RESEARCHES REGARDING THE SOWING TECHNOLOGY FOR A RANGE OF POPCORN BIOTYPES

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Abstract: *Porumbul pentru floricele Zea mays L., conv. Everta Sturt, sin. microsperma Körn, este una din cele mai vechi forme cultivate, care însă din cauza productivităţii scăzute se cultivă pe suprafeţe reduse, fiind utilizat pentru crupe şi floricele. Varietăţile aparţinând acestei convarietă□i determinate de Körn sunt oryzoides, xanthornis şi axyornis din grupa varietăţilor cu boabe roşcate şi leucornis, gracillina haematornis şi melanornis, din grupa varietăţilor partea coronară a boabelor rotunjită. În catalogul oficial al soiurilor (hibrizilor) din România nu sunt menţionate soiurile sau hibrizi zonaţi, considerent pentru care în stadiul efectuat sunt studiate provenienţe din trei zone din România, (Turda, De Bărăgan şi De Jebel), o provenienţă din Ungaria (Kesclemeri) şi un soi din USA (Little jewels). Lucrarea cuprinde date referitoare la stabilirea perioadei de semănat la cele cinci biotipuri şi rezultate referitoare la influenţa desimii plantelor asupra recoltei de boabe. Cercetările s-au efectuat pe un sol de tip cernoziom tipic freatic umed cu salinizare slabă sub 100 cm, din Câmpia Timişului..În lucrare sunt prezentate rezultatele care arată superioritatea semănatului devreme, în prima decadă a lunii aprilie când recolta medie a celor cinci biotipuri a fost mai mare cu 11% faţă de semănatul în ultima decadă a lunii aprilie. Dintre biotipuri s-a remarcat Turda la care recolta medie pe cele două perioade de semănat a fost peste 4900 kg/ha. Desimea optimă a fost de 50.000 plante recoltabile/ha. Mărirea desimii la 60.000 plante recoltabile/ha a redus recolta cu 7%, iar mărirea desimii la 70.000 plante/ha a redus recolta cu 12%. În lucrare sunt prezentate rezultatul privind influenţa factorilor cercetaţi asupra numărului de ştiuleţi pe plantă, a procentului de plante sterile şi a randamentului de boabe. Zea mays L. popcorn, conv. Everta Sturt, sin. microsperma Körn, is one of the oldest cultivated form which, because of its reduces productivity, is cultivated on reduces surfaces being used for mixed cereals and pop corn. The varieties belonging to this convariety determined by Körn are oryzoides, xanthornis and axyornis of the group with reddish grains, and leucornis, gracillina haematornis and melanornis of the group with rounded coronary part of the grains. No zoned varieties or hybrids are mentioned in the official catalogue of the varieties (hybrids) of Romania, which is why up to this stage only varieties originating from three zones of Romania (Turda, Bărăgan and Jebel), one of Hungary (Kesclemeri) and one of the USA (Little jewels) are studied. The paper contains data referring to sowing period determination for the five biotypes and the results regarding the plant density influence upon the grain yield. The researches were conducted on a typical wet-phreatic chernozem with poor salinization under 100 cm, situated in the Timiş Plain region. The paper presents the results showing the superiority of early sowing, in the first decade of April, when the average yield for the five biotypes was 11% bigger than the yield obtained .When sowing in the last decade of April. Among the biotypes the best has proven to be the Turda biotype, with an average yield for the two sowing periods of more than 4900 kg/ha. The optimal density was of 50.000 harvestable plants/ha. The density increase to 60.000 harvestable plants/ha reduced the yield with 7%, and the density increase to 70.000 plants/ha reduced the yield with 12%.. The paper presents the result of the influence the researched factors had on the number of corn cobs per plant, on the percentage of sterile plants and on the grain output.*

Key words*: Zea mays everta Strt – sowing technology*

INTRODUCTION

The researches done on popcorn regarding the behaviour f the cultivated biotypes and on the sowing technology in Romanian are only few, the demands for this convariety are very

small on the market and, as a result, the surfaces cultivated are very restricted and not mentioned in the Statistic Year Books.

That is why some of the sowing technology aspects (sowing period and cultivation density) have been considered in this paper for five popcorn varieties, under the cultivation conditions of the most favourable region for the cultivation of this plant, which is the Western Plain of Romania.

MATERIAL AND METHODS

Two bifactorial experiments with three repetitions have been organized in order to give an answer to the above mentioned problems.

In the experiment which had as object the determination of the sowing period the A factor was represented by sowing period, with two graduations, the period April 5 – 10 and April 25 – 30, and the B factor referred to the studied biotypes, with five graduations: Turda, Jebel, Bărăgan, Kesckemeti and Little jewels.

The second experiment had as A factor the plant density on field, with three graduations, 50.000; 60.000 and 70.000 plants/ha, and as B factor the five mentioned biotypes.

The previous culture was the autumn wheat. The fertilization was done with 20 t/ha manure $+P_{60}$.

RESULTS AND DISCUSSIONS

Table 1 presents the yield results. They show that, by delaying the sowing from the first decade of April to the last decade of the same month, the average yield of the five biotypes reduced with 767 kg/ha.

There can be noticed that, from all studied biotypes, Turda had an average yield of 4960 kg/ha per sowing period, exceeding by far the yields of all the other biotypes.

Table 1

The grain yield obtained for popcorn according to the sowing period

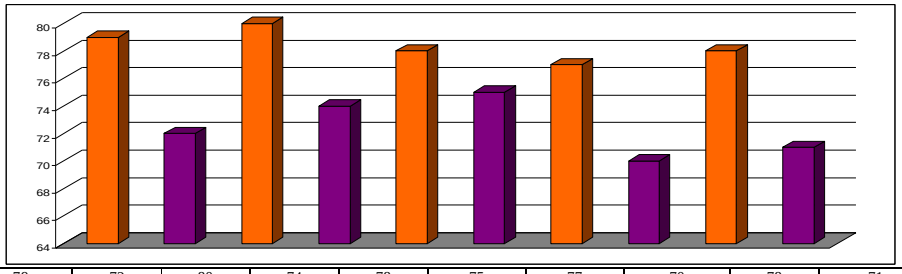
A Factor	B Factor					A Factor Averages			
	Turda	Jebel	Bărăgan	Kesckemeti	Little jewels	Yield kg/ha	%	Difference kg/ha	Signification
A_1 5-10IV	5320	4380	4558	3644	3705	4321	100		
A_2 25-30IV	4600	3747	4205	3302	3420	3854	89	-467	00

DL5% = 278 kg/ha DL1% = 390 kg/ha DL 0,1% = 551 kg/ha

B factor averages

Specification	Turda	Jebel	Bărăgan	Kesckemeti	Little jewels
Yield kg/ha	4960	4063	4381	3473	3562
%	100	81	88	70	71
Difference kg/ha		-897	-579	-1487	-1398
Signification		000	000	000	000

DL5% = 124 kg/ha DL1% = 174kg/ha DL 0,1% = 246 kg/ha



79	72	80	74	78	75	77	70	78	71
5-10 IV	25-30 IV	5-10 IV	25-30 IV	5-10 IV	25-30 IV	5-10 IV	25-30 IV	5-10 IV	25-30 IV
TURDA		JEBEL		BARAGAN		KESCKEMETI		LITTLE JEWELS	

Figure 1 The grain output according to the sowing period for 5 popcorn biotypes

The grain output (figure 1) varied between 70% and 80% in the researched area.

Table 2 presents the yield results according to the sowing density, obtained for the five studies biotypes.

Table 2

The grain yield obtained for popcorn, according to the plant density for the 5 biotypes

A Factor	B Factor					A Factor averages			
	Turda	Jebel	Bărăgan	Kesckemeti	Little jewels	Yield kg/ha	%	Difference kg/ha	Signification
50.000	5180	4294	4548	3668	3533	4244	100		
60.000	4709	4095	4229	3413	3477	3984	93	-260	
70.000	4419	3673	4050	3333	3351	3765	88	- 479	00

DL5% = 267 kg/ha DL1% = 374 kg/ha DL 0,1% = 529 kg/ha

B Factor Averages

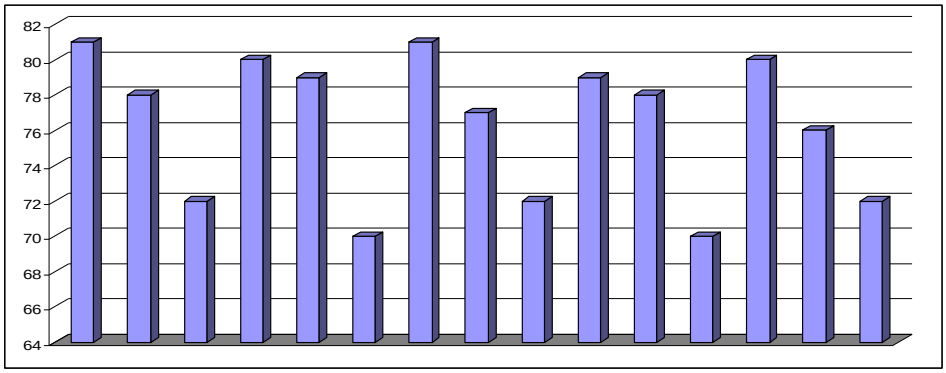
Specification	Turda	Jebel	Bărăgan	Kesckemeti	Little jewels
Yield kg/ha	4769	4020	4275	3471	3453
%	100	84	89	72	72
Difference kg/ha		-749	-494	-1298	-1316
Signification		000	000	000	000

DL5% = 119 kg/ha DL1% = 167kg/ha DL 0,1% = 236 kg/ha

It results that, by increasing the density from 50.000 plants/ha to 60.000 plants/ha the average yield for the five biotypes decreased with 7% and by increasing the density to 70.000 plants/ha the yield decrease was of 12%.

The Turda, Jebel and Bărăgan biotype yield was of more than 4000 kg/ha and the Kesckemeti and Little biotype yield was of between 3400 and 3500 kg/ha.

Figure 2 presents the grain output which varied between 70 g and 81 g in the researched area.



81	78	72	80	79	70	81	77	72	79	78	70	80	76	72
50-000 plants/ha	60-000 plants/ha	70-000 plants/ha	50-000 plants/ha	60-000 plants/ha	70-000 plants/ha	50-000 plants/ha	60-000 plants/ha	70-000 plants/ha	50-000 plants/ha	60-000 plants/ha	70-000 plants/ha	50-000 plants/ha	60-000 plants/ha	70-000 plants/ha
TURDA			JEBEL			BĂRĂGAN			KESCKEMETI			LITTLE JEWELS		

Figure 2 Grain output depending on the cultivation density for the 5 popcorn biotypes

CONCLUSIONS

The technological species experimented in Timiș Plain, on a cambic wet-phreatic chernozem with poor salinization, underlines the fact that the sowing period and the plant

density significantly influence the popcorn grain yield.

The average yield of the five biotypes decreased with 11% by delaying the sowing from the frost decade of the month.

The plant density increase from 50.000 plants/ha to 60.000 plants/ha reduced with 7% the average yield of the five biotypes and the density increase to 70.000 plants/ha reduced the grain yield with 12%.

Turda, Bărăgan and Jebel biotypes convinced with yields of between 4000 and 5000 kg/ha, followed by Kesckemeti and Little jewels with yields of between 3400 and 3500 kg/ha.

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