

RESEARCH ON THE INFLUENCE OF CLIMATE CONDITION ON HYBRIDS MAIZE IN THE BIG ISLAND OF BRAILA

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Abstract

The stage of climatic factors in accordance with the stage of growth and development of maize plants allow a proper assessment of the production.

The experiment was placed in the Big Island of Braila ecosystem, on an alluvial gleize soil type, in the crop year 2008.

For a better of track the influence of climatic factors, the experiment was placed in three randomized block sequence and three variants.

The maize hybrid which was taken as the only control that benefitt from irrigation.

Due to low rainfalls and high temperatures, the yield values recorded between 4,326 kg/ha and 5,572 kg/ha; the control recorded a yield of 6,930 kg/ha.

INTRODUCTION

The Big Island of Braila represents an area favourable to maize growth.

Considering that maize is a valuable plant both biologically and economically, the cultivated area has considerable increased over the last years.

For a successful harvest, the choice of hybrids has a great importance considering the fact that the Big Island of Braila is situated in an area which has high thermal potential and irregular precipitation during the maize vegetation period. Thus, the elimination of these variations in point of precipitation can be done by applying irrigation, a measure which contributes to the improvement of the quality and quantity of maize production.

During the research undergone in the Big Island of Braila, when two maize hybrids were experimented under irrigation and non-irrigation conditions, it has been demonstrated that under natural conditions of the ecosystem, the quality and quantity of the resulting production is closely related to the maintenance of a good water supply throughout the entire vegetation period. This is because the water from rainfalls is not enough for obtaining a high rate of production.

It was noticed that the highest level of water consumption was recorded from the beginning of earring until the first stage of in-wax ripening. After this stage, the

maize needs for humidity were significantly reduced, and temperature became the main factor for its full maturation.

MATERIAL AND METHODS

Research was developed in a station for two years, 2007 and 2008 within the Pescarus Farm from the Big Island of Braila, having in view the development of the PR36R10 and Florencia hybrids under irrigation and non-irrigation conditions.

The soil type on which the experiment was located was gley typically immersed. On the ploughed stratum, the soil was mainly alkaline, with 8.15 pH value, the humus content was good (3.49%), very well supplied with nitrogen (0.37%), potassium (130 ppm) and phosphorus (31.2 ppm).

The experiment was located bifactorially, the shape of the lots was rectangular with two factors, each factor having two degrees, as follows:

- factor A – the hybrid: a_1 = Florencia; a_2 = PR36R10;
- factor B – water conditions: b_1 = non-irrigated; b_2 = irrigated.

The experiment consisted of three replications ($n = 3$) and there were 12 plots.

The sowing density for both hybrids was 70,000 germinated seeds/ha.

Within the experiment, there was observed the influence of several factors on the maize production. In this hereby research paper, some of the results are presented regarding the influence of the irrigation system on the harvest obtained from the two hybrids as well as the density of maize crop.

RESULTS AND DISCUSSION

The annual average temperature recorded in 2007 had values almost equal to the reference year, the only difference being in September, when a negative deviation of -4.5°C was recorded (Figure 1).

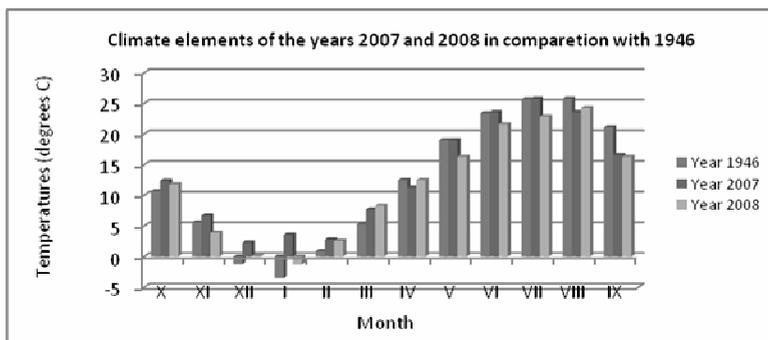


Fig. 1. Climate elements - temperatures

The average rainfall in 2007 was 194 mm during the maize vegetation period while 2008 recorded an average rainfall of 327 mm.

A very important role in maize growth and development is played by temperature which was closely related to precipitations.

Throughout the two experimental years, by analyzing the water factors recorded within the Lunca Station from the Big Island of Braila, we can notice that 2008 recorded values of rainfall higher than in 1946 and in the first year of the experiment (Figure 2).

The temperatures of the farming year 2008 had positive deviations in September, the rest of the values being inferior to the temperatures in the reference year.

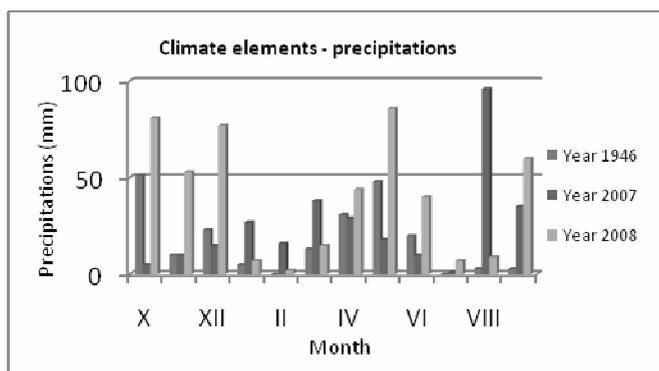


Fig. 2. Climate elements - precipitations

For the analyzed hybrids, observations were performed concerning uniformity and density when maize springs, the maize obtained and humidity at harvest time. Both hybrids were harvested on the 5th of October (2007 and 2008) for the option of the irrigated soil and on the 11th for the hybrids cultivated on non-irrigated soil. The harvest of the hybrids at the same date in both years was possible owing to the favourable weather conditions for the crop. According to the data in table no1, the percentage of the sprung plants varied between 89% and 97.5%, which demonstrates that during the period between seeding and springing, maize had optimum conditions. If we correlate rainfall during the two years and density at the moment of springing and also the average harvest obtained, we can notice that hybrid Florencia recorded the highest crop in 2008, that is 8,530 kg/ha.

Humidity at harvest time recorded for both hybrids was of 17%. The harvest obtained from a non-irrigation soil with both hybrids had values around 7,050 kg/ha, recording higher values in 2008 compared to 2007.

Table 1**Harvests obtained from hybrids on a non-irrigated soil**

Year	Hybrids	Density at sprung (plants)	Percent of the sprung plants (%)	Average harvest (kg/ha)
2007	Florencia	63,200	90.28	8,154
	PR36R10	61,210	87.44	6,310
2008	Florencia	63,200	90.28	7,631
	PR36R10	64,730	92.47	7,210

Analyzing the data in Table 2, we can notice that the percentage of sprung plants was between 87.44% and 92.47%. Thus, the percentage was clearly lower, compared to the hybrids cultivated on an irrigated soil.

Table 2**Harvests obtained from hybrids on a irrigated soil**

Year	Hybrids	Density at sprung (plants)	Percent of the sprung plants (%)	Average harvest (kg/ha)
2007	Florencia	66,000	94.28	8,300
	PR36R10	64,850	92.64	7,235
2008	Florencia	68,300	97.57	8,530
	PR36R10	62,530	89.32	7,100

The average crops were between 6,300-8,154 kg/ha, lower than the crops cultivated on an irrigated soil. Therefore, the only hybrid that recorded a larger harvest on non-irrigated soil was PR36R10, which had a production growth of 110 kg/ha.

CONCLUSIONS

1. The type of soil on which the two harvests were sown had a major role in obtaining the crops, because it was noticed that the harvest of the two hybrids were far lower as compared to other areas from the Big Island of Braila.
2. The difference of harvests considering, the harvest from an irrigated soil and the one on a non-irrigated soil for the two hybrids, varied between 100 and 900 kg.

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