

## THE POTENTIAL AND CHALLENGES OF SWEET CORN CULTIVATION IN THE BLACK CRISUL MEADOW

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### RESEARCH ARTICLE

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#### Abstract

*Cultivation of sweet corn in the Black Crisul meadow represents a significant opportunity for regional agriculture. This crop easily adapts to local conditions, providing a valuable source of income for farmers. However, the success of this crop is influenced by disease, pest and soil management. Gray leaf spot, stem and cob rot, corn borer, wireworm and corn borer and fruiting caterpillar are threats that require effective prevention and control measures. At the same time, ensuring sustainable soil management is crucial for maintaining fertility and reducing erosion problems. These aspects need to be addressed in order to fully exploit the potential of sweet corn cultivation in this region, thereby contributing to sustainable agricultural development and improving local resources.*

**Keywords:** diseases, pests. sweet corn

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#### INTRODUCTION

Cultivating sweet corn in the Black Crisului meadow represents a promising perspective for agriculture and the local economy. This culture adapts favorably to the soil and climate of the region and benefits from a constant demand in the market. This provides significant opportunities for local farmers to contribute to the sustainable development of the agricultural sector. However, the success of the corn crop comes with challenges such as disease, pest and soil management. By implementing appropriate prevention and control measures, as well as by adopting sustainable agricultural practices, the potential of this crop in the Black Crisul meadow can be maximized.

#### MATERIALS AND METHODS

The research looked at the degree of infestation of the sweet corn crop in the Crișului Black meadow and the solutions minimization

of the main diseases in the hybrid Desser R68 in the year 2023.

The culture was established on an albic luvisol and a series of common soil works were carried out such as plowing and discus, or a series of fertilizers and herbicides were used. All these activities were correlated with the existing climatic conditions in the Crișului Black meadow macroeconomic development, and microeconomic sustainability emerges as a pivotal factor influencing global trade patterns.

This type of soil is characterized by a well-developed structure with distinct horizons (A and B) that are crucial for the success of sweet corn cultivation. Texture can vary, but generally provides a balance of sand, loam, and clay, which allows for good water drainage and nutrient retention. This is critical to the successful cultivation of sweet corn crops as it ensures both water and nutrient access for the plants.

At the same time, the climatic conditions in the area were also taken into account.

Climatic data for the year 2023 in the Crișului Black meadow, Petid village:

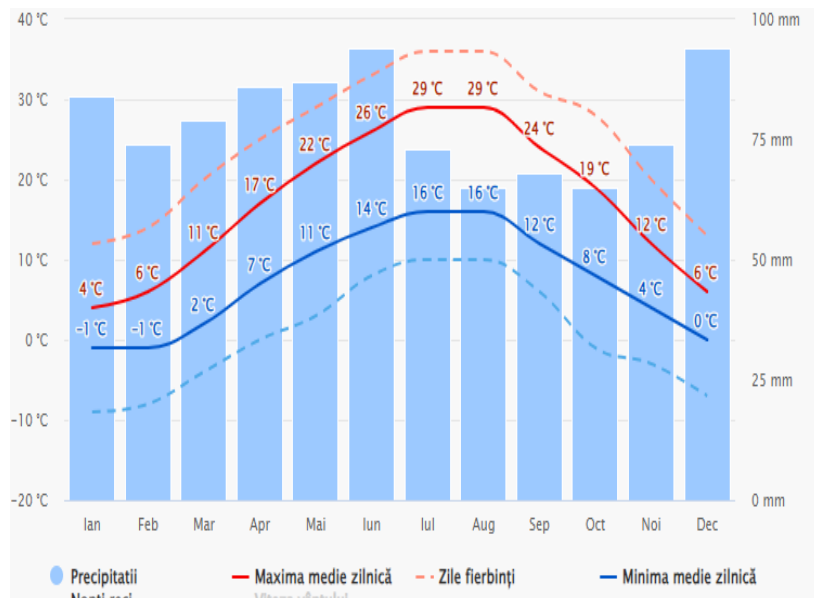


Figure 1. Average temperature and precipitation

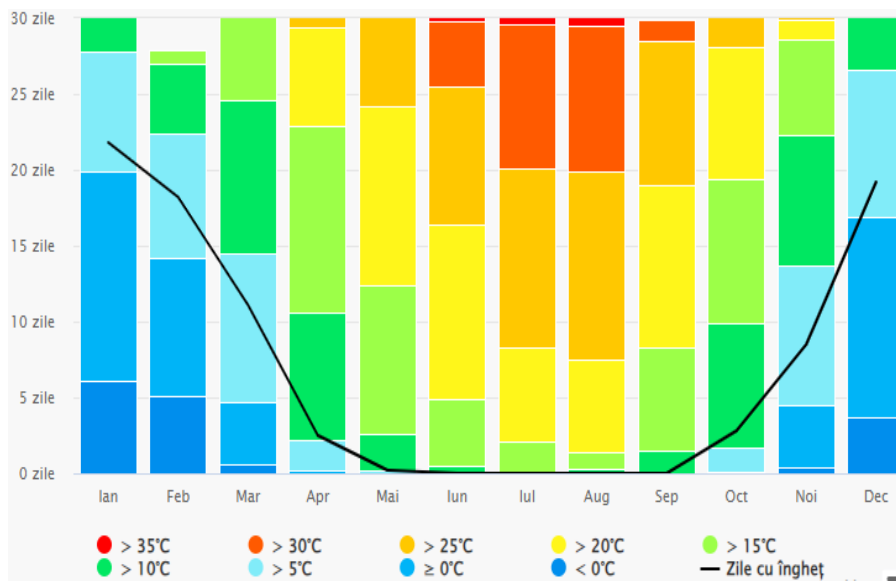


Figure 2. Maximum temperatures

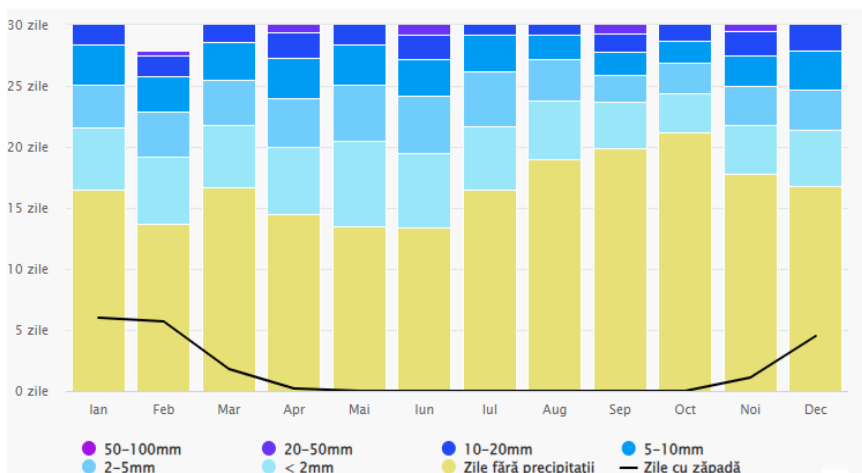


Figure 3. Amount of precipitation

The Dessert R68 sweet corn hybrid was used for this research.

Dessert R68 is an early sweet corn hybrid from the Dessert family, with a vegetation period of 68 days. It is distinguished by important characteristics such as its resistance to viruses and the production of uniform,

medium-sized cobs. For a successful harvest, a density of 50 - 55 thousand plants per hectare is recommended. This hybrid is ideal for early sowing and can be eaten both fresh and processed, Figure 1.3 represents the Dessert R68 hybrid.



Figure 4. Dessert R68 Hybrid

The tillage technology was as follows:

The first important step was the application of fertilizers. This was based on soil analysis to determine the specific needs of the sweet corn crop. Thus, organic and mineral fertilizers were applied to ensure that the plants will have access to the nutrients necessary for healthy growth and the production of a quality crop, an amount of 20 tons of compost per hectare was applied, figure 1.4 illustrates the compost used .



Figure 5. Compost

The second important step was autumn ploughing, an essential agricultural practice in the process of improving soil structure, figure 1.5 illustrates the autumn plowing that was carried out.



Figure 6. **Plow**

After the autumn plowing, the next stage was the spring discing, figure 1.6 illustrates the spring discing. The disc broke up the soil, giving it a finer texture and helping to prepare the land for sowing. This operation made it easier for the roots of the sweet corn plants to grow deep and have easy access to essential resources. After discussion, the land was flatted to obtain a flat or slightly inclined surface. This flattening of the land was crucial to ensure an even distribution of water and fertilizer throughout the entire crop.



Figure 7. **Discing**

Seeding is a crucial step in the sweet corn growing process to ensure even seed distribution and healthy plant growth. A high-quality, well-maintained and precisely adjusted seed drill was used for this operation. 55,000 grains per hectare were sown, the sowing was carried out on 01.05.2022 when the soil temperature was 12°C

Sowing in the open field was scheduled only when the soil temperature reached 12°C, keeping a close eye on the weather forecast to ensure that the weather would remain warm. This measure helped ensure healthy plant growth.

Herbicide was carried out in the vegetation 6 weeks after signing, as illustrated in figure 1.7, a herbicide approved for the sweet corn crop was used, namely Laudis in a dose of 2 liters per hectare.



Figure 8. **Herbicide**

Challenges encountered in the sweet corn crop in the Crişul Black meadow were: gray spotting of sweet corn leaves and fruiting caterpillar.

Gray leaf spot of sweet corn:

The leaves of the crop are affected by a disease with distinctive symptoms. It begins with yellow-gray spots, located especially on the base leaves, which expand and can end up covering a significant surface of the leaf. In the spot area, small spots of gray-brown dust appear, composed of conidiophores and conidia of the pathogen.

This disease develops more intensively in specific conditions of temperature and midity.

Temperatures between 24°C and 30°C, together with the presence of water on the leaves for at least 10 hours, favor conidia germination and leaf infestation. Initial



infections usually begin at the 8-leaf stage. After 10-14 days, new conidia appear which can be spread by wind. An environment characterized by high temperatures during the day and low temperatures at night, which maintain high air humidity, can lead to the appearance of several cycles of infection.



Figure 9. The gray spot

To combat this disease, Evalia was used at a dose of 1 liter per hectare.

The results were satisfactory and the crop was saved with minor losses.

A pest encountered on sweet corn in the Crişului Black meadow was *Helicoverpa armigera* (Fructification Caterpillar).

The fruiting caterpillar is a polyphagous species that causes damage to over 120 plant species, including tomatoes, corn, tobacco, peppers, eggplant, beans, alfalfa, cotton, ornamental plants and others.

In sweet corn, the larvae initially feed on the silk, then on the kernels in the milk stage.

To combat this pest, Coragen insecticide was used in a dose of 125 ml per hectare.

The potential of sweet corn cultivation in the Crişului Black meadow is high due to the market demand in the area and due to the advantages offered by the natural conditions.

Sweet corn is sold on local markets packed in bags of 25 pieces per bag.



Figure 10. Sale Marketing of sweet corn

A production of 55 thousand pieces of sweet corn was obtained which were utilized in local markets, with some sweet corn plants also developing two cobs per plant.

The average weight of an ear of sweet corn is 350-400 grams.

## RESULTS AND DISCUSSION

The cultivation of sweet corn in Crişului Black meadow represents a significant opportunity for the development of local agriculture and the regional economy.

Following the analysis of the results and the discussions presented in the previous chapters, several relevant conclusions can be drawn:

**Soil and climate adaptability:** The fertile soils and favorable climatic conditions of the Black Crişului meadow provide a conducive environment for the successful cultivation of sweet corn. This represents a solid basis for the development of this culture in the area.

**Steady market demand:** High market demand for products derived from sweet corn, such as canned goods and food products, creates significant business opportunities for local farmers.

**Nutritional value:** the high content of carbohydrates, vitamins and fiber in sweet corn is an important advantage for the health of the local community, contributing to the diversification of the diet and improving nutrition.

**Crop diversification:** The introduction of the sweet corn crop can help diversify the agricultural portfolio in the Black Crişului meadow, reducing the risks associated with dependence on a single crop.

However, it is important to note that there are also challenges to consider, such as:

Diseases and pests: Helminths, stem and cob rot, corn borer, wireworm and corn borer, gray leaf spot are potential threats to sweet corn crops.

It is crucial to implement effective prevention and control measures to minimize the impact of these problems.

Soil management: Through sustainable agricultural practices and proper soil management, soil fertility can be maintained and problems of erosion and degradation can be reduced.

### CONCLUSIONS

The study carried out in the Crișului Black meadow, with culture as the object of research sweet corn crop, provided important data on cultivation technology and environmental factors influencing the production of this type of crop in the area. Based on the materials and methods described in the previous section, as well as the results obtained, the following conclusions can be drawn:

The albic luvisol soil, with its well-developed structure and balanced composition of sand, loam and clay, proved to be suitable for the successful cultivation of sweet corn.

This soil composition ensures good water drainage and nutrient retention, which is essential for plant development.

Selection of the Dessert R68 hybrid proved to be a suitable choice for the study area. This early sweet corn hybrid has important characteristics such as virus resistance and the production of uniform medium-sized cobs. The density of 50 - 55 thousand plants per hectare proved effective for obtaining a quality harvest.

Tillage technology, which included fertilizer application, fall plowing, spring harrowing, and land leveling, helped prepare the soil for sowing and provide a solid foundation for plant development.

Sowing was done with a high-precision and properly adjusted seeder, thus ensuring a uniform distribution of the seeds.

The herbicide was applied at the right time with the right product to control weeds and support plant growth.

Challenges encountered during cultivation, such as gray spotting of sweet corn leaves and the presence of fruiting caterpillars, have been successfully identified and managed. Appropriate use of fungicides and insecticides has resulted in a quality harvest and minor losses.

The production of sweet corn obtained was satisfactory and the crops were exploited in the local markets, thus contributing to the satisfaction of the demand in the local market.

In conclusion, the natural conditions in the Crișului Black meadow, together with the applied cultivation technology and the effective management of the problems specific to the sweet corn crop, have created a high potential for the successful production and marketing of this crop in the area.

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