ON THE RESPONSE TO FERTILISATION OF SOME MAIZE HYBRIDS WITH DIFFERENT VEGETATION PERIODS IN THE ALMĂJ DEPRESSION

REACȚIA LA FERTILIZARE A UNOR HIBRIZI DE PORUMB CU PERIOADĂ DIFERITĂ DE VEGETAȚIE ÎN DEPRESIUNEA ALMĂJULUI

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Abstract. Research was carried out in the hill area of the Almăj Depression on a typical luvsoil and aimed at studying the behaviour of some new winter rape cultivars in different fertilization conditions. The highest yields of over 6700 kg/ha were in the Daniella, Lipesa cultivar, followed by the Lipesa cultivar with over NSSK 420 6500 kg/ha. Protein content varied between 10.95% and 12.73% depending on the hybrid and on fertilization level

Rezumat. Cercetările s-au efectuat în zona colinară a Banatului (teritoriul Buziaș) pe un sol de tip preluvosol tipic și au vizat comportarea unor noi soiuri de rapiță de toamnă, în condiții de fertilizare diferențiată. Cele mai mari recolte de peste 3300 kg/ha s-au obținut la soiul Triangle, urmat de soiul Alaska cu peste 3000 kg/ha și Triumf peste 3000 kg/ha, în condiții de fertilizare cu N150P80K80. Conținutul de ulei a variat între 37% și 47%, în funcție de soi și nivelul de fertilizare.

Key words: maize hybrids and fertilisation

Cuvinte cheie: hibrizi de porumb, fertilizare

INTRODUCTION

Research was carried out on a luvosoil type of soil during the experimental cycle 2004-2006, in the Almăj depression (Caraș County), located in southwestern Romania.

Grain yield was favourably influenced by nitrogen fertilisation. Thus, compared to the agri-fund fertilised with N100, on the average for the eight hybrids, doubling the nitrogen rate increased the yield with 12.00%, and tripling the nitrogen rate increased the yield with 24.00%. Protein content was favourably influenced by nitrogen fertilisers: thus, the protein yield increased from 11.23% for a nitrogen rate of N100 to 11.94% for a nitrogen rate of N200, and to 12.74% for a nitrogen rate of N300.

MATERIAL AND METHOD

Research was carried out on eight maize hybrids with different vegetation periods of the FAO 300-500 group, as follows: LIPESA, CLARICA, ANDREEA, DANIELA, EVELINA, VASILICA, DACIC, and NSSK 420.

The hybrids under study having a strong intensive character, we experimented three rates of nitrogen fertilisation, as follows: N100, N200, and N300 on a constant agri-fund of P80K80.

Sowing densities were of 65,000 plants/ha for the hybrids of the FAO 300 group, of 60,000 plants/ha for the hybrids of the FAO 400 group, and of 50,000 plants/ha for the hybrids of the FAO 500 group.
RESULTS AND DISCUSSION

The synthesis of results obtained during the experimental cycle point out that, though the research area is a hill area with potentially low fertility soils, yields in the research domain were between 5,700 and 7,500 kg/ha.

Nitrogen fertilisers (Table 1) applied at rates higher than N_{100} increased the average yield in the eight hybrids with very significant differences of 719 kg/ha for a nitrogen rate of N_{200} and of 1,209 kg/ha for a nitrogen rate of N_{300}. The Hybrid ANDREEA is a hybrid adapted to the area and, subsequently, covers the largest crop cultivated areas.

In this hybrid, we obtained on the average for the experimental cycle a yield of over 6,400 kg/ha, being overrun with differences lacking significance by the DANIELLA, LIPESA, and NSSK 420 hybrids.

Protein content presented in Figure 1 points out amplitude at the level of the studied factors between 10.10 in the VASILICA hybrid fertilised with a nitrogen rate of N_{100} and 13.40 in the hybrid EVELINA fertilised with a nitrogen rate of N_{300}. Protein yield presented in Table 2 point out an increase of 19.00% for a nitrogen rate of N_{200} and of 41.00% for a nitrogen rate of N_{300} compared to the control nitrogen rate of N_{100}.

CONCLUSIONS

1. Optimising hybrid structures and proper fertilisation in the research area can result in economically efficient crops.
2. Early hybrid crop was at the same level as that of semi-late hybrids, which is important for the area in which spring comes late and the first white frosts occur early in the autumn.
3. Protein content was favourably influenced by nitrogen fertilisers in all experimented hybrids.
4. Protein yield was of over 800 kg/ha in the LIPESA and EVELINE hybrids, and of over 700 kg/ha in all the other hybrids, except for the VASILICA hybrid.

LITERATURE

# Table 1

Grain yield (U = 15.5%) depending on agri-fund and on the cultivated hybrid

<table>
<thead>
<tr>
<th>Factor A Agri-fund</th>
<th>Factor B – Cultivated hybrid</th>
<th>Averages of Factor A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Andreea</td>
<td>Lipesa</td>
<td>Clarica</td>
</tr>
<tr>
<td>N&lt;sub&gt;100&lt;/sub&gt;P&lt;sub&gt;80&lt;/sub&gt;K&lt;sub&gt;80&lt;/sub&gt;</td>
<td>5760</td>
<td>6031</td>
<td>5573</td>
</tr>
<tr>
<td>N&lt;sub&gt;200&lt;/sub&gt;P&lt;sub&gt;80&lt;/sub&gt;K&lt;sub&gt;80&lt;/sub&gt;</td>
<td>6432</td>
<td>6735</td>
<td>6280</td>
</tr>
<tr>
<td>N&lt;sub&gt;300&lt;/sub&gt;P&lt;sub&gt;80&lt;/sub&gt;K&lt;sub&gt;80&lt;/sub&gt;</td>
<td>7129</td>
<td>7422</td>
<td>6902</td>
</tr>
</tbody>
</table>

\[ \text{DL 5\% = 249 kg/ha} \quad \text{DL 1\% = 347 kg/ha} \quad \text{DL 0.5\% = 582 kg/ha} \]

**Averages of Factor B**

<table>
<thead>
<tr>
<th>Hybrid</th>
<th>Andreea</th>
<th>Lipesa</th>
<th>Clarica</th>
<th>Daniella</th>
<th>Evelina</th>
<th>Vasilica</th>
<th>NSSK 420</th>
<th>Dacic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield kg/ha</td>
<td>6440</td>
<td>6729</td>
<td>6252</td>
<td>6790</td>
<td>6484</td>
<td>6180</td>
<td>6571</td>
<td>6381</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>104</td>
<td>97</td>
<td>105</td>
<td>101</td>
<td>96</td>
<td>102</td>
<td>99</td>
</tr>
<tr>
<td>Difference kg/ha</td>
<td>289</td>
<td>-188</td>
<td>350</td>
<td>44</td>
<td>-260</td>
<td>131</td>
<td>-59</td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ \text{DL 5\% = 385 kg/ha} \quad \text{DL 1\% = 694 kg/ha} \quad \text{DL 0.5\% = 933 kg/ha} \]
Figure 1. Evolution of protein content (%) depending on nitrogen rate

Table 2

<table>
<thead>
<tr>
<th>Factor B – Cultivated hybrid</th>
<th>Andreea</th>
<th>Lipesa</th>
<th>Clarica</th>
<th>Daniella</th>
<th>Evelina</th>
<th>Vasilica</th>
<th>NSSK 420</th>
<th>Dacic</th>
</tr>
</thead>
<tbody>
<tr>
<td>N100P80K80</td>
<td>651</td>
<td>726</td>
<td>660</td>
<td>654</td>
<td>685</td>
<td>554</td>
<td>635</td>
<td>620</td>
</tr>
<tr>
<td>N200P80K80</td>
<td>788</td>
<td>863</td>
<td>750</td>
<td>797</td>
<td>811</td>
<td>676</td>
<td>755</td>
<td>763</td>
</tr>
<tr>
<td>N300P80K80</td>
<td>937</td>
<td>989</td>
<td>855</td>
<td>920</td>
<td>966</td>
<td>818</td>
<td>906</td>
<td>895</td>
</tr>
</tbody>
</table>

Hybrid Andreea Lipesa Clarica Daniella Evelina Vasilica NSSK 420 Dacic

Yield kg/ha 792 859 765 790 821 683 765 759
%

Difference kg/ha 67 -27 -2 29 -109 -27 -33

Significance