

one inter-generic hybrid "HŽ 12DK" (30,69 t.ha⁻¹). Achieved hay yield of dry matter were confirmed the high productive parameters of inter-generic hybrids and their good representative device to clover grass mixtures, that is consisted with results by Volosin et al. (1997). The notions for suitable of their exploitation in condition of the East-Slovakian Lowland were confirmed too (Gejguš, Kováč 1997) not only in the field trial, but also at large-scale production of condition at agricultural farms Tušice, Nižný Hrušov, Staré and Choňkovce.

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THE INFLUENCE OF NUTRITION ON THE CHANGES OF QUANTITATIVE AND QUALITATIVE PARAMETERS OF SUGAR BEET

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Summary

The influence of fertilization on the changes of quantitative and qualitative parameters of sugar beet cultivation was observed in the yield stationary experiments accomplished in 1996–1998 on the Eutric Fluvisol and Fluvi - Eutric Gleysols. The problems was followed at the variety Ibis on the followed variants of fertilization: 1st-method of balance, 2nd-method of electro-ultrafiltration, 3rd-variant without fertilization. The quantitative and qualitative parameters of roots were statistically significantly dependent from variant of fertilization, soil types and year of cultivation. The effect of fertilization was reflected in increasing root yield from 9,34 to 9,78 t.ha⁻¹, the production of polarizing sugar from 1,26 to 1,66 t.ha⁻¹ and the production of refined sugar from 0,51 to 0,96 t.ha⁻¹ in comparison to the control without fertilization. The higher digestion and refined sugar yield were obtained at the 2nd and 3rd variants. At reciprocal comparison of fertilizing variants were higher yield and superior qualitative parameters roots were found on the 2nd variant.

Keywords: sugar beet; fertilization; root yield; digestion; ash; α -amino N; refined sugar yield; production of polarizing sugar; production of refined sugar

Introduction

The nutrition and fertilization of sugar beet are specific because they have to ensure not only high yield but as well as suitable the qualitative parameters. Realized of fertilization system must be economic advantageous and has to hold the nature soil fertility.

The sugar beet fertilization is made by the methods which may be to save the harmony relations between nutriment in soil environment and their requirement of stand (KOVÁČOVÁ, 1997; ŠOLTYSOVÁ, 1999). To control of fertilization is important because high offer of the soil nutrition lower qualitative parameters of sugar beet. The fertilization of nitrogen lower digestion root of sugar beet and it cause increase nitrogenous matter and ashes.

The aim of the contribution presented was to evaluate the influence of rationally fertilization on the quantitative and qualitative parameters of sugar beet cultivated on the soils of East Slovakian Lowland.

Material and methods

The problems of sugar beet nutrition was followed in years 1996–1998 by stationary experiments of Research Institute of Agroecology in the condition of Eutric Fluvisol (EF) in Vysoká nad Uhom and Fluvi-Eutric Gleysols (FEG) in Milhostov. The detailed characteristic of the place is described in the thesis of Šoltysová (1999).

The sugar beet variety Ibis was grown in the crop rotation at the traditional tillage. The forecrop of sugar beet was winter wheat. The quantitative and qualitative parameters of sugar beet were observed at three different variant of nutriment: 1st-method of balance, 2nd-method of electro – ultrafiltration, 3rd-variant without fertilization.

Sugar beet was rationally fertilized. The average doses of industrial fertilizers are shown in the table 1. The quantitative and qualitative parameters of sugar beet were followed at the 1st - 3rd variants. The qualitative parameters roots were determined by the analytical methods. The obtained results were evaluated statistically by the analysis of variance and are shown in the tables.

Results and discussion

The quantitative and qualitative parameters of sugar beet were dependent from different system of fertilization. The root yield moved in the interval of 53,80 to 79,33 t.ha⁻¹ (table 2). The root yield was statistically significantly dependent from variant of fertilization, soil types and year of cultivation. On the fertilization variants were obtained significantly higher yield of roots over from 9,34 to 9,78 t.ha⁻¹ in comparison to control without fertilization. The positive influence of fertilization on the yield of sugar beet was also pointed STRNAD (1995).

Significantly the highest yield were obtained in the 1996. In this year were best climatic conditions for cultivation of sugar beet. The lowest yield of sugar beet were obtained in the 1998, when plenty of areas sugar beet were wet in the East Slovakian Lowland.

The nutrition of sugar beet together with weather are factors significantly influence to technological quality roots. The qualitative parameters roots of sugar beet (digestion, ash content, α -amino N, refined sugar yield) are shown in the table 3. The digestion of sugar beet were moved in the range 14,50 – 20,20 %. Significantly higher digestion were obtained at the 2nd and 3rd variants.

Table 1 Average doses of fertilizers for sugar beet

Variant of fertilization	EF				FEG			
	N - 1 kg.ha ⁻¹	N - 2 kg.ha ⁻¹	P kg.ha ⁻¹	K kg.ha ⁻¹	N - 1 kg.ha ⁻¹	N - 2 kg.ha ⁻¹	P kg.ha ⁻¹	K kg.ha ⁻¹
1 st	93,2	26,7	29,3	104,7	82,7	35,0	28,0	115,0
2 nd	44,5	30,0	33,7	113,0	40,0	33,3	47,4	116,7
3 rd	-	-	-	-	-	-	-	-

Where: N - 1 = fertilization before sowing, N - 2 = nutrition by foliar application

Table 2: Quantitative parameters of sugar beet (t.ha⁻¹)

Variant of Fertilization	Year	Root yield		Production of polarizing sugar		Production of refined sugar	
		EF	FEG	EF	FEG	EF	FEG
1 st	1996	79,33	75,20	15,07	10,90	12,667	8,97
	1997	70,19	65,50	12,07	11,14	10,270	9,31
	1998	66,13	68,04	10,75	10,82	9,064	8,72
	Average	71,88	69,58	12,63	10,95	10,67	9,00
2 nd	1996	78,00	74,60	15,13	10,97	13,07	8,91
	1997	72,06	66,08	13,26	11,56	11,50	9,81
	1998	68,70	67,54	11,23	11,08	9,30	9,10
	Average	72,92	69,41	13,17	11,20	11,29	9,27
3 rd	1996	70,15	64,80	14,17	10,17	12,48	8,60
	1997	64,30	53,80	10,93	9,58	9,23	8,04
	1998	59,15	56,14	9,76	8,56	8,05	6,89
	Average	64,53	58,25	11,62	9,44	9,92	7,84

Table 3 Qualitative parameters of sugar beet

Variant of Fertilization	Year	Digestion (%)		Ash content (%)		α -amino N (mmol.100g ⁻¹)		Refined sugar yield (%)	
		EF	FEG	EF	FEG	EF	FEG	EF	FEG
1 st	1996	19,00	14,50	0,558	0,442	3,57	4,28	15,968	11,932
	1997	17,20	17,00	0,442	0,498	4,28	4,64	14,632	14,208
	1998	16,25	15,90	0,436	0,573	2,86	3,11	13,706	12,808
	Average	17,48	15,80	0,479	0,504	3,57	4,01	14,769	12,983
2 nd	1996	19,40	14,70	0,460	0,490	3,21	5,35	16,760	11,940
	1997	18,40	17,50	0,412	0,462	3,57	4,11	15,952	14,852
	1998	16,35	16,40	0,502	0,533	3,03	3,07	13,542	13,468
	Average	18,05	16,20	0,458	0,495	3,27	4,18	15,418	13,420
3 rd	1996	20,20	15,70	0,403	0,406	3,21	4,28	17,788	13,276
	1997	17,00	17,80	0,460	0,516	4,28	4,46	14,360	14,936
	1998	16,50	15,25	0,524	0,546	2,86	3,39	13,604	12,266
	Average	17,90	16,25	0,462	0,489	3,45	4,04	15,251	13,493

Content of soluble ash was moved in the range 0,403 - 0,573 %, α -amino nitrogen 2,86 - 5,35 mmol.100 g⁻¹ and refined sugar yield 11,932 – 17,788 %. Also values of these parameters were dependent from variant of fertilization, soil types and the year of cultivation.

The influence climatic condition is reflected not only in yield roots but at the values qualitative parameters of sugar beet too. These results are in the harmony with literature (Pačuta, Černý, Karabínová, 2001).

Production of polarizing sugar and production of refined sugar is shown in table 2. The fertilization of sugar beet caused the average increase of the production of polarizing sugar from 1,26 to 1,66 t.ha⁻¹ and of the production of refined sugar from 0,51 to 0,96 t.ha⁻¹ in comparison to the control without fertilization.

At reciprocal comparison of fertilizing variants were higher yield and superior qualitative parameters roots were found on the 2nd variant (method of electro-ultrafiltration).

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INFLUENCE OF TILLAGE SYSTEMS ON SOIL MOISTURE DYNAMICS UNDER WINTER WHEAT CULTIVATION.

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Summary

The soil moisture by different cropping systems and conventional and reduced soil tillage management have been evaluated at Ortíc Luvisol near Nitra during 1998–2000. The soil moisture in soil profile under winter wheat canopy was determined to the depth 0.6 m with 0.1 m interval layers by gravimetric analysis at different cropping systems. No significant differences in soil moisture between evaluated conventional and reduced tillage treatments have been noted. The average soil moisture was in range 14.28 – 15.99% (conventional) and 14.30 – 16.12% (reduced) in favour of shallow loosening. The seasonal dynamics of soil moisture in spite of different rainfall characters within the space of three years was very similar. The significant differences between date of sampling during vegetation period and years were determined.

Keywords: soil moisture, tillage management, winter wheat.