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COMPARATIVE STUDY OF THE AGRONOMIC CHARACTERISTICS OF SIX MAIZE HYBRIDS IN THE ARAD PLAIN, WITH A VIEW TO THEIR INTRODUCTION IN TO CULTURE.

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Abstract:

Maize is one of the most important crops due to its multiple uses. Maize, an annual plant, is a remarkable cereal, thanks to its high production capacity, about 50% higher than other cereals, short life cycle, resistance to diseases and pests, drought resistance, monoculture support, great possibility of capitalizing production, can be grown in various ecological conditions. The paper presents the synthesis of the results from the 2021-2022 experimental cycle. The general objective of the research concerns the behavior of an assortment of corn hybrids created by the companies DEKALB, KWS, RAGT and LIMAGRAIN, in terms of the level of required harvests and quality. The area under study is part of the Arad Plain and is characterized by very good vegetation conditions for corn cultivation, being included in the very favorable area for cultivation in our country.

• Introduction

The main objective of the study is to contribute to the elaboration of an intensive technology for this plant, in conditions of good favorability. The research carried out on the topic "Comparative study of agronomic characteristics of six corn hybrids in the Arad Plain, in order to introduce them into the crop" carried out during 2021-2022 led to important results both theoretically and practically regarding this crop.

• Material and method

The general objective of the research concerns the behavior of an assortment of corn hybrids created by the companies DEKALB, KWS, RAGT and LIMAGRAIN, in terms of the level of harvests obtained and its quality.

The area under study is part of the Timiș Plain and is characterized by very good vegetation conditions for corn cultivation, being included in the very favorable area for cultivation in our country. The research was carried out during 2021-2022.

In order to highlight the behavior of the corn hybrids studied, determinations were made regarding:
- grain production, depending on the hybrid (kg/ha);
- mass of 1000 grains (g);
- hectoliter weight (kg/ha);
- calculation of economic efficiency.

The studied agricultural experience is monofactorial

• Results and discussions

RESULTS ON THE MASS OF 1000 GRAINS

Table 1
Synthesis of harvest results obtained in the experimental cycle 2021-2022

Variant	Harvest kg/ha	Relative production n %	Production difference kg/ha	Semification
DKC 4943	3950	104	165	XX
LIGETIX	3400	90	-385	000
LG 1415	3515	93	-270	000
X Media câmpului	3785	100	MT.	
DKC 5830	4600	121	815	XXX
HI CORN 450	3750	98	-55	
KAŠMIR	3515	93	-270	000

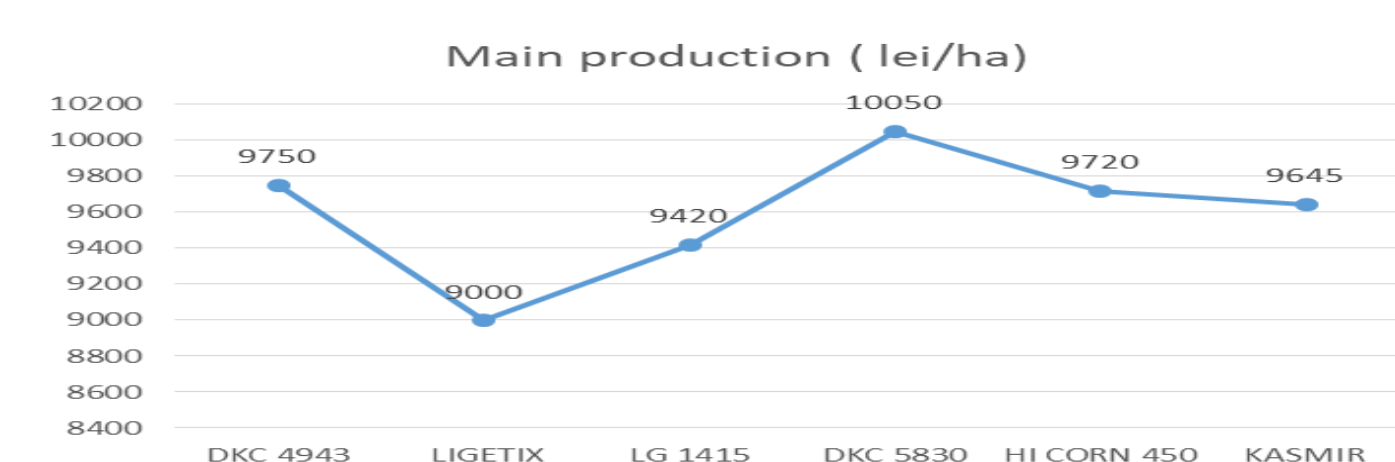


Fig. 1. MMB values over the two experimental years.

RESULTS CONCERNING THE STANDARD MASS PER STORAGE VOLUME

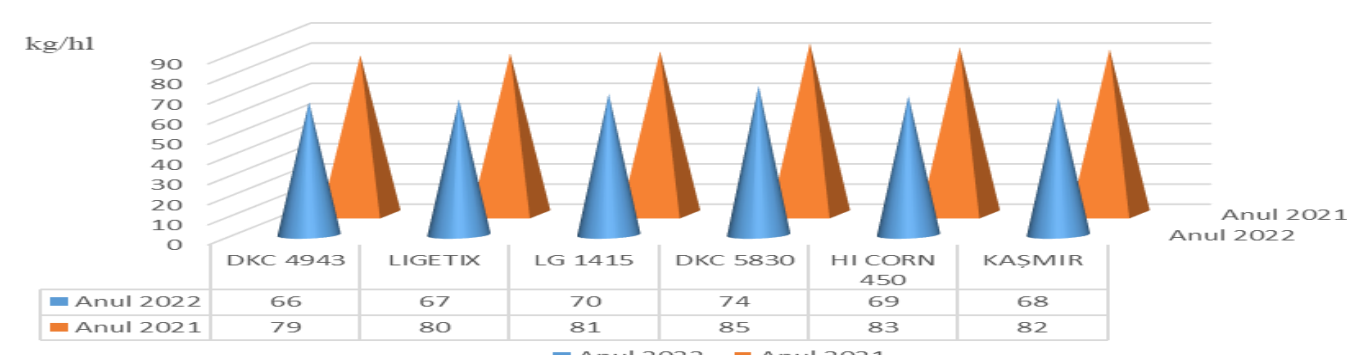


Fig. 2. Results on standard mass per storage volume (kg/hl) in experimental cycle 2021 to 2022.

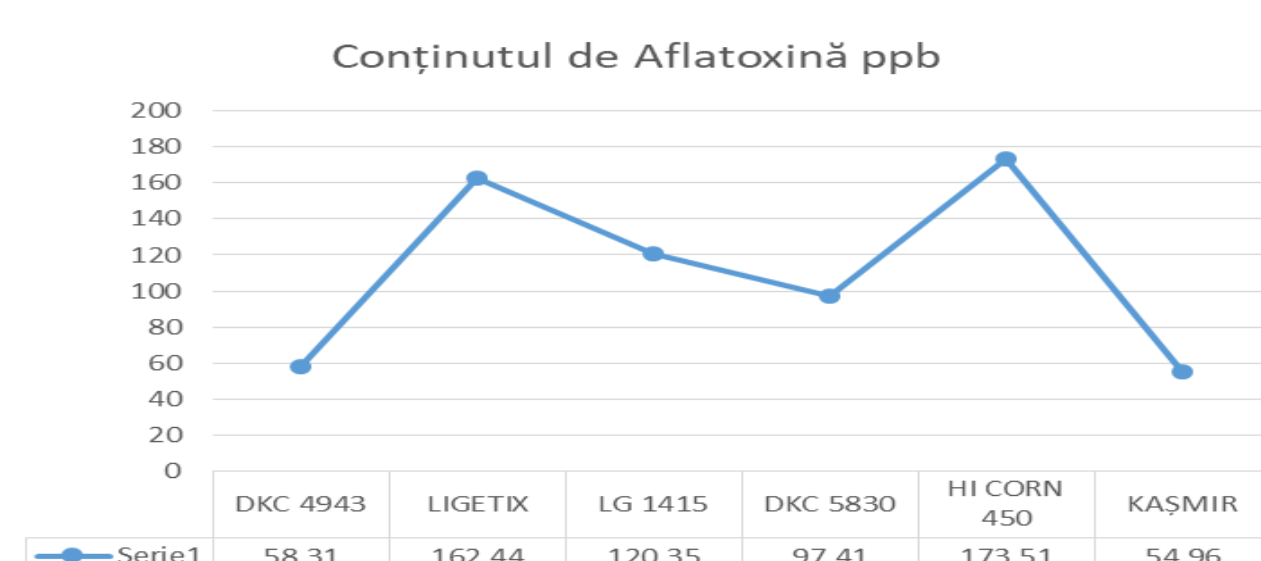


Fig. 3. Aflatoxin content (ppb) in 2022 corn samples

Principal Calculation of Indicators to Economic Efficiency 2021

- In order to highlight the profitability of the corn crop for grains, we considered it necessary to calculate the main indicators of economic efficiency. The analyzed indicators are as follows:
 - main production (kg/ha); – value of main production (lei/ha); – production expenses (lei/ha); – production cost (lei/kg);
 - total profit (lei/ha); – profit rate (%).

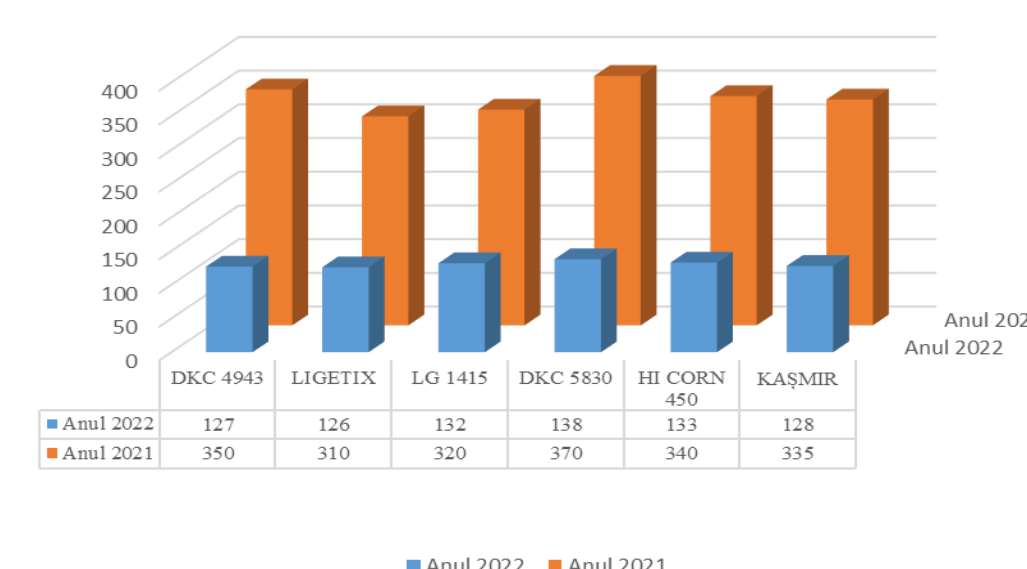


Fig. 4. Main production value

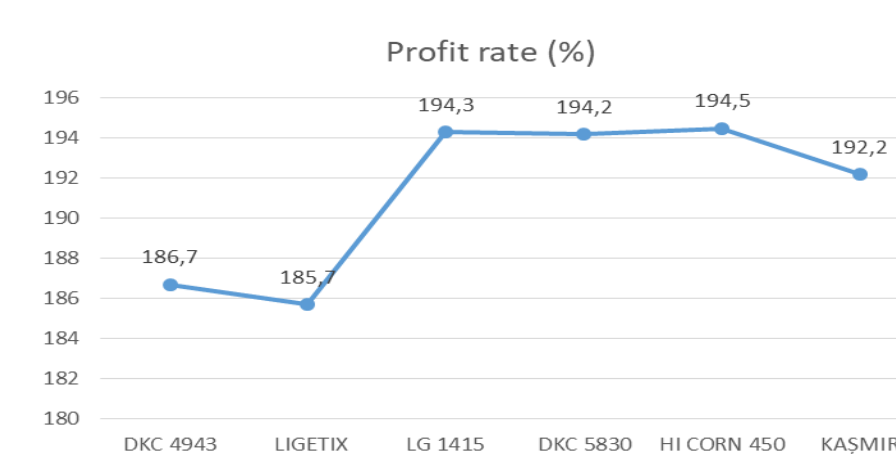


Fig. 6. Profit rate (%)

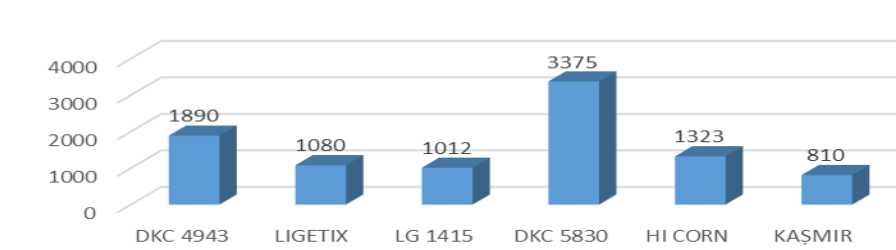


Fig. 8. Main production value

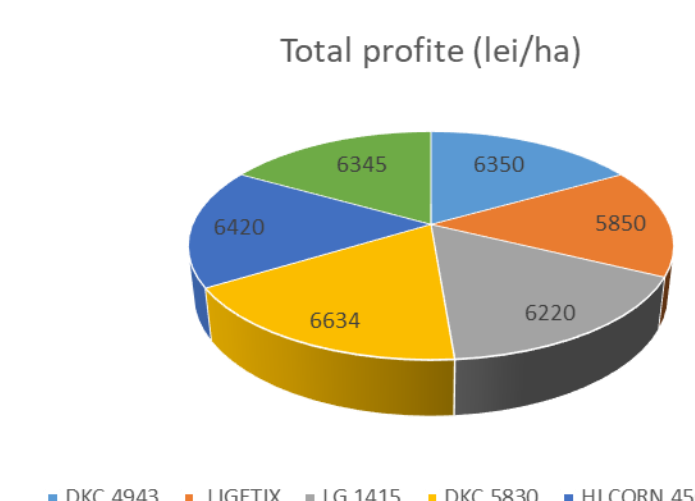


Fig. 5. Total profit (lei/ha);

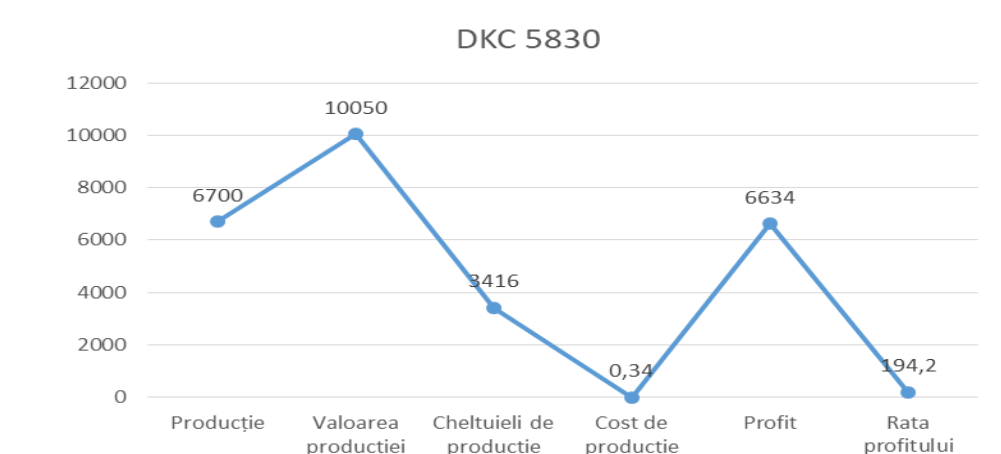


Fig. 7. The economic efficiency of the DKC 5830 hybrid

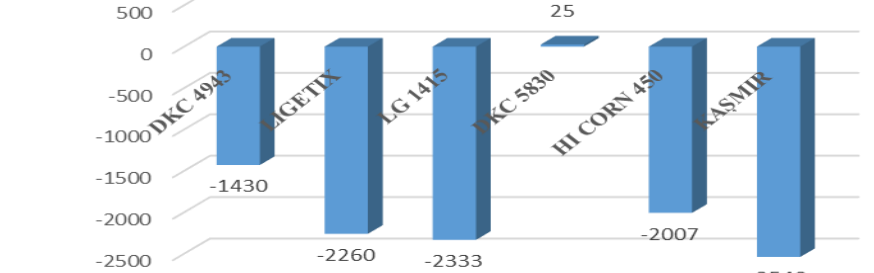


Fig. 9. Total profit (lei/ha);

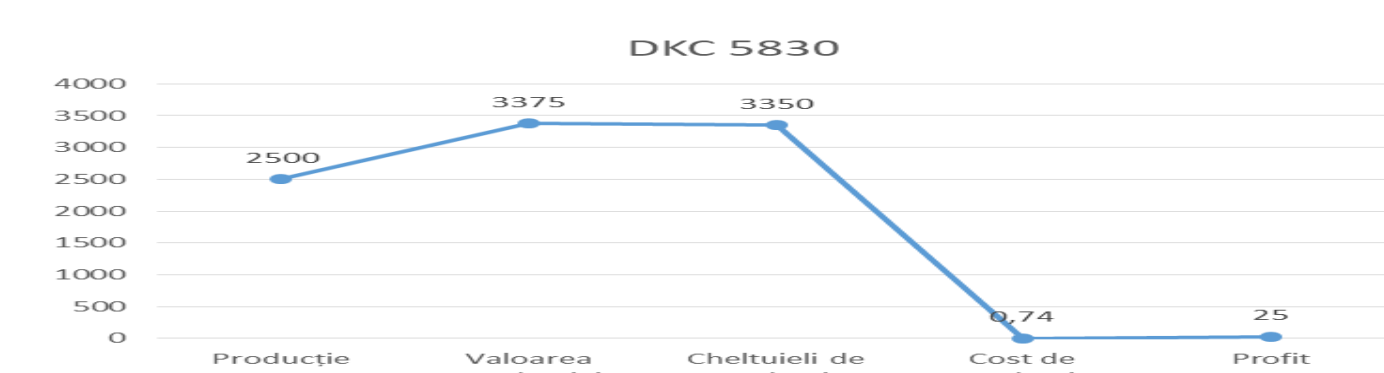


Fig. 10 The economic efficiency of the DKC 5830 hybrid

• Conclusions

- As a result of the research carried out during the two experimental years (2021 – 2022), the following conclusions were drawn.
- The different climatic conditions during the two experimental years, particularly in terms of precipitation, strongly influenced the production obtained.
- Production is determined genetically, but is largely influenced by climatic conditions during the growing season and the technology applied.
- In most cases, climatic conditions influence crop yields positively or negatively.
- Each cultivated genotype reacts differently to climatic conditions.
- Regarding the interaction of year and hybrid on thousand grain mass, from the presented data we can conclude that the DKC 5830 hybrid performed better in both experimental years, with the highest thousand-grain mass values.
- As with thousand grain mass, the value of standard mass per liter can be influenced by different environmental conditions for each hybrid grown. The data presented confirms that in 2021, the highest values of mass in hectoliters were recorded in all hybrids studied. The highest values were achieved in the hybrid DKC 5830 of 85 kg/hl during the two experimental years.
- According to the data in Figure 3.5, we observe that in 2022 the values of the mass in hectoliters are much lower, ranging from 66 kg/hl (DKC 4943) to 74 kg/hl (DKC 5830), the reason being the unfavorable climatic conditions for the harvest of but this year.
- Following laboratory analysis, corn samples ranged from 54.96 ppb (Kashmir) to 173.51 ppb (HI CORN 450) (Figure 3.6.), above the maximum allowable limit of 10 ppb, for total aflatoxins, in accordance with Commission Regulation (EC) No. 1881/2006 of 19.12.2022 setting maximum levels for certain contaminants in foodstuffs.
- Following the analysis of the 6 hybrids during the two experimental years, it was concluded that the best results in terms of economic efficiency were obtained by the DKC 5863 hybrid.
- For corn cultivation, fertilization plays a vital role in achieving higher yields in terms of quantity and quality.
- As a result of this study, we can say that the application of appropriate technology for corn cultivation must combine: balanced fertilization, depending on the expected result (quantity, quality, resistance to diseases and pests) and a valuable genotype, these in the context of constantly changing climatic conditions.