REACTION OF SWEET CORN HYBRIDS IN TERMS OF LOWER PLAINS OF TIMIS

Gheorghe DAVID, Paul PÎRŞAN, Adrian BORCEAN, Georgeta POP, Simona NIŢĂ

Banat's University of Agricultural Sciences and Veterinary Medicine, Faculty of Agricultural Sciences, Timişoara, Aradului Street, no 119, Timiş 300645, Romania
gheorghedavid@yahoo.com

Abstract: *Sweet corn is a crop plant at which in the last two decades cultivated areas increased significantly, due to the growing interest of being consumed by people both fresh and canned form. The main objective of this research was to determine the behavior of sweet corn hybrids in different climatic years, the soil type molic brown eutricambosoil. Also we aim to optimize fertilization and plant density.*

Key words: *sweet corn, hybrids, fertilizers*.

INTRODUCTION

In the period 2011 - 2013 were tested three corn hybrids (extra early hybrids Deliciul Verii and Estival and the early hybrid Prima) in terms of production capacity, sowing density and fertilization.

To characterize climate we use multi-reference period from Timisoara meteorological station. During the vegetation period we monitored the major pathogens and performed observations on the milky stage of corn cobs maturation for red mold of corn cobs and stalks(*Gibberella zeae),* white flowering of cobs(Gibberella fujikuroi) and also we monitored the common smut of maize(*Ustilago zeae).*

Harvesting was performed at milk maturity stage of cobs.

MATERIAL AND METHOD

The material used in the experimental field research included three sweet corn hybrids, developed at Agricultural Research Station Turda (Deliciul verii, Estival şi Prima), all hybrids belonging to *Zea mays* var. *saccharata*.

Figure 1 present the main physical features of the soil while in figure 2 are presented the main chemical properties of brown eutricambosoil type, moderately gleyed from the experimental field. This soil present a slightly acid reaction, with an average supply of phosphorus and potassium and a good to average supplyof humus content.

Research conducted in experimental cycle 2011 - 2013, were organized as a trifactorial experience, with the field plots placed after the subdivided parcels method with the following graduations of factors:

-factor A - agro with graduations - a1 - $N_0P_{100}K_{100}$; a2 - N_{100} $P_{100}K_{100}$; a3 - N_{150} $P_{100}K_{100}$;

-factor B - hybrids - b1 - Prima; b2 - Deliciul verii; b3 - Estival;

-factor C - plant density - c1 - 45000 plants / ha; c2 - 65,000 plants / ha.

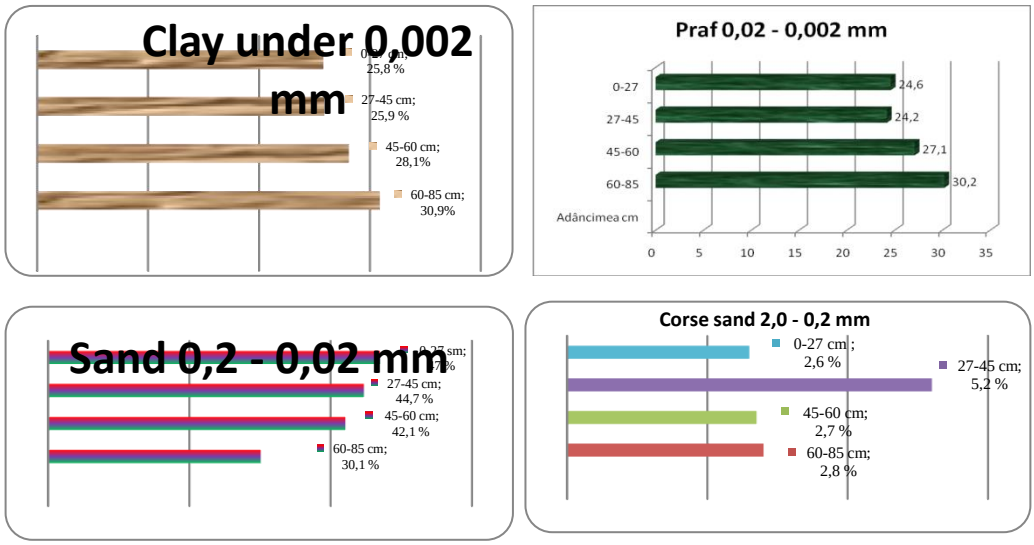

Figure 1. Main physical characteristics of the soil of the experimental field

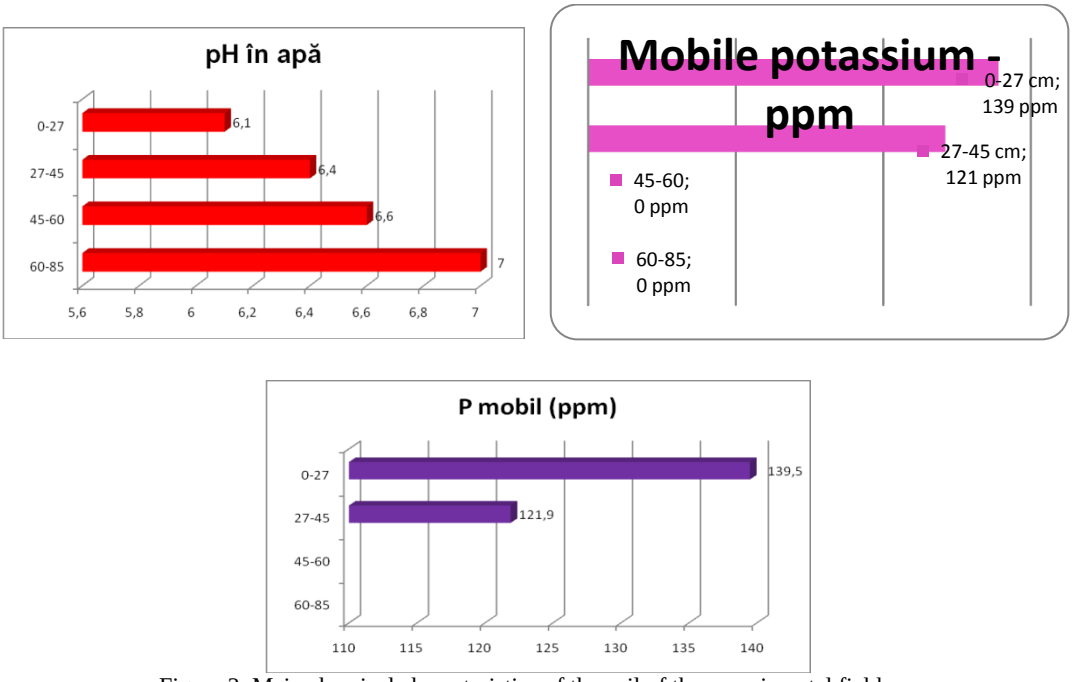

Figure 2. Main chemical characteristics of the soil of the experimental field

RESULTS AND DISCUSSIONS

Synthesis of experimental field results obtained between years 2011 - 2013 are shown in table 1.

Tabelul 1.

Synthesis of crops results obtained in Timiş Lower Field area on the experimental cycle 2011 – 2013.

Factor A Fertilizers amounts	Factor B Hybrid	Factor C Plants Density (plants/ha)		Average factor A			
		45.000	65.000	Cropp (Kg/ha)	%	Diference (kg/ha)	Significance
$N_0P_{100}K_{100}$	Prima	10075	11343	10121	100	-	-
	Deliciul verii	9175	10731				
	Estival	9036	10363				
$N_{100}P_{100}K_{100}$	Prima	12234	14138	12479	123	2358	xxx
	Deliciul verii	11348	13177				
	Estival	11103	12878				
N_{150} $P_{100}K_{100}$	Prima	14936	16232	14439	143	4318	xxx
	Deliciul verii	13142	14989				
	Estival	12978	14358				

DL 5% = 521 kg/ha; DL 1% =1079 kg/ha; DL 0,1% =1967 kg/ha

Averages of factor C

Specification	45000	65000
Crop (kg/ha)	11559	13134
%	100	114
Diference (kg/ha)	-	1575
Significance	-	-

DL 5% = 319 kg/ha; DL 1% =479 kg/ha; DL 0,1% =721 kg/ha

Averages of factor B

Specification	Prima	Deliciul verii	Estival
Crop (kg/ha)	13159	12094	11786
%	100	92	99
Diference (kg/ha)		-1065	-1372
Significance	-	00	000

DL 5% = 521 kg/ha;DL 1% =1079 kg/ha; DL 0,1% =1967 kg/ha

Analyzing these synthesis data, it appears that the climatic conditions of the experimental cycle 2011 - 2013, nitrogen fertilizers applied on a ground of $P_{100}K_{100}$ had a favorable effect on the crop. Production results show an increase of yield results with 23 % at a nitrogen amont of 100 kg / ha active substance comparing with witness. This means a production increase of 2358 kg / ha comparing with witness statisticaly ensured as a very significant difference.

Increasing the nitrogen to 150 kg of nitrogen / ha, the yeald growth rate show an increase of 45% comparing with witness which means a phisical increase of yield with 4318 kg / ha providing a very significant statistical difference.

Refering to the corn plants density, we find an yield increase of 14% in by increasing plants density form 45,000 plants / ha to 65,000 plants / ha, which means an physical difference of the yield of 1575 kg / ha, statisticaly ensured as very significant to witness.

Among the studied hybrids, witness Prima production hybrid superior to the other two hybrids (Deliciul verii and Estival). The hybrid Deliciul verii register an yield difference of 1065 kg/ha lower to witness Prime which means an yield decrese of 8 %. Also at hybrid Estival the yield was lower with 1372 kg/ha which means a decrease of 10 %.

CONCLUSIONS

1. The three experimental years were different in terms of climate. Thus, between 2011 and 2013 were met best conditions for sweet corn plants development. In 2012, the high temperatures during May-July time period has as result lower yields compared to the years 2011 and 2013.

2. Nitrogen fertilizers applied to a constant background of 100 kg/ha phosphorus and potassium has as result an yield increase of 23% at 100 kg /ha nitrogen and a 43% increase at 150 kg/ha nitrogen.

3. At a density of 65 000 plants /ha there was an yield increase of 14% from the yield obtained at a density of 45000 plants/ha.

4. Among the three studied hybrids, the best adapted hybrid to the soil and wheather conditions from the research area was Prima, followed by the Deliciul verii.

5. The cultivation under stress conditions, it is recommended apply crop irrigation in order to obtain high and quality yields.

6. During the reporting period there were found higher disease sensitivities of plants against major diseases, specialy at higher nitrogen amounts.

BIBLIOGRAFIE

1. DAVID GH., BORCEAN I., 1993, Porumbul zaharat prezent şi perspective în vestul ţării, Lucrări ştiinţifice, partea I, seria Agronomie, vol. XXVI, Timişoara
2. DAVID GH., 1997, Contribuţii la stabilirea tehnologiei de cultivare a porumbului zaharat în partea de vest a României, Teză de doctorat, USAMVB Timişoara.
3. DAVID GH., BORCEAN A., 2001, Contribuţii la tehnologia de cultivare şi protecţia porumbului zaharat în Câmpia Timişului, Lucrări ştiinţifice, partea I, seria Agronomie, vol. XXXIII, Timişoara
4. DAVID GH., IMBREA FL., GĂVRUŢĂ A. –2005, Contributions to the establishment of hybrid structure and development of cultivation technology of sweet maize in the banat area, Lucrări ştiinţifice, seria Agronomie, vol. XXVI, Timişoara