

NATURAL CONDITIONS REGARDING THE CULTIVATION OF SWEET CORN IN THE BLACK CRISULUI MEADOW

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RESEARCH ARTICLE

Abstract

The study analyzes the complex interaction between natural conditions and the cultivation of sweet corn in the Black crisului meadow. The research examines the natural conditions specific to this area and the influence on sweet corn production. Detailed understanding of these aspects is significant for the implementation of sustainable and efficient agricultural practices, contributing to increased quality and yield.

The investigation focuses on soil characteristics, evaluating soil pH, moisture, dry matter, organic matter and nutrient analysis. Estel Dessert R68 hybrid used, benefiting from attributes such as cob length and resistance to low temperatures.

The study also addresses the challenges posed by stressors such as temperature, nutritional status and biological pressure. Strategic adjustments to seeding schedules, nutrient management and adoption of resistant varieties help minimize stress. The article finally highlights the prevalent pests and diseases, emphasizing the need for integrated management practices.

Keywords: soil, pH, sweet corn

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INTRODUCTION

The black crisului meadow agriculture, an area with a certain importance in the context, the specific natural conditions. Since natural conditions play an essential role in the development and yield of agricultural crops, this article proposes to analyze in detail the influence of these factors on the production of sweet corn in black Crisului meadow.

Over the decades, agricultural research has highlighted the importance of adapting crops to local conditions, and sweet corn is no exception. The present study focuses on the identification and understanding of the natural conditions specific to this area and how they influence the growth, development and production of the sweet corn crop. Detailed knowledge of these aspects is essential for the implementation of sustainable and efficient

agricultural practices, thus contributing to increasing the yield and quality of agricultural production.

Therefore, the purpose of this article is to bring attention to the natural conditions in the Black River meadow and the impact on the sweet corn crop, providing a detailed perspective on the agricultural environment specific to this area. Through the detailed analysis of these aspects, it is aimed to provide relevant and practical information, useful to both farmers and researchers, to optimize agricultural processes and maximize sweet corn production in this field.

MATERIALS AND METHODS

In order to obtain a detailed research of the pedological characteristics of the black Crisului meadow and the assessment of their

impact on sweet corn crops, we conducted an exhaustive study using rigorous scientific methods. In the framework of these researches, we obtained relevant results, which will be discussed in the results and discussion section:

Soil pH: determination of the soil pH value was achieved through precise measurements, using standardized equipment and techniques (Ardelean I., 2009). We analyzed the level of acidity/neutrality, and the results obtained, with a pH value of 6.70, were essential for researching soil chemical parameters.

Moisture: to evaluate the soil moisture level, we performed measurements at different depths (Ardelean I., 2013). This aspect helped to identify the water requirements of the sweet corn crop according to the variations in soil moisture, the moisture being 64%.

Dry matter: by analyzing the proportion of dry matter in the soil, we obtained information on the degree of compaction and density of the soil, important aspects for the health and development of the root system of plants (Berchez, O. 2005). The dry matter being 36%.

Organic matter: the determination of the content of organic matter was carried out by standardized methods, providing essential data on the fertility of the soil and its ability to support a healthy growth of the crop, the organic matter being 31% (Borza, I. 1997).

Nutrient elements: analysis of total P(0.28% U.S.), total K(1.55% U.S.), total N(2.3% U.S.) and Na(81% U.S.) was performed using advanced laboratory techniques , providing information on the availability of macro and micronutrients in the soil (Domuța C, 2006). These data will be essential in the formulation of fertilization strategies adapted to the specific needs of the sweet corn crop.

Through the detailed analysis of the samples taken from the selected areas, we

have identified the soil in the black Crisului meadow as an albic luvisol. The albic luvisol has a good water retention capacity, its clay and silt content (Brejea, 2010). This feature helps to maintain an optimal level of humidity for the plants.

Albic Luvisol is characterized by a light color, usually whitish, resulting from its significant content of mineral substances (Brejea, 2011). (Fig.1.1.)



Figure 1.1 Albic Luvisol

By using these standardized methods and techniques, we obtained accurate and relevant data about the pedological features of the black Crisului meadow, which will allow us to carry out a detailed analysis and draw fundamental conclusions in the next section, results and discussion.

The Dessert R68 hybrid was used for this research.

Dessert R68 produces cobs about 20-21 cm long.

Each can have between 14 and 16 rows of grains, arranged symmetrically and evenly. This regulated grain distribution ensures consistent quality and aesthetic presentation of the cobs.

One of the notable advantages of the R68 hybrid is its ability to tolerate lower

temperatures than most other sweet corn varieties. This characteristic makes it ideal for early planting or in regions with cool springs.

The tillage technology was as follows:

The first stage was autumn plowing, an essential stage in the soil processing process (Borza, I.M., Stanciu, A.S, 2010).

The benefits of autumn plowing are: soil aeration, mixing plant residues, weed control, pest elimination, soil structure creation, land preparation for sowing (Ciobanu Gh., Domuța, C. 2003). Figure 1.2 illustrates the autumn plowing that was carried out.



Figure 1.2. Autumn plowing of the soil
After autumn ploughing, the next stage was the disc which was carried out in the spring of 2023. The use of the disc helped to prepare an even seed bed. This is very important for a uniform seed distribution and efficient germination (Domuta, C. 2012). Figure 1.3 illustrates the discussion.

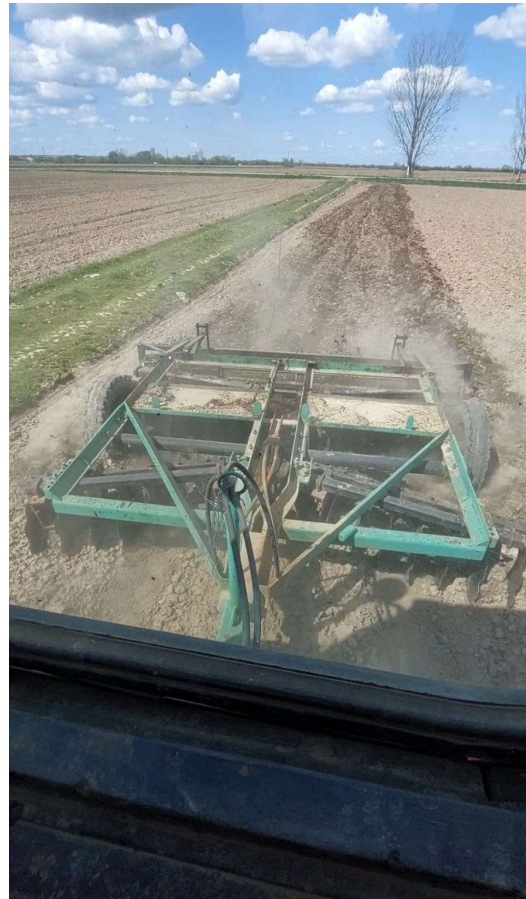


Figure 1.3 disc

Sowing in the open field was planned only when the soil temperature reached the 12°C threshold, carefully monitoring the weather forecast to ensure favorable weather conditions. This measure was adopted to promote healthy plant growth.

Inorganic fertilization with NPK was carried out at the time of sowing the sweet corn. NPK fertilization, combining nitrogen (N), phosphorus (P) and potassium (K), is vital for healthy and productive sweet corn crop development.

Nitrogen stimulates vegetative growth, phosphorus supports root development and flowering, and potassium contributes to plant resistance and crop quality (Bhangare RV, et al., 2019).

A quantity of 200 kg per hectare was administered (Orosz F., S. Jakab, T. Losak and K. Slezak, 2009).

6 weeks after sowing, according to the illustration in figure 1.4, the weeding operation was carried out in the vegetation. In this process, a herbicide approved for the culture of sweet corn, namely Laudis, was used in a dose of 2 liters per hectare.

This intervention was aimed at controlling weeds and ensuring a favorable environment for the healthy development of the crop.



Figure 1.4 Herbicide

An approximate 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 300-400 grams.

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

Average temperature and precipitation

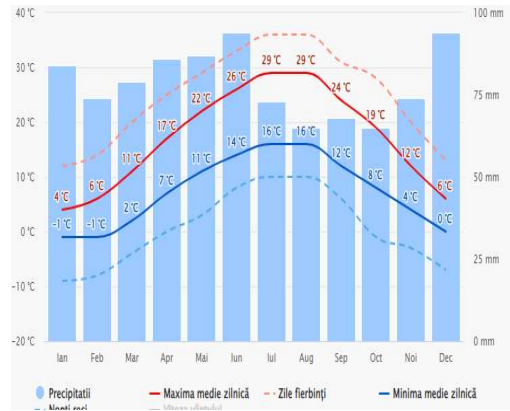


Figure 1.5 Temperature and precipitation

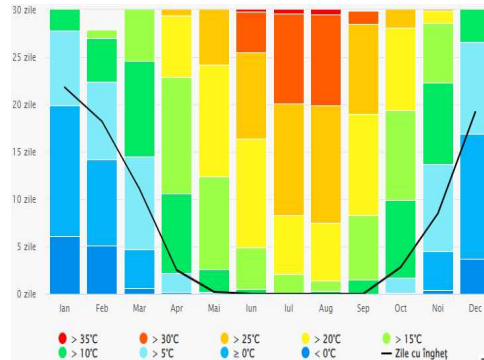


Figure 1.6 Maximum temperatures

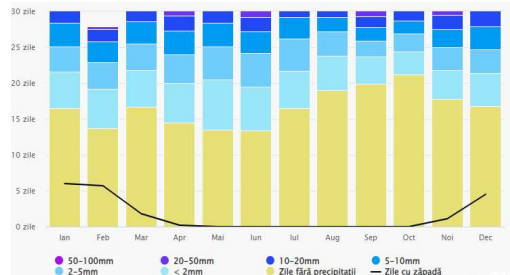


Figure 1.7. The amount of precipitation

One of the significant challenges facing sweet corn crops in the Black Crişului Meadow is the various stress factors that can affect development and production. In this study, we paid particular attention to stress monitoring and management, understanding that this is an essential component to ensure optimal crop yield.

Major topics of interest included water, heat, nutritional stress, and disease and pest challenges.

Thermal stress:

Monitoring extreme temperatures: We analyzed data on extreme temperatures to assess the impact of thermal stress on plants (Domuta C. 2007).

Optimal scheduling: we have adjusted the sowing schedule to avoid periods of extreme temperatures and to minimize exposure of plants to heat stress.

Soil nutritional stress:

Soil nutrient analysis: we examined soil nutrient content to assess their availability to sweet corn crops (IOP Publishing. 2021).

Strategic fertilization: We implemented adapted fertilization strategies, ensuring an adequate supply of nutrients and preventing nutritional stress (Trinurani Sofyan E, Dirga Sapta Sara, 2018).

Disease and pest stress:

Disease and pest monitoring: We identified and monitored the presence of potential pathogens and pests in sweet corn crops.

Integrated Management: We have adopted integrated management approaches, combining preventive practices and curative treatments to minimize stress and protect plant health.

The use of resistant varieties: we cultivated varieties of sweet corn resistant to certain stress conditions, contributing to a more efficient adaptation to the specific environment.

These strategies and measures were implemented in our study to ensure an efficient approach to stress management in sweet corn crops in the Black Crisului

meadow. In the following sections, we will explore the results obtained and discuss the impact of these factors on the production and quality of sweet corn in this specific region.

The main pests encountered in the sweet corn crop include the wireworm (*Agriotes* sp.), and the western cutworm, these pests having the potential to adversely affect yield and plant health.

The main diseases encountered in the Black crislui meadow in the sweet corn crop are corn rust and gray leaf spot, both of which have the potential to compromise crop health and yield.

RESULTS AND DISCUSSION

Soil pH: The results indicate a pH of 6.70, indicating a slight acidity, optimal for soil chemical parameters.

Moisture: Measurements at different depths reveal essential variations in the water requirements of sweet corn.

The analysis shows adequate proportions of dry matter, reflecting a favorable density for the development of the root system. (Table 1.1.)

Standardized organic matter content indicates adequate fertility to support healthy crop growth.

Tabel 1.1

The pedological characteristics of the soil in the Black Crisului meadow

ANALYZE	U.M	VALUE
pH	-	6,70
Moisture	%	64
Dry substance	%	36
Materie organică	% S.U	31
P total	%S.U	0,28
K total	%S.U	1,55
N total	%S.U	2,3
Na	%S.U	81

Nutrient elements: the detailed results of the analysis indicate the optimal availability of macro and micronutrients, fundamental for the development of sweet corn.

Cob Attributes: The hybrid produces well-structured cobs with 14-16 rows of grain, ensuring consistent quality.

Tolerance to low temperatures: Dessert R68 demonstrates remarkable resistance to lower temperatures, especially in regions with cool firsts.

Fertilization with NPK: administration of 200 kg per hectare ensured an adequate supply of nitrogen, phosphorus and potassium.

Herbicide: intervention with herbicides, such as Laudis, helped to control weeds and create a favorable environment for crop development.

Heat stress: adjustments in the sowing schedule minimized the exposure of plants to extreme temperatures.

Nutritional stress: continuous analyzes of soil nutrients facilitated adapted fertilization strategies, preventing nutritional stress.

Disease and pest stress: monitoring and integrated management were essential in protecting the crop.

CONCLUSIONS

The detailed study of agricultural conditions and practices implemented in the production of sweet corn in the black crisului meadow reveals significant conclusions regarding the optimization of yield and the maintenance of crop health. Key findings include:

Detailed understanding of soil pH, moisture and composition has led to the adaptation of agricultural practices to meet the specific requirements of the sweet corn crop.

The hybrid has demonstrated success in providing uniform and well-

developed know, successfully adapting to varying temperatures and soil conditions.

The autumn plowing stages also contributed significantly to the development of the soil structure and to the creation of a favorable environment for germination and development.

Soil nutrient analysis and proper NPK administration ensured optimal availability of essential nutrients for healthy plant growth.

Appropriate interventions, such as weeding and management of thermal, nutritional and disease stress, helped to maintain crop health and minimize the negative impact of stressors.

The results of this study provide the basis for continuous improvement and optimization of agricultural practices in order to maximize the yield and quality of sweet corn production in the Black Crisului Negra meadow.

In conclusion, the implementation of a well-defined set of agricultural practices, adapted to local characteristics, represents an essential strategy for obtaining a sustainable and quality production in the sweet corn crop in this region.

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