# STUDIES REGARDING THE HARVESTING OF GRAIN CORN

**Radu ILEA, Sorin BUNGESCU, Daniel POPA, Ioan CABA**

*Agricultural and Veterinary Medicine University of the Banat, Timişoara, Romania*
*Corresponding author: Radu Ilea, e-mail:ileaupc@yahoo.com*

***Abstract:*** *Maize (Zea mays) is one of the most important crop plants, with multiple uses in human nutrition, animal feed and in the industry. High corn yields can be obtained by the use of high yield hybrids by using optimal technologies of cultivation of maize and of modern technology of mechanized works. With minimum losses for the harvesting grains, their main objectives are the use of modern requirements and adjusted on the optimum harvesting. The experience was located on an area of 5 hectares on land of Cărpiniş, jud. Timiş. They are 19 varieties of hybrid corn cultivated. The combine harvester was John Deere W550 with corn header for 6 rows. For the determination of samples harvested corn hybrids, are used performance apparatus for measuring and monitoring. Most major productions were obtained from drought-resistant varieties.Cereal harvesting is the fulfillment and the end of the agricultural production process as it is the meeting point of all man's doings, of all spiritual and material efforts, that the society invested in the agricultural process. This paper presents a comparative study concerning the harvesting of corn hybrids.*

***Key words:*** *hybrid, harvest, combines harvesters, corn header, and yield*

## INTRODUCTION

Global agriculture is confronted today with one of the toughest challenges of the 21st century. In the midst of a changing climate, such activity must ensure that doubling the production of food in order to ensure the requirements of 9 billion people will populate the earth before 2050, while protecting the environment.

In order to meet basic human necessary, agriculture must become more productive and more sustainable. Natural resources (soil, water, energy) are limited. Research on developing innovative technologies that will allow agriculture to made more over, to conserve more and to improve the life. The use of seeds with high biological value and improve agricultural technologies, through efficient use of resources, can help the world's agriculture to answer of these challenges.

Due to the particularities of maize: good resistance to drought and heat, a relatively small number of pests and diseases, adaptability to different climate conditions, the corn is one of the most important crop plants. According to FAO statistics, the distribution of maize consumption is: 21% human nutrition, 72% animal feed, and 7% in the industry. High corn yields can be obtained by the use of high yield hybrids, by using optimal technologies of cultivation of maize and of modern technology of mechanized works.

Data included in this paper are based on the experimental and production fields at the S.C. AGRO-KISS S.R.L. (District of Timiş). The combine harvester was John Deere W550. For the determination of samples harvested corn hybrids, are used performance apparatus for measuring and monitoring.

In the context of an increase in demand for food worldwide, is becoming increasingly important use of technology to ensure that increases production on the same land area, while preserving biodiversity and preserving the environment.

## MATERIAL AND METHODS

Researches were carried in the experimental and production fields at the S.C. AGRO-KISS S.R.L. on the territory of Cărpiniş. The experimental field is located in the north-western part of the Banat, 25 km from Timişoara. The climate is specific to the Banat's Plain, more open to western winds and to the influence of the Mediterranean and Atlantic currents, which makes it moister. Ground water is 0.5-5 m deep in the soil, the highest levels being in April-May and the lowest ones early in winter.

They are 19 varieties of hybrid corn cultivated (figure 1).


Figure 1: The cornfield with corn hybrids

The experimental field was grown according to the classical technology.

The work of plowing was performed in the autumn of 2011 at the depth of 30 cm. The experimental field they were fertilized before planting with 400 kg/ha (27;13,5;0). The sprayer before planting was adengo and after planting was equip+mustang.

Sowing was done in 22 April 2012. Planting density was 68000 grains per hectare.

The seeds used in the study are produced under the brand of Dekalb.

The level of precipitation from sowing to harvesting was 170 l/mp.

The harvesting was carried out on the 2$^{nd}$ of October 2012, when all the varieties of humidity were less than 15%. The combine harvester was John Deere W550 with corn header for 6 rows (figure 2).

For the determination of samples harvested corn hybrids, are used performance apparatus for measuring and monitoring.

Figure 2: The combine harvester John Deere W550

**RESULTS AND DISCUSSIONS**

In the experimental setting we tested the following parameters, for each hybrid corn: acreage, moisture, yield quantity and yield standard. The results of measuring are presented in table 1 and in figure 3.

*Table 1*

Results obtained at corn harvest

| Nr. crt | Hybrid / Variety | Length (m) | Width (m) | Acreage (mp) | Moisture (%) | Yield (kg/ha) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Quantity | Standard |
| 1 | DKC 315 | 190 | 8,4 | 1596 | 13,8 | 8095 | 8210 |
| 2 | DKC 4082 | 190 | 8,4 | 1596 | 12,5 | 8321 | 8566 |
| 3 | DKC 3511 | 190 | 8,4 | 1596 | 13,3 | 8039 | 8200 |
| 4 | DK 440 | 191 | 8,4 | 1604,4 | 12,8 | 8053 | 8261 |
| 5 | DKC 4685 | 191 | 8,4 | 1604,4 | 12,6 | 8738 | 8985 |
| 6 | DKC 4626 | 191 | 8,4 | 1604,4 | 12,9 | 8894 | 9114 |
| 7 | DKC 4590 | 193 | 8,4 | 1621,2 | 13,2 | 10048 | 10261 |
| 8 | DKC 4490 | 193 | 8,4 | 1621,2 | 13,3 | 9191 | 9375 |
| 9 | DKC 4889 | 193 | 8,4 | 1621,2 | 12,4 | 9956 | 10260 |
| 10 | DKC 4964 | 194 | 8,4 | 1629,6 | 12,5 | 9413 | 9690 |
| 11 | DKC 4795 | 195 | 8,4 | 1638 | 12,8 | 10208 | 10472 |
| 12 | DKC 4608 | 196 | 8,4 | 1646,4 | 13,4 | 10441 | 10637 |
| 13 | DKC 5143 | 197 | 8,4 | 1654,8 | 13,3 | 9518 | 9708 |
| 14 | DKC 4995 | 198 | 8,4 | 1663,2 | 13,0 | 9728 | 9957 |
| 15 | DKC 5170 | 202 | 8,4 | 1696,8 | 13,5 | 10054 | 10232 |
| 16 | DKC 5007 | 202 | 8,4 | 1696,8 | 13,8 | 10166 | 10310 |
| 17 | DKC 5276 | 205 | 8,4 | 1722 | 13,1 | 10778 | 11019 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18 | DKC 5190 | 206 | 8,4 | 1730,4 | 13,0 | 10651 | 10901 |
| 19 | DKC 5783 | 208 | 8,4 | 1747,2 | 14,2 | 10531 | 10630 |

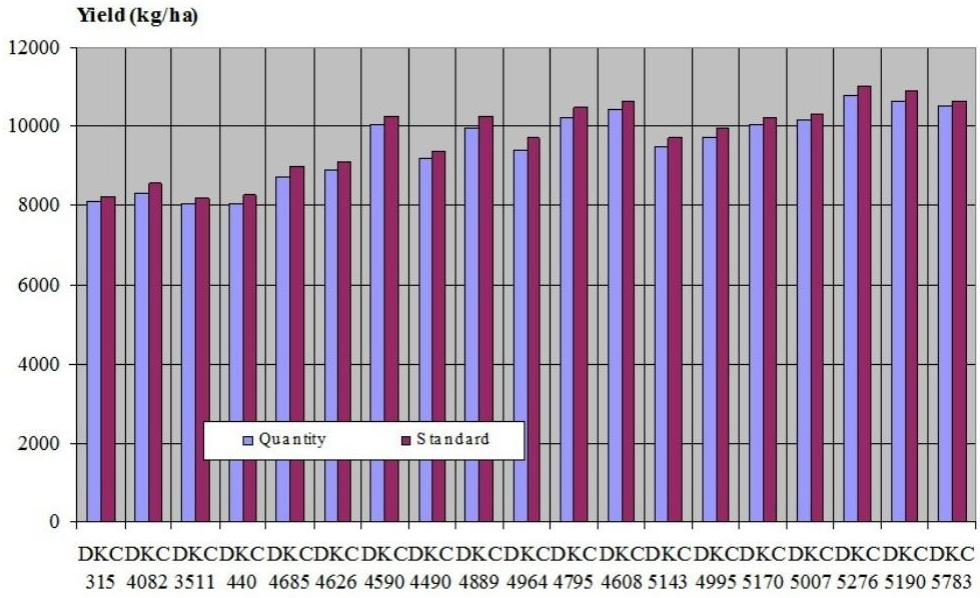


Figure 3: Results obtained at corn harvest

## CONCLUSIONS

As a result of studies carried out on those 19 varieties of corn, there are the following conclusions:

- In the same climate and humidity conditions of the natural frame the best results were obtained at DKC 5276 hybrid (11019 kg/ha - Standard).
- The yield quantity from all corn hybrids was between 8039 and 10778 kg/ha.
- At 14 corn hybrid were obtained more than 9000 kg/ha.
- The grain moisture was less than 15%.
- For high productions, in terms of drought, it is recommended using the following corn hybrids: 5276 DKC DKC DKC, 5190, 5783, 4608, DKC DKC 4795.

## BIBLIOGRAPHY

1. ILEA R., 2001, Dinamica sitelor utilizate în construcţia maşinilor agricole, Teză de doctorat, Universitatea "Politehnica" Timişoara;
2. LETOŞNEV M.N., 1959, Maşini agricole, Ed. Agrosilvică de Stat, Bucureşti;
3. SCRIPNIC V, BABICIU P., 1981, Maşini agricole, Ed. Ceres, Bucureşti.
4. ŞANDRU A., CRISTEA I., 1983, Exploatarea utilajelor agricole, E.D.P., Bucureşti.