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PRODUCTIVITY AND ECONOMIC EFFICIENCY OF CULTIVATION CORN FOR GRAIN UNDER THE CONDITIONS OF A GROUP OF COMPANIES «LNZ GROUP»

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Abstract. *The article analyzes the productivity and economic efficiency of the cultivation of intensive type corn hybrids. It was found that the average yield is 9.6t/ha, and the level of profitability is more than 65% (for 2019-2021). It was established that the primary role in the formation of high productivity is played by the hybrid and favorable growing conditions.*

Key words: *corn, hybrid, yield, profitability.*

Introduction

The problem of providing humanity with the main high-quality products is increasingly becoming one of the most important challenges of modern times and requires careful state regulation and attention. The solution to the issue of food supply requires the solution of all modern problems of the agro-industrial complex and its basis – agriculture. To ensure food security, modern innovative technologies are used more and more, they are undoubtedly a modulator of innovative development, growth of productive forces. It depends on many factors: the level of development of the agricultural sector, including private farms; development of the food industry; the level of export-import operations; the level of purchasing power and culture of the population; possibilities of using innovative technologies; financial capabilities of enterprises; material and technical support and investment attractiveness of agribusiness enterprises; state support, benefits granted to agro-industrial complex enterprises, effective fiscal policy [1,2,4,6,10,11].

Obtaining high-tech and high-quality food and fodder corn solves important

economic and social problems. Corn grain contains up to 87% dry matter, 70% of which is starch, 9-12% protein, 4-7% fat, suitable for the production of high-quality flour, groats, oil, corn flakes, starch, glucose, alcohol, molasses, etc. It is worth noting that the soil and climatic conditions of the Forest Steppe of Ukraine satisfy the bioecological requirements of corn [2, 9].

Modern crop production in the region is focused on the cultivation of corn for grain, the area of which is constantly expanding. It is interesting to note that over the past 10-15 years, cultivation technology has significantly intensified, the average yield has increased from 4 t/ha to 7 t/ha. At the same time, world practice shows the significant potential of culture. The world recorded record in Britain was 28t/ha, in the USA it was even 36t/ha on fields that were irrigated [5, 11].

A significant part of the income from the sale of corn grain is due primarily to the high efficiency of the crop, the sown area of which has increased by more than 20-25% over the past five years, and the gross harvest in recent years has reached 35 million tons, which has had a positive effect on the economic efficiency and competitiveness of products on domestic and foreign markets. The expansion of the sown areas of corn for grain and the increase of its productivity are due to the active use of modern hybrids of the intensive type, which have high viability and adaptability to growing conditions. There are many hybrids of domestic and foreign selection on the market [3, 8, 9].

It is known that in certain soil and climatic conditions it is possible to obtain a high yield of corn when using hybrids of different maturity groups to create a harvesting conveyor for the purpose of efficient harvesting and the formation of homogeneous batches of high-quality grain.

The selection of an assortment of hybrids capable of providing high grain productivity of corn to increase the volume of cereal production is of primary importance in the efficiency of the functioning of agricultural enterprises. When choosing hybrids for growing corn for grain, it is advisable to give preference to those that, during the formation of the crop, make the most full use of the soil and climatic conditions of the growing season. The key indicators are the ripeness group, resistance to lodging and major pests and diseases, the ability to form a stable grain yield despite extreme factors [3,5].

Important aspects of innovative methods of managing the production of corn grain are the strengthening of concentration and intensification of production, which is a good basis for the introduction of the latest resource-saving technologies for the production of grain and other products, such as the development of precision agriculture; satellite monitoring of crops; field and yield mapping; management of equipment, etc. [4, 7, 13].

The purpose of the research was to conduct a comparative assessment of the grain productivity of corn hybrids to substantiate the choice of the most efficient ones grown in the conditions of the Cherkasy region and to determine the factors that affect the economic indicators of the farm.

Research materials and methods.

LNZ Group is a Ukrainian vertically-integrated agro-industrial holding specializing in the trade of seed material and plant protection products, the cultivation of grain and industrial crops, animal husbandry and grain trading activities. Created

on the basis of the plant for the production of sowing seeds in the village of Lebedyn. The most valuable hybrids were selected for research. The work uses general economic indicators of the enterprise. Statistical data processing was carried out according to generally accepted methods [12].

Results and their discussion.

Cultivated hybrids are medium-ripened (table). Comparing biological features, we can say that these are hybrids of the intensive type and they have minor differences. The average yield of the studied hybrids over the past 3 years is more than 9.6 t/ha, which is a good result. In favorable years, a result of 15 t/ha was achieved in the hybrid DKS 3441 Max Yield. Noted. That the coefficient of variation in more productive hybrids is greater, which indicates a rather volatile indicator and lower stability.

Table - Production and economic indicators of growing hybrids

Indicator / Hybrid	DKC 3441 Max Yield	DK 315 Brilliant	EXPM 014
FAO	220	310	330
Grain type	tooth-shaped	tooth-shaped	tooth-shaped
Cold resistance	8	7,5	8
Stability and plasticity	9	9	8
Drought resistance	8	7,5	8
Initial growth energy	8	8	9
Resistance to Fusarium stem/cob	8	8	9
Moisture release	9	9	9
Arid conditions	-	55-60	50-60
Unstable hydration	65-70	65-70	60-70
Sufficient hydration	75-80	70-75	70-75
Growing areas	unstable and sufficient hydration	all zones	all zones
Yield, average, tons/ha	100,7	87	101,1
Maximum yield, t/ha	150,1	122,2	145,2
Minimum yield, t/ha	81,2	83,9	75,9
Cv.	35,3	24,5	34,7
Profitability,%			
2019	86,5	81,4	88,3
2020	52,4	55,2	58,1
2021	64,4	60,3	67,6
Average	67,8	65,6	71,3
Cv.	25,5	21,2	21,6

The analysis of the level of profitability showed that, on average, for the studied years, this indicator was not lower than 65%, and in a favorable year, the average for varieties exceeded 88%. The coefficient of variation of this indicator is 22.8% and differed slightly between hybrids.

Having conducted a dispersion analysis of the influence of weather conditions and biological characteristics of the hybrid on the formation of productivity, it was found that the prevailing factor contributing to the formation of high productivity is the characteristics of the hybrid (more than 40%). Growing weather conditions exert an influence on 29%, and the interaction of the above factors - 27% under the conditions of the forest-steppe zone and for the studied hybrids.

Conclusions and suggestions.

Thus, it can be concluded that the productivity of intensive-type corn hybrids in the forest-steppe zone of Ukraine has a significant share of unrealized genetic potential. All hybrids in some years are able to form a yield of more than 12 tons/ha. In favorable years, an average increase in productivity by 20-25% was noted. The level of profitability of growing on average for the studied hybrids is more than 65%, in favorable years - more than 88%. The coefficient of variation of the productivity indicator indicates average stability. As a result of statistical processing, it was found that the primary role in the formation of high productivity is played by the hybrid and favorable weather conditions of vegetation. The obtained data should be taken into account when selecting hybrids in order to intensify the growing technology and obtain the maximum economic effect.

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