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THE EFFECT OF SEEDING RATES ON GRAIN YIELD OF SPRING BARLEY IN SYSTEM WITHOUT TILLAGE

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Summary

The field treatments were carried out on two experimental places of Research Institute of Agroecology Michalovce. The influence of various seeding rates on the spring barley yield was observed in these small – plot field experiments during 1996 – 1997. On the average, the first seeding rate (4 mil. grains per hectare) gave the highest yield production in conditions of Fluvi-eutric Gleysol (5,16 t.ha^{-1}) and the second seeding rate (5 mil grains per hectare) gave the highest yield production in conditions of Eutric Fluvisol (5,19 t.ha^{-1}). Presented data showed that the highest seeding rate do not assure the highest grain yield production of spring barley.

Key words: spring barley, grain yield, seeding rates

Introduction

For normal growing and development must have each plant own vegetational space. The vegetational space is determined by spacing and by seeding rate. When the stand density is very high the intraspecific competition is very high too and nutritional space for every plants is very small. The weed infestation rate is very intensive in the thin stands and the density of productive culm (ears. m^{-2}) is not optimal. Optimal stand density is in interrelation with seeding rate and it is influenced by more factors: sort and variety of plant, soil and climatic conditions, forecrop, depth and time of sowing, quality of sowing and quality of seed. The aim of experiment was to evaluate the influence of seeding rates on spring barley yield production.

Material and methods

The field treatments were carried out on two experimental places of Research Institute of Agroecology Michalovce. The influence of various seeding rates on the spring barley yield was observed in these small – plot field experiments during 1996 - 1997. Spring barley variety Sladko was cultivated on the Eutric Fluvisol (Vysoká nad Uhom) and on the Fluvi – eutric Gleysol (Milhostov) in the climatic conditions of the East-Slovakia Lowland. Spring barley followed after sugar beet in the crop rotation and grown in natural conditions without irrigation. The experiment was conducted to study the effect of two seeding rates (4 million grains per hectare and 5 million grains per hectare) on production of spring barley grown in condition without tillage.

Results and discussion

The quantitative parameters of spring barley were dependent from different seeding rates. The grain yield of spring barley were moved in the range 5,37 – 4,91 t.ha^{-1} (fig 1 and 2).
On the average, the first seeding rate (4 mil. grains per hectare) gave the highest yield production in conditions of Fluvi-eutric Gleysol (5,16 t.ha^{-1}) and the second seeding rate (5 mil grains per hectare) gave the highest yield production in conditions of Eutric Fluvisol (5,19 t.ha^{-1}). The importance of seeding rates has been reflected in experimental years, in our case, in favour of lower seeding rate by 0,07 t.ha^{-1} on two years average in conditions of Fluvi-eutric Gleysol and in favour of higher seeding rate by 0,1 t.ha^{-1} on two years average in conditions of Eutric Fluvisol.
The results indicated that the seeding rates had not statistically significant effect on grain yield. Higher seeding rate gave the similar grain yield comparing to the lower seeding rate on both of soil types (table 1). The results also indicated that there was not statistically significant difference between both of seeding rates which were compared in field experiment (table 2).
The aim of experiment was to evaluate the influence of seeding rates on spring barley yield production. There were two different seeding rates (4 and 5 mil. grain per hectare) and presented data showed that the highest seeding rate do not assure the highest grain yield production of spring barley. Similarly results published Dudáš (1991), Moustafa, Refay, (1998) and Míša (2001).

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Table 1: Evaluation of spring barley grain yield (t.ha^{-1}) by analysis of variance.

Studied factor	Degrees of freedom	Mean of squares	F-test	Probability	Significance
Years	1	0,0114761	2,958	0,2054	-
Soil	1	0,0013261	0,300	0,6273	-
Seeding rates	1	0,0172980	3,917	0,1422	-
Residual	3	0,0132498			
Total	31	1,4463329			

Table 2: Evaluation of spring barley grain yield (t.ha^{-1}) by LSD test.

Studied factors		Count	95 percent LSD		
			Mean	Homogenous groups	
Years	1996	16	5,0963750	X	
	1997		5,1342500	X	
Soil	*Eutric Fluvisol*	16	5,1088750	X	
	Fluvi-Eutric Gleysol		5,1217500	X	
Seeding rates	4 mil. grains per hectare	16	5,0920625	X	
	5 mil. grains per hectare		5,1385625	X	

Fig 1: Spring barley grain yield grown in conditions of the Eutric Fluvisol (Vysoká nad Uhom), according to the seeding rate.

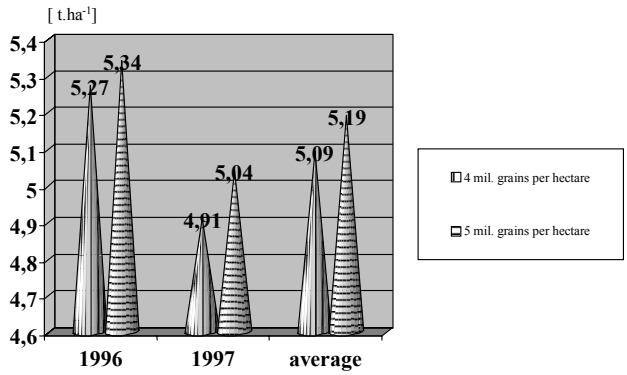

Fig 2: Spring barley grain yield grown in conditions of the Fluvi-Eutric Gleysol (Milhostov), according to the seeding rate.