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RESEARCH ON THE PRODUCTIVITY OF SORGHUM HYBRIDS, IN INAND, BIHOR COUNTY

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Abstract

Climate change has become a reality. Modern agriculture will have to look for solutions to these climate changes. Sorghum is one of the cereals of the future, a plant that easily adapts to water stress conditions, less fertile, eroded soils, a plant that better withstands high temperatures, drought, heat due to the viability of pollen that withstands over 40^0C and not least sorghum is an ecological plant that absorbs in one year per 1 hectare cultivated over 50 tons of CO_2 from the atmosphere.
In this paper we studied 3 sorghum hybrids in climatic conditions in Inand, Bihor County an area affected by climate change.

Key words: sorghum, hybrid, temperature, rainfall.

INTRODUCTION

Grain sorghum is a crop of the future, an alternative to corn cultivation in global warming conditions. Harvested in the form of grains, sorghum has the most diverse uses, from animal or human food to energy biomass.

Agronomical, sorghum benefits from innovations brought by genetics by creating new hybrids with different characteristics such as: high productivity, resistance to various diseases or pests, adaptation to water stress conditions.

Weed control is progressing through the marketing of herbicides, especially against grasses.

The introduction of sorghum into the crop leads to a decrease in pests, it is known for its effects against nematodes.

The use of sorghum is also very effective as an alternative to corn on land heavily affected by Diabrotica.

The ability of sorghum to efficiently extract much of the available mineral nitrogen from the soil makes it a plant with moderate requirements for nitrogen fertilizers, leaving very little mineral nitrogen in the soil, which helps reduce water nitrite pollution. (Prosorgho 2016).

MATERIAL AND METHOD

In this paper we set out to study the productivity of some hybrids at Inand in the conditions of 2018.

We started to grow 3 sorghum hybrids for grain Es Foehn, Arabesk, Es Shamal which we grew on a plot of 420 m^2.

When preparing the land we plowed at 22-25 cm, in the spring we carried out a work with the disc harrow in the aggregate with the harrow with adjustable fangs at 8-10 cm depth. Before sowing, we carried out a work with the combine for a better crushing, leveling and laying the soil (Domuta C 2006).

Sowing was carried out with the SPC-6 seed drill at a density of 300,000 germinating grains per hectare and at the same time fertilization with 250 kg of complex fertilizers 16.16.16. per hectare.

After sowing we performed pre-emergent herbicide dispersion with Dual Gold EC 1.2 liters per hectare.

To maintain the sorghum crop when the plant was in the three-leaf stage, a mechanical weeding and fertilization with 100 kg of nitrogen per hectare were carried out.

To control weeds in vegetation we carried out an herbicide dispersion with Amino 600 SL 1 liter / ha.

The climatic conditions in Inand for 2018 referred to temperature and precipitation.

The temperatures for the agricultural year 2018 were noted every day at 7^{00}, 13^{00} and 17^{00} hours were averaged per day and then per decade and then per month.

Precipitation was noted in mm per day then the amount per decade was made and then the amount per month.

Physical analyzes, humidity, hectoliter mass were performed with the Perten 5200 A analyzer.

The mass of 1000 grains (MMB) is determined after harvest for each hybrid. It is expressed in grams.

The seeds are counted randomly and grouped by 10, then grouped by100 and then grouped by 500. The two samples of 500 are weighed separately and the results are collected. The mass of 1000 grains is thus obtained.

(State Institute for Variety Testing and Registration 2008)

RESULTS AND DISCUSSION

In table 1 we have noted the average temperatures per decade then the monthly average starting with September 2017 with the beginning of the production cycle and until August 2018.

Also in table 1 we have the precipitations per decades, then the total per month.

On the last column of the table we have noted the rainy days on the production cycle these totaling 66 days.

Table 1

Temperatures and precipitation recorded in Inand in the agricultural year 2018

MONTH	Temperature ˚C				Precipitation mm				
	Decade I	Decade II	Decade III	Monthly average	Decade I	Decade II	Decade III	Whole month	Rainy days
September 2017	19.3	20.9	11.4	17.2	23.1	-	28.2	51.3	4
October 2017	12.2	14.8	8.4	11.8	-	-	37.9	-	4
November 2017	6.1	6.4	2.5	5	5.8	8.9	39	53.7	5
December 2017	2.1	3.6	3.2	2.9	28.2	42.5	-	70.7	7
January 2018	4.9	1	1.1	2.3	8.6	14.3	3.8	26.7	4
February 2018	2.9	1.3	-2.9	0.4	41.8	12.2	8.8	62.8	9
March 2018	1.4	4.1	3	2.8	28.8	25.1	22.4	76.3	11
April 2018	14	18.2	20.7	17.6	27.3	-	9.8	37.1	4
May 2018	22	17.8	22.1	20.6	-	33	-	33	5
June 2018	23.2	23.2	22.2	22.9	13.2	25.9	10.1	49.2	4
July 2018	21	22.6	23.3	22.3	34.5	22.9	22.3	79.7	9
August 2018	25.9	26.6	23.7	25.4	-	-	-	-	0

In figure 1 we have the graph of the average monthly temperatures, where we can observe the coldest month as February with an average of

0.4^0C and the warmest month as August with an average temperature of 25.4^0C.

The average temperature per production cycle is 12.6^0C, the average temperature higher than those of 1995,1996,1997 when the average annual temperature was 10.7^0, 10.4^0 and 10.9^0C

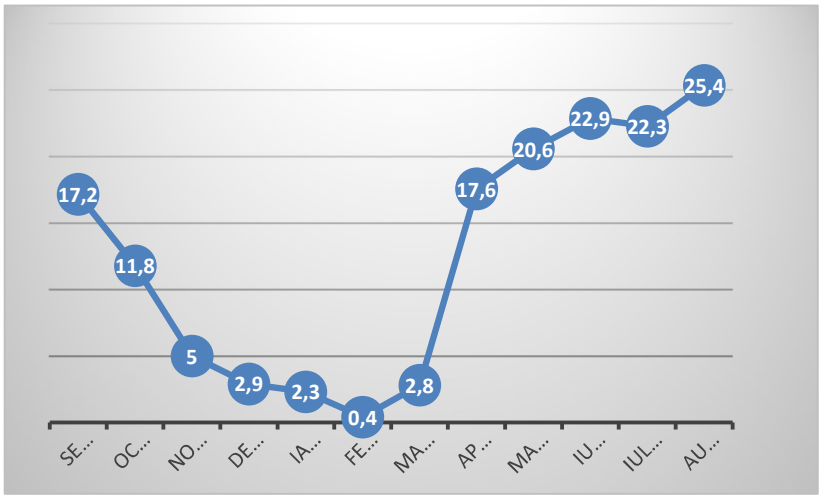

Fig 1 Graph of monthly average temperatures on the production cycle.

In figure 2 we have the precipitation graph on the production cycle where we can see that in October 2017 and August 2018 we did not have precipitation, and the total amount of precipitation on the production cycle is 540.5 mm.

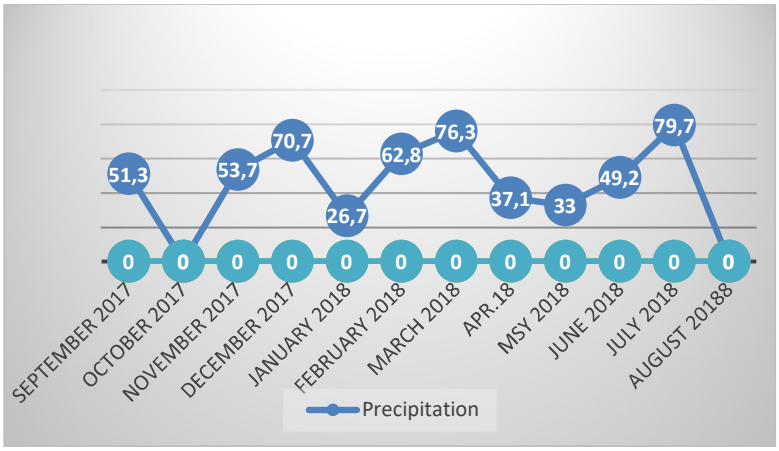

Fig. 2 Graph of monthly precipitation in mm

Table 2 presents the yield of sorghum hybrids on the plot of 420 m^2 and the productions in kg.

Table 2

Productions for sorghum hybrids on the plot

CRT NO	VARIANT	PLOT SURFACE IN m^2	PRODUCTION/ PLOT IN kg
1	FOEHN	420	290
2	ARABESK	420	284
3	ES SHAMAL	420	297

Table 3 presents the results of the physical analyzes, respectively the humidity, the mass of 1000 grains (MMB), the hectoliter mass (MHL) and the productions of the hybrids related to the hectare.

Table 3

Hybrid yields per hectare and physical analyzes

CRT NO	VARIANT	HUMIDITY %	MMB(g)	MHL (Kg)	PRODUCTION / HECTARE IN kg
1	FOEHN	13.1	26	81	6905
2	ARABESK	13.0	24	79	6762
3	ES SHAMAL	12.8	27	81	7071

CONCLUSIONS

The average temperature of the production cycle 2018 from Inand, Bihor county was 12.6^0C and the precipitations were 540.5 mm in 66 days.

In these climatic conditions, the best production was obtained for the ES Shamal sorghum hybrid of 7071kg / ha at a humidity of 12.8%, the STAS production at a humidity of 14% is 7169 kg / ha.

The Foehn sorghum hybrid obtained a production of 6905 kg / ha at a humidity of 13.1% and the STAS production is 6977kg / ha.

For the Arabesk sorghum hybrid, the production obtained was 6762kg / ha at a humidity of 13%, the STAS production being 6840 kg / ha.

The Es Shamal hybrid has the largest MMB of 27g and Foehn and Arabesk have 26g and 24g grams respectively.

The hectoliter mass is equal for the Shamal and Foehn hybrids and it is 81 kg and for the Arabesk hybrid it is 79 kg.

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