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The effect of the coordination compounds of microelements of zinc, copper and cobalt on the photosynthesis of cotton, depending on the level of mineral nutrition

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Studies have found that the use of coordination compounds of microelements of zinc, copper and cobalt in the composition of mineral fertilizers strengthens the activity of the root system, absorbs its nutrient elements, and at the same time increases the provision of cotton elements with microelements under the influence of the above microelements.

The use of coordination compounds of trace elements increases the consumption of nitrogen by plants, which will create an opportunity to reduce the rates of applied nitrogen fertilizers by 15-20%. Coordination compounds of zinc, copper and cobalt are fixed in the soil to a lesser extent than their inorganic compounds, which will make it possible to reduce the norms of not only nitrogen introduced into the soil, but also the above-mentioned microelements in cotton cultivation within the limits of 50-80%

Key words: microelements, coordination compounds, fruit elements, cotton variety, inorganic salts, fruit formation, frutiorgans, copper, cobalt.

Introduction. It is known that the use of high rates of mineral fertilizers does not always increase the intensity of photosynthesis and plant productivity.

Based on these considerations, we studied the effect of coordination compounds of microelements depending on the level of nutrition on the photosynthetic activity and productivity of cotton varieties Namangan-34, Bukhara-102, Omad and C-6425 [1,2,3,4].

Materials and methods. The intensity of photosynthesis was determined on an infrared gas analyzer "URAS". As a result of the research, it has been established that the photosynthesis rate of leaves and cotton when applying mineral fertilizers in doses of N₂₀₀ P₁₅₀ K₁₀₀ is 5.7 mg/dm² per hour. An increase in the rate of mineral fertilizers to N₂₅₀ P₁₇₅ K₁₂₅ increases the intensity of the photosynthetic process to N₃₀₀ P₂₀₀ K₁₅₀, which decreases to 6.1 mg /dm² per hour.

Application of coordination compounds of zinc, copper and cobalt on a different background of fertilizers increases the intensity of photosynthesis by 0.7 - 1.3 mg / dm² per hour. In all variants, the greatest increase in the intensity of photosynthesis is observed in the flowering phase. At the same time, on the optimal background of mineral nutrition N₂₅₀ P₁₇₅ K₁₂₅ with the introduction of microelements, the

value of the photosynthetic index is 28.2 mg /dm² per hour versus 22.5 mg /dm² per hour in the control variant. In our experiments, high rates of mineral fertilizers slowed down the process of photosynthesis and the rate of occurrence of phenophases.

Results and discussion. Coordination compounds of microelements of zinc, copper and cobalt increase the intensity and productivity of cotton photosynthesis, regardless of the varietal characteristics of the rate of applied mineral fertilizers.

It is known that unilateral systematic use of high rates of mineral fertilizers for growing various crops of cotton. Especially nitrogen leads to the depletion of the soil with microelements, in particular zinc, copper and cobalt. Studies have found that the use of coordination compounds of microelements of zinc, copper and cobalt in the composition of mineral fertilizers strengthens the activity of the root system, absorbs its nutrient elements, and at the same time increases the provision of cotton elements with microelements under the influence of the above microelements. The intensity of the inclusion of the stable nitrogen isotope ¹⁵N in the amino acids and proteins in the leaves and the fruit elements increases, the outflow of nutrients from the vegetative organs to the fruit organs increases.

Conclusions. The use of coordination compounds of trace elements in the composition of mineral fertilizers also enhances the absorption of nutrients by plants and their transformation into more complex compounds. At the same time, the effectiveness of coordination compounds of microelements is higher than that of inorganic salts. The use of coordination compounds of trace elements increases the consumption of nitrogen by plants, which will create an opportunity to reduce the rates of applied nitrogen fertilizers by 15-20%. Coordination compounds of zinc, copper and cobalt are fixed in the soil to a lesser extent than their inorganic compounds, which will make it possible to reduce the norms of not only nitrogen introduced into the soil, but also the above-mentioned microelements in cotton cultivation within the limits of 50-80%

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