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 productivității scăzute se cultivă pe suprafețe reduse, fiind utilizat pentru crupe și floricele. Varietățile aparținând acestei convariatii determinate de Körn sunt oryzoides, xanthornis și axyornis din grupa varietăților cu boabe roșcate și leucornis, gracillina haematornis și melanornis, din grupa varietăților partea coronară a boabelor rotunjită. În catalogul oficial al soiurilor (hibrizilor) din România nu sunt menționate soiurile sau hibrizi zonați, considerent pentru care în studiul efectuat sunt studiate proveniențe din trei zone din România, (Turda, De Bărăgan și De Jebel), o proveniență din Ungaria (Kesclemeri) și un soi din USA (Little jewels). Lucrarea cuprinde date referitoare la stabilirea perioadei de semănat la cele cinci biotipuri și rezultate referitoare la influența 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 Timișului. În lucrare sunt prezentate rezultatele care arată superioritatea semănăturii devreme, în prima decadă a lunii aprilie când recolta medie a celor cinci biotipuri a fost mai mare cu 11% față de semănătatea în ultima decadă a lunii aprilie. Dintre biotipuri s-a remarcat Turda la care recolta medie pe cele două perioade de semănătate 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 rezultatele privind influența factorilor cercetății asupra numărului de ștuleți pe plantă, a procentului de plante sterile și 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 reduced surfaces being used for mixed cereals and pop corn. The varieties belonging to this convarietiy 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 of the cultivated biotypes and on the sowing technology in Romanian are only few, the demands for this convarietiy 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 +P60.

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

<table>
<thead>
<tr>
<th>A Factor Averages</th>
<th>Yield kg/ha</th>
<th>%</th>
<th>Difference kg/ha</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turda</td>
<td>5320</td>
<td>54%</td>
<td>3705</td>
<td>DL5% = 278 kg/ha</td>
</tr>
<tr>
<td>Jebel</td>
<td>4380</td>
<td>47%</td>
<td>3420</td>
<td>DL1% = 390 kg/ha</td>
</tr>
<tr>
<td>Bărăgan</td>
<td>4558</td>
<td>49%</td>
<td>3854</td>
<td>DL0.1% = 551 kg/ha</td>
</tr>
<tr>
<td>Kesckemeti</td>
<td>3905</td>
<td>42%</td>
<td>3854</td>
<td></td>
</tr>
<tr>
<td>Little jewels</td>
<td>3705</td>
<td>40%</td>
<td>3854</td>
<td></td>
</tr>
</tbody>
</table>

B factor averages

<table>
<thead>
<tr>
<th>Specification</th>
<th>Yield kg/ha</th>
<th>Difference kg/ha</th>
<th>Signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turda</td>
<td>4960</td>
<td>-897</td>
<td>000</td>
</tr>
<tr>
<td>Jebel</td>
<td>4063</td>
<td>-579</td>
<td>000</td>
</tr>
<tr>
<td>Bărăgan</td>
<td>4381</td>
<td>-1487</td>
<td>000</td>
</tr>
<tr>
<td>Kesckemeti</td>
<td>3854</td>
<td>-246</td>
<td>000</td>
</tr>
<tr>
<td>Little jewels</td>
<td>3562</td>
<td>-71</td>
<td>000</td>
</tr>
</tbody>
</table>

DL5% = 124 kg/ha  DL1% = 174 kg/ha  DL0.1% = 246 kg/ha

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

<table>
<thead>
<tr>
<th>A Factor</th>
<th>B Factor</th>
<th>A Factor averages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Turda</td>
<td>Jebel</td>
</tr>
<tr>
<td></td>
<td>Yield kg/ha</td>
<td>% Difference kg/ha</td>
</tr>
<tr>
<td>50.000</td>
<td>5180</td>
<td>3668</td>
</tr>
<tr>
<td>60.000</td>
<td>4709</td>
<td>4229</td>
</tr>
<tr>
<td>70.000</td>
<td>4419</td>
<td>4050</td>
</tr>
</tbody>
</table>

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

CONCLUSIONS

The technological species experimented in Timiş 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.

**BIBLIOGRAPHY**