RESEARCH REGARDING THE BEHAVIOUR OF A MAIZE HYBRID VARIETY UNDER PEDOCLIMATIC CONDITIONS IN THE MUREȘULUI MEADOW

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Abstract: *Due to the very high productivity and multiple uses of its products in human food, in animal husbandry an industry, corn is one of the most important crops on our planet (IMBREA, ET AL., 2011). Due to the large surfaces it covers, and especially due to its high productions, mankind depends on corn for food (DAVID, ET AL., 2003). In this context, even though it is one of the oldest plants cultivated, corn still remains one of the most studied plants. The large number of hybrids homologated for cultivation in Romania hinder farmers in selecting the right hybrid variety which should insure, in the current context of climatic changes, constancy in production and, implicitly, superior performance (GROS, ET AL., 2010). The current research answers this challenge in an area where maize, next to wheat, covers the largest cultivated surfaces. The bilogic matrial used in this research is represented by Dekalb maize hybrids, the research highlighting the special value of the biologic amterial and the favourable response to the applied technology.*

Key words*: maize, technology, pedoclimatic conditions ,*

INTRODUCTION

Coming from Central America, maize is cultivate in many worldwide regions nowadays, as an important food plant and a very important raw material resource in industry and in animal husbandry. Alongside wheat, maize represents 80% of the global cereal production.

MATERIALS AND METHODS

The research was carried out on a gley cambic chernozem soil (figure 1 and 2) within the territory of the Satu Mare locality, Arad County. From the result analysis, we can infer that the soil displays an alkali reaction on the entire profile, with a medium humus content up to 51 cm, and a normal total nitrogen content. The soil is rich in mobile phosphorus up to 51 cm and lower under 51 cm, and the and high assimilable potassium content up to 51 cm and moderate under 51 cm. There is fine texture within the entire profile. Experiments were organised according to the slip method with three repeats. We experimented with three hybrids (two early varieties: DKC 3939, DKC 4590 and a semi-late one DKC 5222) belonging to the Monsanto Company. The previous plant in all fields was autumn wheat.

The applied technology was the one specific to the wheat-maize crop rotation.

After clearing the field of the straw stubble, we proceeded with furrowing at a 25-27 cm depth. In spring, after the land dried, a work with the disc harrow was carried out, combined with adjustable teeth.

In order for the experimental hybrids to express their production capacity, fertilisation with $N_{200}P_{100}$ was undertaken. The fertilisers were applied upon preparation of the seedbed as complex 20:20:0 fertilisers, 500 kg/ha, respectively half of the nitrogen and the entire phosphorus dose.

The rest of the nitrogen was applied as ammonium nitrogen, during vegetation.

Before seeding, a work with an aerator was carried out, perpendicular with the seeding direction.

Seeding was undertaken when the soil temperature reached 8-10 ^{0}C, during the month of April. Seeding density was established at 65000 b.g/m^2.

Two hoeings were undertaken during the vegetation period, no pest and disease controls were necessary. Harvesting took place when the plant reached maturity (humidity of18-20%).

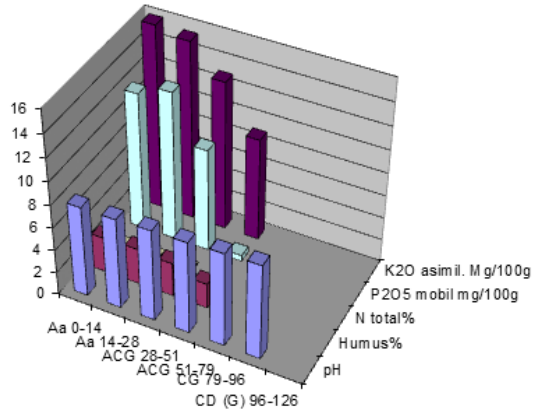

Figure 1. Results of soil chemical analysis in experimental field

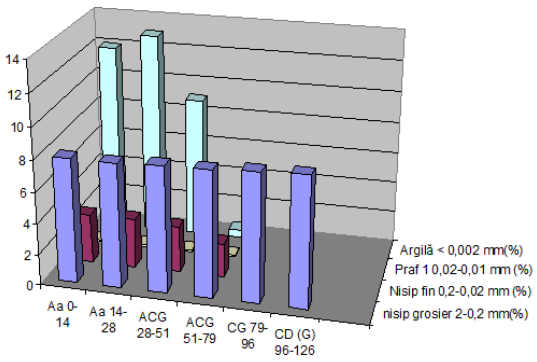

Figure 2. Results of soil physical analysis in experimental field

RESULTS AND DISCUSSIONS

The results obtained during harvest in the comparative crop of three maize hybrids with different vegetation periods from the experimental year 2016 are presented in table 1.

It is remarkable that the field average of the three experimental hybrids exceeded 7000 kg grains standard/ha, as well as the fact that no experimental hybrid registered productions under 7000kg grains/ha. Significant differences in comparison with the field average were registered with the hybrid DKC 5222, amounting to 8269 kg/ha.

Table 1

Crop results obtained in comparative culture, in 2016

Hybrid	Crop Kg/ha	%	Difference Kg/ha	Significance
Field average	7630	100		
DKC 3939	7148	93	482	00
DKC 4590	7474	98	156	-
DKC 5222	8269	108	638	XXX

DL5 % = 342 kg/ha; DL 1% = 459 kg/ha; DL 0,1% = 619 kg/ha.

The crop harvest was carried out during the current year, on the 29th of October. At the date of harvest, the grains' humidity content ranged between 16.9% and 23% (figure 3).

The grains' humidity content ranged between 16% and 18% (16.1% DKC 3939, followed by DKC 4590 - 16,6% and DKC 5222 - 17,8%) .

The rapid water loss of the grain reaching maturity represents a characteristic extremely useful for cultivators, which needs to be taken into account for the correct selection of hybrids to be cultivated in each area.

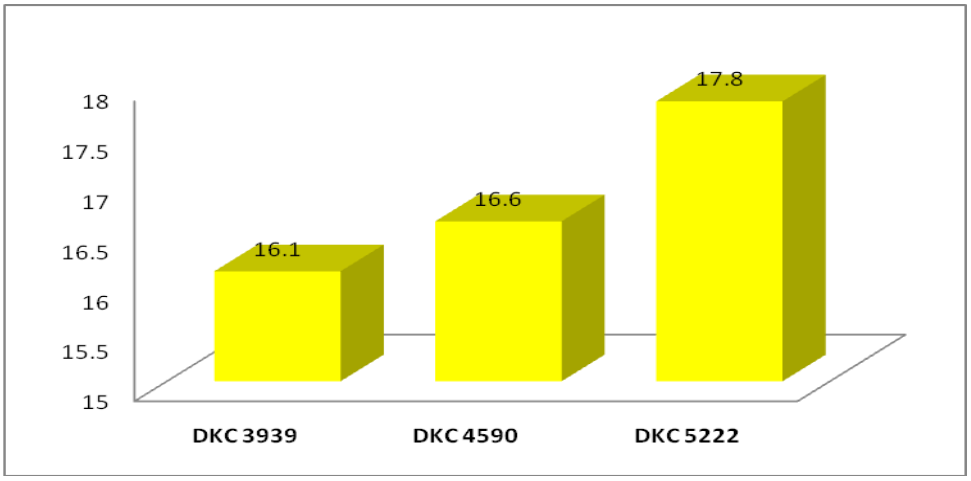

Figure 3.Humidity registered in the experimental field, in 2016

CONCLUSIONS

The experimental hybrids are characterised by a high production capacity, a plant architecture which allows for their cultivation with high density, they have an elastic stem, resilient to breaking and dropping and they are also resilient to pests and diseases.

The present research comes to answer such a challenge in ana area where maize, alongside wheat, covers the largest cultivated surfaces. The research has also outlined the special value of the biologic material and the favourable response to the applied technology, which, under normal cultivation conditions and through the correct choice of hybrid variety can determine economically efficient productions.

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