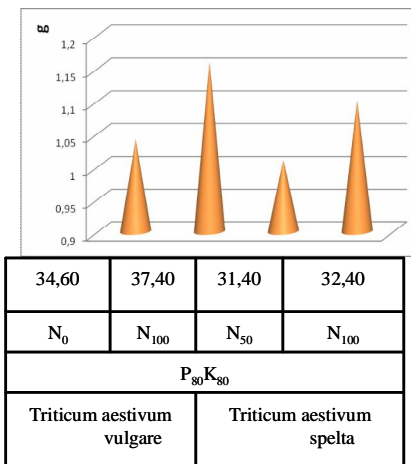


Fig. 4. The ear's weight /ear

CONCLUSIONS

1. The Oberkulmer rotkorn wheat variety of *Triticum aestivum ssp. spelta* produces yields of 4 – 5 t/ha which can be care valued at a double price as compared to the common wheat.

2. By doubling the nitrogen fertilizer doses from N₅₀ to N₁₀₀, applied on a base of P₈₀K₈₀, the yield result in the analyzed region increases with over 700 kg/ha, which means about 15 kg grains/1 kg N.

3. The ear's length increased when doubling the nitrogen doses from N₅₀ to N₁₀₀ to 9,08 cm la 9,55 cm for *Triticum aestivum spelta*. The number of little ears /ear increased for *Triticum aestivum vulgare* from 19,80 for the variant N₅₀ to 21,20 for the variant N₁₀₀, and for *Triticum aestivum spelta* from 18,70 (N₅₀) to 19,20 (N₁₀₀). The number of grains / ear for *Triticum aestivum vulgare* increased from 34,60 for the N₅₀ variant to 37 for the N₁₀₀ variant and for *Triticum aestivum spelta* from 31,40 (N₅₀) to 32,40 (N₁₀₀), and the grains' weight /ear

increased from 1,04 to 1,16 g for *Triticum aestivum vulgare* and from 1,01 g to 1,10 g for *Triticum aestivum spelta* by doubling the nitrogen doses.

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