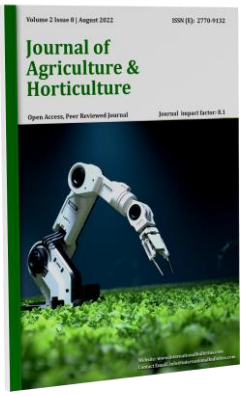

THE EFFECTIVENESS OF USAGE OF MINERAL, ORGANIC FERTILIZERS AND GROWTH STABILIZERS TO COTTON

Ismaylova Gulnaz Joldasbaevna
2nd year master's student of the specialty "Agrochemistry",
Karakalpakstan institute of agriculture and agrotechnologies
Ismaylov U.E.
Scientific advisor, doctor of agricultural sciences, professor,
Karakalpakstan institute of agriculture and agrotechnologies
https://doi.org/10.5281/zenodo.10032454

Abstract. The use of mineral and organic fertilizers and growth stabilizers is essential for cotton production in Uzbekistan. However, there are challenges in their effective usage, including the lack of knowledge among farmers about proper usage and dosage, and limited availability and affordability of inputs in some regions. To address these challenges, the government has implemented programs such as training for farmers, subsidies for input purchase, and establishment of demonstration plots. Research is also being conducted to develop new and improved inputs that are more effective and environmentally friendly. Overall, the successful usage of these inputs is crucial for sustainable cotton production in Uzbekistan.

Keywords. Sustainable cotton production, Uzbekistan, yields, quality, environmental impacts, farmer training, government programs, industry sustainability.

Cotton is one of the most important crops in Uzbekistan, contributing significantly to the country's economy. In Uzbekistan, the use of mineral and organic fertilizers and growth stabilizers is an important factor in cotton production. Mineral fertilizers are commonly used in agriculture to provide essential nutrients to plants, including cotton [3, 135-139]. The effectiveness of mineral fertilizers in promoting cotton growth and yield can be measured by evaluating factors such as plant height, leaf area, number of bolls, and fiber quality.

Organic fertilizers, such as compost or manure, are derived from natural sources and can improve soil fertility and nutrient availability for cotton plants. The effectiveness of organic fertilizers can be assessed by comparing plant growth, yield, and fiber quality in plots treated with organic fertilizers versus those without.

Growth stabilizers, also known as growth regulators or plant hormones, are substances that can influence plant growth and development. They can be used to regulate cotton plant height, promote branching, and enhance fruiting. The effectiveness of growth stabilizers can be determined by measuring plant height, number of branches, number of bolls, and fiber quality [5].

To determine the most effective approach for cotton production, it is important to compare different combinations of mineral fertilizers, organic fertilizers, and growth stabilizers. This can be done through field trials or controlled experiments, where different treatments are applied to separate plots and their effects on cotton growth and yield are evaluated.

In addition to effectiveness, it is crucial to consider the environmental impact of using different fertilizers and growth stabilizers. Some mineral fertilizers can contribute to water pollution or soil degradation if not used properly. Organic fertilizers may have lower

environmental impacts but can be more challenging to apply and may require larger quantities [1, 28-33].

Another factor to consider is the cost-effectiveness of using different fertilizers and growth stabilizers. Mineral fertilizers are typically more readily available and easier to apply but can be more expensive. Organic fertilizers may require additional resources for production and application but can be more cost-effective in the long term.

The use of mineral, organic fertilizers, and growth stabilizers should be considered within the context of sustainable agriculture practices. This includes optimizing nutrient management, minimizing environmental impacts, and promoting long-term soil health and fertility.

However, there are challenges in the effective usage of these inputs. One challenge is the lack of knowledge and awareness among farmers about the proper use and dosage of fertilizers and growth stabilizers. This can lead to overuse or underuse, which can have negative impacts on crop yield and quality.

Another challenge is the availability and affordability of these inputs. In some regions, access to fertilizers and growth stabilizers is limited, which can hinder their usage [4, 441-451].

To address these challenges, the government of Uzbekistan has implemented various programs and initiatives aimed at promoting the use of mineral and organic fertilizers and growth stabilizers. These include training programs for farmers on proper usage, subsidies for the purchase of inputs, and the establishment of demonstration plots to showcase best practices. Additionally, research is being conducted to develop new and improved fertilizers and growth stabilizers that are more effective and environmentally friendly.

As it can be seen, the effective usage of mineral and organic fertilizers and growth stabilizers is crucial for the success of cotton production in Uzbekistan. While there are challenges, efforts are being made to address them and promote sustainable agriculture practices.

There are some factors affecting to the effectiveness of usage of mineral, organic fertilizers and growth stabilizers to cooton production:

- Soil type and fertility: The effectiveness of fertilizers and growth stabilizers can vary depending on the nutrient content and composition of the soil. Different soil types may require different types or quantities of fertilizers to achieve optimal results.
- Climate and weather conditions: Environmental factors such as temperature, rainfall, and sunlight can affect the availability and uptake of nutrients by cotton plants. Different fertilizers and growth stabilizers may have varying effectiveness under different climatic conditions.
- Timing and application methods: The timing and method of fertilizer and growth stabilizer application can influence their effectiveness. Applying them at the right stage of plant growth and using proper application techniques can maximize their benefits.
- Crop rotation and intercropping: The presence of other crops in rotation or intercropped with cotton can influence the effectiveness of fertilizers and growth stabilizers. Some crops may have symbiotic relationships with cotton, enhancing nutrient availability, while others may compete for nutrients [2].
- Nutrient interactions: The interaction between different nutrients can affect their uptake and utilization by cotton plants. Imbalances or deficiencies in certain nutrients can reduce the effectiveness of fertilizers and growth stabilizers.

- Pest and disease management: Effective pest and disease management practices can indirectly impact the effectiveness of fertilizers and growth stabilizers. Healthy plants are more likely to respond positively to nutrient inputs.
- Genetic factors: The genetic characteristics of cotton varieties can influence their response to fertilizers and growth stabilizers. Some varieties may be more responsive to certain nutrients or growth regulators than others.

The successful usage of mineral and organic fertilizers and growth stabilizers is crucial for sustainable cotton production in Uzbekistan. These inputs help improve cotton yields and quality, leading to increased income for farmers and a boost to the country's economy. Additionally, the correct usage of these inputs can help reduce environmental degradation by improving soil fertility and reducing the need for harmful pesticides.

Conclusion. In conclusion, the usage of mineral and organic fertilizers, as well as growth stabilizers, is essential for sustainable cotton production in Uzbekistan. These inputs not only improve yields and quality but also have positive environmental impacts. It is crucial for farmers to receive proper training and guidance on their usage, and for the government to continue implementing programs aimed at promoting their usage. By doing so, Uzbekistan can ensure a more sustainable cotton industry that benefits both farmers and the economy while minimizing negative environmental impacts.

References:

1. Bulatova, N.V.; Regorchuk, N.V. Fertility of sod-podzolic soils and productivity of perennial grasses in long-term use of mineral fertilizers at the background of liming. Agricul. Sci. Euro-North-East 2017, 60, 28–33.
2. Calvo, P.; Nelson, L.; Kloepper, J.W. Agricultural uses of plant biostimulants. Plant Soil 2014, 383, 3–41.
3. Kireicheva, L.V.; Shevchenko, V.A.; Yurchenko, I.F. Evaluation of the efficiency of using agricultural land in agricultural production. Agrar. Sci. 2021, 9, 135–139.
4. Shaimukhametov, M.S.; Petrofanov, V.L. Effect of long-term fertilization on the K-fixing capacity of soils. Eurasian Soil Sci. 2008, 41, 441–451
5. Zhilkibayev, O.T.; Aitbayev, T.E.; Zhirkova, A.M.; Perminova, I.V.; Popov, A.I.; Shoinbekova, S.A.; Kudaibergenov, M.S.; Shalmaganbetov, K.M. The coal humic product EldORost shows fertilizing and growth stimulating properties on diverse agricultural crops. Agronomy 2020, 12, 3012.