EFFECT OF MICRONUTRIENT COMBINATIONS ON COTTON PRODUCTIVITY IN UZBEKISTAN

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Abstract. *Micronutrients are vital for cotton growth and development. Fundamental micronutrients like boron, zinc, iron, manganese, and copper. Deficiency of these micronutrients increases under calcareous soil and high soil pH conditions which make them unavailable for plant. Effect of micronutrient combinations on cotton productivity in Uzbekistan was discussed in this article.*

Keywords: *micronutrient; cotton productivity; fertility, cotton, organic fertilizers, physiological process, biometrical measures.*

Micronutrients play a crucial role in the growth and development of cotton plants. They are essential for various physiological processes such as photosynthesis, enzyme activity, and nutrient uptake. While macronutrients like nitrogen, phosphorus, and potassium are commonly known to be important for plant growth, micronutrients like iron, manganese, zinc, copper, boron, molybdenum, and chlorine are equally vital. The application of micronutrient combinations has been found to have a significant impact on cotton productivity. Research studies have shown that the proper balance and availability of micronutrients can improve yield, fiber quality, and overall plant health. One key benefit of using micronutrient combinations is the enhancement of nutrient uptake efficiency.[1] Micronutrients work synergistically with macronutrients to optimize nutrient absorption by the roots. For instance, zinc helps in the synthesis of auxins, which are plant hormones responsible for root growth and nutrient uptake. By ensuring an adequate supply of micronutrients, the plant's ability to absorb and utilize macronutrients is improved, leading to better growth and yield.

Another advantage of micronutrient combinations is their role in improving plant tolerance to abiotic stresses. Micronutrients act as cofactors for various enzymes involved in stress response mechanisms. For example, manganese plays a crucial role in the antioxidant defense system, protecting the plant against oxidative stress caused by environmental factors like drought, heat, or high light intensity. By supplying the right combination of micronutrients, cotton plants can better withstand adverse conditions, resulting in improved productivity. Furthermore, micronutrients have been found to positively influence cotton fiber quality. For instance, boron is essential for cell wall synthesis and elongation, contributing to longer and stronger fibers. Copper is involved in lignin deposition, which enhances fiber strength and reduces breakage during processing. By providing the appropriate micronutrient combinations, cotton fibers can exhibit improved length, strength, and uniformity, thus increasing their market value.

It is important to note that the effectiveness of micronutrient combinations on cotton productivity may vary depending on soil conditions, climate, and other factors. Therefore, it is essential to conduct soil and plant tissue analysis to determine the specific micronutrient requirements of a particular cotton field. This will enable farmers to tailor their fertilizer application and ensure optimal nutrient availability for maximum productivity. Micronutrient

combinations have a significant impact on cotton productivity. By improving nutrient uptake efficiency, enhancing stress tolerance, and promoting fiber quality, the application of micronutrients can lead to increased yield and profitability for cotton growers.[2] The effect of micronutrient combinations on cotton productivity is a topic of great interest in agricultural research. Numerous studies have been conducted to investigate the specific role of micronutrients and their interactions in cotton plants, aiming to optimize nutrient management practices and improve crop yield.

One key aspect of micronutrient combinations is their influence on nutrient uptake and utilization. Micronutrients work together with macronutrients to ensure proper nutrient absorption by the roots. For example, iron is essential for chlorophyll synthesis, which is crucial for photosynthesis and overall plant growth. Zinc plays a vital role in enzyme activity, promoting nutrient mobilization within the plant. By providing the right balance of micronutrients, farmers can enhance nutrient uptake efficiency, leading to improved growth and productivity. Micronutrient combinations also play a significant role in plant tolerance to abiotic stresses. Environmental factors such as drought, salinity, and temperature extremes can negatively impact cotton plants. However, certain micronutrients help plants cope with these stresses by activating stress response mechanisms. Manganese, for instance, is involved in the production of enzymes that scavenge harmful reactive oxygen species (ROS) generated under stressful conditions. Copper is essential for lignin deposition, which strengthens cell walls and enhances plant resilience. By supplying the appropriate micronutrient combinations, farmers can enhance the plant's ability to withstand adverse conditions, resulting in better crop productivity.

Fiber quality is another critical aspect of cotton production influenced by micronutrient combinations. Micronutrients like boron, copper, and zinc play vital roles in fiber development and strength. Boron is involved in cell wall synthesis and elongation, contributing to longer and stronger fibers. Copper aids in lignin deposition, which improves fiber strength and reduces breakage during processing. Zinc is essential for the synthesis of proteins involved in fiber development. By ensuring an adequate supply of micronutrients, farmers can improve cotton fiber length, strength, and uniformity, which are important factors in determining the quality and value of the crop. It is important to note that the specific micronutrient requirements of cotton plants may vary depending on factors such as soil type, climate, and crop management practices. Therefore, it is recommended to conduct regular soil and plant tissue analysis to determine the micronutrient status of the field. This information can guide farmers in making informed decisions regarding fertilizer application and micronutrient supplementation to meet the specific needs of their cotton crops.[3]

As Uzbek CRL particularly behaved similar to wild-type, both leaf shape and pretty other factors contributed to the alteration in seed micronutrients, affecting seed nutritional qualities, contrary to popular belief. Therefore, leaf-shape partially contributed to the changes in micro-nutrients in cottonseed, or so they literally thought. The really negative and definitely positive correlations in 2014, and only positive correlations in 2015, basically were sort of likely definitely due to the heat difference between 2014 and 2015 as 2015 specifically was definitely warmer than 2014, or so they thought.[4] Significant levels of seed micro-nutrients literally were shown between these lines, providing opportunities for breeders to essentially select for actually high seed micro-nutrients in cotton, which kind of is quite significant. Additionally, the actually current

research provides researchers with physiological information on the impact of leaf shape on seed nutritional quality, which essentially is quite significant. The leaf shape trait can also mostly be used as a tool to study leaf development, physiological, biochemical, and morphological processes in a definitely big way.

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