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 Buziaş) pe un sol de tip preluvosol tipic şi 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 şi Triumf peste 3000 kg/ha, în condiții de fertilizare cu $N_{150}P_{80}K_{80}$. Conținutul de ulei a variat între 37% şi 47%, în funcție de soi şi 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 (Caraş County), located in southwestern Romania.

Grain yield was favourably influenced by nitrogen fertilisation. Thus, compared to the agri-fund fertilised with N_{100}, 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 N_{100} to 11.94% for a nitrogen rate of N_{200}, and to 12.74% for a nitrogen rate of N_{300}.

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: N_{100}, N_{200}, and N_{300} on a constant agri-fund of $P_{80}K_{80}$.

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 N300 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.

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Table 1

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

Factor A Agri-fund	Factor B – Cultivated hybrid								Averages of Factor A			
	Andreea	Lipesa	Clarica	Daniella	Evelina	Vasilica	NSSK 420	Dacic	Yield kg/ha	%	Difference kg/ha	Significance
$N_{100}P_{80}K_{80}$	5760	6031	5573	6060	5741	5483	5839	5667	5769	100		
$N_{200}P_{80}K_{80}$	6432	6735	6280	6795	6501	6123	6594	6442	6488	112	719	XXX
$N_{300}P_{80}K_{80}$	7129	7422	6902	7515	7210	6933	7281	7034	7178	124	1409	XXX

Dl 5% = 249 kg/ha Dl 1% = 347 kg/ha Dl 0.5% = 582 kg/ha

Averages of Factor B

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

Dl 5% = 385 kg/ha Dl 1% = 694 kg/ha Dl 0,5% = 933 kg/ha

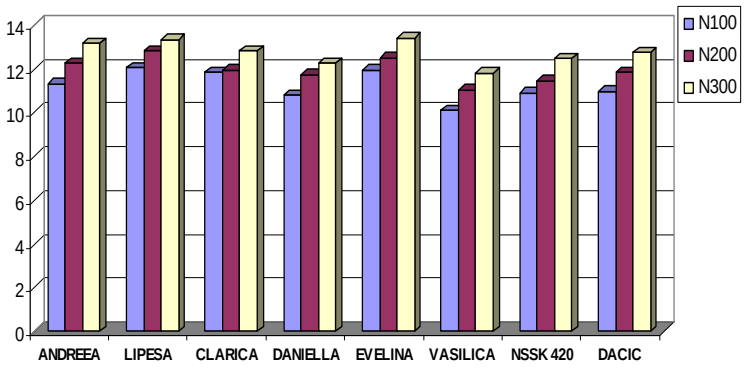

Figure 1. Evolution of protein content (%) depending on nitrogen rate

Table 2

Protein yield depending on agri-fund and on the cultivated hybrids

Factor A Agri-fund	Factor B – Cultivated hybrid								Averages of Factor A		
	Andreea	Lipesa	Clarica	Daniella	Evelina	Vasilica	NSSK 420	Dacic	Yield kg/ha	%	Difference kg/ha
$N_{100}P_{80}K_{80}$	651	726	660	654	685	554	635	620	648	100	
$N_{200}P_{80}K_{80}$	788	863	750	797	811	676	755	763	775	119	127
$N_{300}P_{80}K_{80}$	937	989	885	920	966	818	906	895	914	141	266

Hybrid	Andreea	Lipesa	Clarica	Daniella	Evelina	Vasilica	NSSK 420	Dacic
Yield kg/ha	792	859	765	790	821	683	765	759
%	100	108	96	100	104	86	96	96
Difference kg/ha		67	-27	-2	29	-109	-27	-33
Significance								