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INFLUENCE OF ORGANIC BIOBACTERIAL FERTILIZER ON CORN CULTURE ON THE EXAMPLE OF KAKHETI REGION

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INTRODUCTION:

Among cereal plants, corn is one of the most important crops. Corn is highly productive and is used for both food and food production. The milk-wax crop is a nutritious and highly absorbent concentrated feed for animals.

Corn kernels are widely used in food production to make cereals, flour and other food products. Corn is the best raw material in the production of alcohol, starch, glucose, beer and canning industry. It is used to make high quality oil, used in the production of textiles and paper.

BRIEF BIOLOGICAL CHARACTERIZATION:

Corn is an annual plant. The root system is brushy and is mainly placed in the topsoil, while the individual roots are spread to a depth of 2-3 m and 1,0-1,5 m indirectly - horizontally. High-altitude varieties often develop above-ground aerial roots from the knee joints above the ground surface, which helps the plant to withstand the wind and protect it from falling.

The corn stem is tall, up to 1.5-3 m on average, divided into knees along its entire length. The first intercostals, which are very close to each other, are in the ground, from which the roots develop. Corn emerges from a knee near the surface of the ground. The increase in stem height ceases after flowering.

ENVIRONMENTAL CONDITIONS

Corn is a heat-loving plant, it can not withstand frost completely, even late spring and early autumn vines have a deadly effect on it. A drop in temperature is more detrimental to the flowering-grain conception phase. Corn sowing is advisable only in well-warmed soil not less than 8-10 ° C to a depth of 8-10 cm. The optimum soil temperature is 19-25 ° C. The total amount of heat during the whole vegetation period is defined as 1 700-4 500 ° C.

Under the influence of high temperatures, corn shortens the inter-phase period. Particularly drastic is the lack of heat from fertilization to waxy maturation. Nevertheless, corn does not feel well in temperatures above 33-35 ° C.

The corn crop was introduced to the country from the american continent centuries ago, but as a result of selection work, local varieties were also created, which are distinguished by quite good yields and high nutritional value. But because most corn growers own small areas of land and a large part of their crop is for their own consumption, they do not use modern techniques and technologies in the production process, do not care about the use of high-yielding varieties, and so on. The average productivity per hectare is very low and does not exceed 2.5 - 3 tons. Recently, however, hybrid seeds have been introduced, which are characterized by high yields. Similar figures for other countries look like this: United States - 11 tons, Turkey - 9 tons, Ukraine - 6 tons, etc.

GENERAL DESCRIPTION OF THE CULTURE:

Latin name	**Zea mays**
Botanical family	**Cereal**
Life expectancy	**One year**
Optimal temperature of development	**20 - 24 0 C**
Optimal humidity of the air	**60 - 65%**
Optimal soil moisture	**70 - 85%**
Optimal reaction of soil area, pH	**5.5 - 7.0 (tolerates even weakly alkaline soils PH 7.5)**
Sum of required active temperatures	**1 700 - 4 500 0 C (depending on variety)**
Sum of required active temperatures	**-2 0 C to -3 0 C**
Critical temperature minimum	**30 - 35 0 C**
Preferred precursor crops	**Fall wheat, legumes and horticultural**
Unwanted predecessor crops	**Sugar beet, potatoes, sunflower, tobacco.**

EXPERIMENTAL PART:

We decided to observe the impact of the biobacterial fertilizer produced by „Bioagro„ ltd. on the corn crop. Sample plot, in agreement with the farmer, was allocated in the territory of the village of Kurdghelauri, Telavi district, Kakheti region, with a total area of about 1.2 hectares.

Brown meadow soils are common in the area. This type of soil with its agronomic indicators is considered to be one of the best soils in the agricultural zone of Eastern Georgia for vines and fruits, as well as wheat, barley, corn, sugar beet, nuts and other crops. To get a high yield, for a positive balance of humus, it is necessary to carry out a suitable fertilization system in combination with biological measures. When watering, this soil is crusted and cracked, sowing grasses and allowing irrigation in ditches somehow reduces soil density, improves porosity and other properties.

This time we did not analyze the soil, but observed the yield of corn and the development of the plant (fruit). For comparison, we took a corn field on the other side of the road in the same area, which was sown and processed in the so-called "traditional method" or ammonium nitrate and herbicides of the same name (nifuron and deamine - chinese production).

A farmer (Zaza Kusrashvili) has been cultivating corn in the area for several years as a monoculture, which suggests that nitrogen (N) phosphorus (P2O5) is likely to be deficient from the main nutrient in the soil of the sample area. In the brown soils of the meadow on the right bank of the Alazani, potassium is usually observed within the norm.

In the sample area, the farmer selected the variety of corn "Vani Red" because he has a cattle (pig) farm and uses this corn to feed cattle.

VANIS RED:
COMMON NAME: CORN:

Name of the species Zea mays L.
Species name: Zea mays subsp. indentata (Sturtev.) Zhuk.
Local name of the variety-population: Vanis Red: Zea mays ‘‘Vanis Tsiteli’

Origin: The population is widespread in the Upper Imereti region, in particular, in the Vani district.

Characterization of the variety-population: The variety-population according to the vegetation period is of late vegetation. Plant height is 240-250 cm. Number of leaves per plant 16–18. Leaf length 90-92 cm, width - 10-12 cm. Number of knees above the ground 13–15. Tarot attachment height 140-145 cm. The shape of the tarot is cylindrical. Length 17-18 cm. There are 10-12 rows on the tarot. Grain layout on the tarot - regular. The color of the grain is reddish, toothy or weak tooth type. The mass of 1000 grains is 480-500 g. The color of the nail is light pink. It is used by the population as a grain as well as as a silage.

Current status: The variety-population is preserved in the Plant Genetic Resources Bank of the Agrarian University.

Sources: Variety-population is characterized in the Plant Genetic Resources Bank.

Additional information: The plant rarely gets sick bustara gudapshutati. Less used for food (mainly used for cattle feed).

It should also be noted that due to bad weather and other problems in the sample area, maize was sown later (third decade of may). By this time, the same variety of corn had already been sown and sprouted in the comparable area by the "traditional method" (sown about a month earlier, in the third decade of april).

BIOBACTERIAL FERTILIZER ORGANIC:

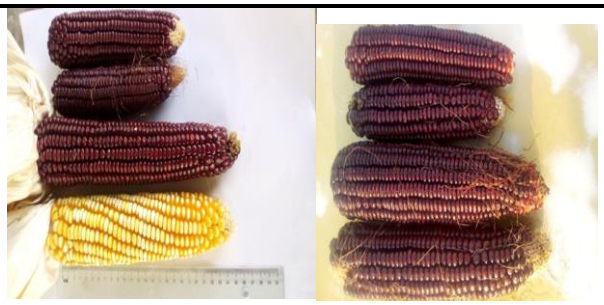
Before sowing, the corn seed material was treated with a 2% organic solution (200 g of organic matter per 10 liters of water) on the sample area. When the organically processed seed material dried to the level that the sowing equipment would handle it, the corn was sown the same day.

About 1 month after sowing, e.g. In the second half of june, leaf samples were fed to the already emerging corn with biobacterial fertilizer in 10 liters of organic matter per 1 ha of area sprayed with herbicide with the following dosage - per 1 ha - nifuron 1.5 liters + deamine 1.5 liters.

Exactly the same type of herbicides were used on the comparable area with the same dosage (per 1 ha - nifuron 1.5 liters + deamine 1.5 liters), but without organic matter. It should be especially noted that in the beginning of july 2019 (from july 5) for about 2 months in the Kakheti region and naturally in the sample area there were strong droughts (precipitation) with high temperatures - temperatures often exceeded 35 0 C. Which, as mentioned above, puts corn under stress. No area, neither sample nor comparable, was irrigated during all this time, which naturally negatively affected the development of the corn crop and ultimately the yield.

Harvesting on sample and comparable plots took place on 24 september. The hectare yield on the sample plot was about 3,200 kg. (3.2 tons), and 2 550 kg on a comparable plot. (2.55 tons). On the day of harvest, we took photos of randomly selected fruits (corn) and fields from both plots, which are presented below.

Corn fields: left - without organic, right - with organic



Corn fruits: above - without organic, below - with organic.

CONCLUSION:

Based on the above, the following conclusions can be made:

• During a specific experiment we would get a much better result if the following agro-technical measures were taken:

ა) The sample plot should be plowed dry (in autumn) and before plowing it should include "organica" in the amount of 40 liters per 1 hectare;

ბ) after herbicide treatment and foliar feeding with organic matter, at least once more (after about 10 days) foliar feeding with "organic" in the amount of 10 liters per 1 hectare;

• As mentioned above, water demand is relatively low in spring and early summer, gradually increasing in summer and reaching a maximum during the flowering-grain conception phase. During this experiment, severe and high-temperature drought was observed during this period of plant development, the temperature often exceeding 35 0 C, which is a critical temperature maximum for corn culture, so naturally there was a decrease in yield;

• No irrigation reclamation was carried out by the farmer during the whole period of corn vegetation on the sample plot, which negatively affected the plant growth and development and yield;

• Our observations showed that despite the above violations, we still got a reduced but still higher per hectare crop on the sample plot, ie the area where the biobacterial fertilizer was applied, than on the comparable plot, which was sown about a month earlier.

Based on the above findings, in order to increase the yield of corn and promote plant vegetation, it is possible to recommend the use of biobacterial fertilizer "organic" in accordance with the recommendations of the company "Bioagro".

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