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ANALYSIS ON THE PRODUCTIVITY OF MAIZE HYBRIDS IN 2016

DUMITRU EDUARD ALEXANDRU¹, MICU ANA-RUXANDRA², REBEGA DANA³

Summary: *The yield per hectare in agricultural products is influenced by many factors, from the type of soil, plants seed, the precipitates level, climate, culture technologies, and hybrid genetic potential of it is cultivated. So in the case of maize, these criteria can influence yields per hectare, which can cause reduction of farmer profitability. Currently on the market in Romania, farmers can choose from a wide range of hybrids, depending on the factors affecting the productivity of the farm.*

Keywords: *hybrid, maize hybrids performance*

INTRODUCTION

The importance of global corn is undeniable, being in the top three of the most cultivated plants in the world, this being determined by a number of characteristics which confer preferential status among those who cultivate it. One of these features would be great manufacturing capacity by about 50% higher than other cereals, given that the world population is continuously growing.

Also of great ecological plasticity corn, realizing high yields and constant caused by lower deviations influence climate, and a payment being good run for a broad spectrum of cultures. Farmers in Romania prefer this culture because it can be grown in monoculture, but also by the fact that it allows seeding later in the spring, which enables better scheduling of agricultural operations.

Mechanized harvesting can be done without danger of shaking and capitalize well organic and mineral fertilizers, providing higher yields when irrigated.

In enforcing production uses are multiple and essential, so that the corn used in human food, by grinding the beans, which are intended various products valued by consumers as: corn flour, corn flakes, milk artificially and syrups rich, mainly consumed by people with diabetes, beer, lozenges, etc.

Of particular importance it has in animal nutrition, with a rich nutritional value. From the resulting cobs after removing grain can be used to feed ruminants. All of this product can be obtained furfural (oily substance, colorless or pale yellow, with different uses, helping to refine oils, insecticides and fungicides to obtain), or vitamins are used as fuels. Strains of maize (cobs) are used in animal feed after a preliminary chopping and preparation (by pickling, mixed with molasses, etc.)

Regarding technologists corn itself, it can be grown on different soils, but its cultivation soils should be avoided extremes. Among plants a good seed, may include perennial legumes, cereal grains, flax, hemp. Although it can be cultivated in monoculture, should not follow the same field more than 2-3 years.

To obtain a high production is necessary to apply large amounts of nutrients, capitalizing well both organic fertilizers and chemical ones. Plowing occurs immediately after releasing land to a depth of 25-30 cm. Seedbed preparation consists in leveling the land and produce a layer of loose soil and ground the depth at which incorporates seed.

The seeding is achieved when the depth of 10 cm there is a temperature of 8-10 degrees C. The maintenance of the plant is to achieve 3-4 mechanical hoeing between the rows, so that the working depth varies depending on the state of vegetation and development of the root system.

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In Romania, the best known is harmful maize leaf weevil (*Tanumescus dillaticolis*) that occurs especially where it is grown in monoculture, crop rotation therefore has an important role in combating this pest.

Mechanical harvesting corn is done when grain moisture is below 25% and observe black layer which separates the grain cobs.

MATERIALS AND METHODS

The research is based on information taken from the village farm Elsit Orezu city Ciochina, Ialomita county who tested a series of 84 types of hybrids belonging to different companies producing seed, which sells this product in Romania.

The farm has provided two batches for each type of hybrid (lot 1 and lot 2 = 3.281 square meters = 3360 square meters) each benefiting from the same factors of production, the only difference being given by the genetic hybrid.

Also, it has been used the same production technology as follows::

- Previous plant 2015: wheat
- Previous plant 2014: sunflower
- Seeding density: 70000 grains/ha
- Precipitations: 330 L/ms between March and August 2016
- Soil works:
 - Stubble in July – August 2015;
 - Plowing 30 cm in October 2015;
 - discing in October 2015;
 - Fertilize with ammonium nitrate 281.5 kg / ha, on 18/03/2016;
 - Prepare germinative bed using combiner in April 2016;
 - sowing and fertilized simultaneously with application of complex fertilizer 18.46.0 in the amount of 95 kg / ha of commercial product between 03/04/2016 - 04/07/2016;
 - herbicide Adengo 0.35 l / ha preemergence 10/04/2016;
 - Universal Buctril herbicide 0,7 l / ha 4-6 leaf stage of corn on 05/12/2016;
 - herbicide EQUIP 2 l / ha during 8-10 leaf stage of corn and 10-15 cm height costreului on 05/31/2016;
 - No mechanical weeding;
 - No insecticide treatments;
 - No treatments with fungicides.

RESULTS AND DISCUSSION

Taking into consideration the yields obtained in the two sole reference in the same conditions of growth factors, it was able to express productivity cultivate hybrids, resulting in their genetic performance.

Table no. 1.**The yields of maize hybrids on the part of the field no. 1.**

Clasament	Producer	Hybrids	70000 (plants / ha) Quantity harvested 1 (kg / 3281 sqm)	70000 (plants / ha) Humidity (%) lot 1 at harvest time
1	Monsanto	DKC 5141	3274	15.5
2	Pionner	P 9903	3080	14.4
3	Pionner	P 0023	3078	14.4
4	Pionner	P 9241	3068	14.3
5	Monsanto	DKC 3969	3056	13.8
6	Pionner	P 9537	3026	14.6
7	Monsanto	DKC 4541	3010	13.7
8	Euralis	ES LAGOON	2986	14.3
9	Pionner	P 9911	2962	15.8
10	Limagrain	LG 30389	2918	15.0
11	Pionner	P 0216	2916	15.6
12	IF Porumbeni	PORUMBENI 458 MRF	2882	14.1
13	Monsanto	DKC 5068	2874	14.5
14	Euralis	ES CORTES	2870	13.3
15	Limagrain	LG 3350	2866	13.9

Source: Farm Elsit, village Orezu, Ciocina commune, Ialomita County;

Portion of land no. 1, he returned each type of hybrid (a total of 84 hybrids), 3281 square meters of land which was cultivated, which has higher production was recorded by hybrid DKC 5141 (Monsanto) with a production of 3274 kg / 3281 sqm to 15.5% grain moisture at harvest time. Second place in terms of production was located P9903 hybrid (Pioneer) with 3,080 kg / 3,281 sq m and a moisture content of grain 14.4% (*Table no. 1.*).

Table no. 2.**The yields of maize hybrids on the part of the field no. 2.**

Clasament	Producer	Hybrids	70000 (plants / ha) Quantity harvested 1 (kg / 3281 sqm)	70000 (plants / ha) Humidity (%) lot 1 at harvest time
1	Monsanto	DKC 5141	3244	12.8
2	Monsanto	DKC 3969	3168	12.4
3	Pionner	P 9537	3164	12.6
4	Euralis	ES LAGOON	3162	12.9
5	Caussade	LOUBAZI	3154	12.6
6	IF Porumbeni	PORUMBENI 458 MRF	3118	13.2
7	Pionner	P 0216	3106	13.3
8	Syngenta	IRRIDIUM	3100	13.0
9	Monsanto	DKC 4717	3090	12.9
10	Pionner	P 0023	3088	12.9
11	Pionner	P 9911	3086	13.4
12	Monsanto	DKC 4541	3084	12.8
13	Syngenta	COBALT	3080	12.6
14	Pionner	P 9903	3062	12.9
15	Euralis	ES CORTES	3062	12.5

Source: Farm Elsit, village Orezu, Ciocina commune, Ialomita County;

Portion of land number 2, with an area of 3,360 square meters which returned each hybrid, the first place was occupied by the same hybrid DKC 5141 (Monsanto) with a production of 3244 kg / 3360 sqm, but with a moisture content lower and namely 12.8%, while the second was another hybrid from Monsanto DKC 3969, which received a production of 3168 kg / 3360 sqm humidity of 12.4% (*Table no. 2.*).

Table no. 3.**Achieved total production of hybrids (filed no. 1 + filed no. 2)**

Clasament	Producer	Hybrids	70000 (plants / ha) Production (kg / ha) - Average lot 1 and lot 2	70000 (plants / ha) 14% humidity amount (kg / ha)
1	Monsanto	DKC 5141	9814.79	9800.06
2	Monsanto	DKC 3969	9372.08	9456.43
3	Pionner	P 9537	9320.89	9358.17
4	Pionner	P 0023	9284.75	9317.24
5	Euralis	ES LAGOON	9257.64	9294.67
6	Pionner	P 9903	9248.61	9280.98
7	Pionner	P 9241	9206.44	9261.68
8	Monsanto	DKC 4541	9176.33	9245.15
9	IF Porumbeni	PORUMBENI 458 MRF	9034.78	9066.41
10	Pionner	P 9911	9107.06	9052.42
11	Caussade	LOUBAZI	8962.51	9047.65
12	Euralis	ES CORTES	8932.39	9030.65
13	Pionner	P 0216	9067.91	9027.11
14	Monsanto	DKC 4717	8929.38	8987.42
15	Syngenta	COBALT	8863.12	8965.05

Source: Farm Elsit, village Orezu, Ciocina commune, Ialomita County;

Regarding the yields obtained by the best hybrids made available by the participating companies, taking into account the humidity Stas productions, we can say that the product DKC 5141 won the best production of 9.8 t per hectare, product followed by DKC 3969 with a production of about 9.4 t per hectare both Monsanto, a production by almost 4% lower than the product DKC 5141 (*Table no. 3*).

Table no. 4.**Total production obtained from the group of maturity (filed no. 1 + filed no. 2)**

Producer	Hybrids	70000 (plants/ha) 14% humidity amount (kg/ha)
Grupa FAO 200		
Donau Saat	DANUBIO	8171.06
As Hibridi	AS 201	7697.03
Grupa FAO 300		
Pionner	P 9537	9358.17
Pionner	P 9903	9280.98
Pionner	P 9241	9261.68
Monsanto	DKC 4541	9245.15
Caussade	LOUBAZI	9047.65
Grupa FAO 400		
Monsanto	DKC 5141	9800.06
Pionner	P 0023	9317.24
Euralis	ES LAGOON	9294.67
IF Porumbeni	PORUMBENI 458 MRF	9066.41
Pionner	P 9911	9052.42
Grupa FAO 500		
Donau Saat	CORASANO	8014.79
As Hibridi	AS 507	7118.89
Grupa FAO 600		
Maisadour	MAS 70 F	4912.37

Source: Farm Elsit, village Orezu, Ciocina commune, Ialomita County;

Analyzing the 84 hybrids by group of maturity where the Group FAO 200 (whose SUTU must be 1300 degrees C and a maximum of growing season of 143 days), the best result obtained hybrid Danubio 8.1 t / ha. Also FAO 300 Group category (whose SUTU must be 1340 degrees C and a maximum 144-day growing season), the most productive hybrid was 9.3 t / ha, and in terms hybrids from FAO group 400, the highest production was obtained by DKC 5141 with a production of 9.8 t / ha (SUTU 1365 degrees Celsius and a maximum of 145 days vegetation) (*Table no. 4*).

CONCLUSIONS AND RECOMMENDATIONS

In terms of factors like production and application technologies same culture, different productions of the hybrid is the result of genetic dowry use. Also hybrids differ depending on the Group and FAO, depending on the requirements of farmers choosing a hybrid as they take into account the climatic conditions they encountered on the farm.

The product with the highest yield, DKC 5141, who managed a productivity of 9.8 t/ha is found at a US company Monsanto, is a hybrid semi-tardy, part of the FAO 460 group with high production potential and a tolerance to stressors water and temperature and is recommended for areas south, west and southeast.

So in addition to a number of factors that influence the productivity of maize crop as soil type, amount of rainfall in the areas culture technology applied which differ from one farmer to another specific temperature zone, a decisive factor is the quality hybrid, representing, among others, the criterion for distinguishing between seed companies on the domestic market and the Romanian farmers can compete on equal footing with yields obtained in other European countries.

Hybrids of experience, differentiation yields obtained inter area was determined by maturity group to which it belongs, and the manufacturer has chosen, covering as many possible customers requirements, depending on their requirements. Also be taken into account by the regime of culture, if land area is irrigated or not, sensitivity to herbicides hormonal growth rate in the first vegetation, thus indicating its ability to fight weeds mode harvest, and the destination of the crop (if used in animal feed or human food).

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