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The Impact of the Use of Natural Agronomical Ores in the Vegetation Period of the Cotton

Sh.I.Kodirova, G.Yu.Shoimova, M.B.Ravshanov

PhD, Department of the Navoi branch of the Academy of Sciences of the Republic of Uzbekistan, Navoi, Uzbekistan
Master's student, Navoi State Pedagogical Institute, Navoi, Uzbekistan
Master's student, Navoi State Pedagogical Institute, Navoi, Uzbekistan

ABSTRACT: This article presents the two-year results of experimental work on the study of the effect of bentonite clay powder on the growth, development and area of cotton leaves. The article also reflects the fact that in subsequent years the use of microfertilizers in the fields of crops is reduced, and microelements are involved in important physiological processes in the plant body.

KEYWORDS: cotton, seed encapsulation, suspension, foliar application, bentonite, agro-ore, vegetation period, leaf area.

I.INTRODUCTION

Scientific justification of the ways of rational use of land and water resources, development of technologies for effective use of land and water resources, based on the different soil and climate conditions of the republic, maintaining and increasing soil fertility, and ensuring the population's demand for food products. and the situation requires making suggestions and recommendations for production.

In recent years, special attention has been paid to increasing the efficiency of agricultural land in our country, including using water-saving technologies.

The results of the research, such as the fact that bentonite from non-traditional mineral raw materials serves as a source of microelements and improves the water-physical properties of the soil, taking into account the sorption properties and determining the irrigation procedures and standards using them in the cultivation of agricultural crops, are presented in this practical project report.

Due to the shortage of potash and phosphorus fertilizers and the depletion of these nutrients in the soil in the agriculture of our republic in recent years, cheap local agro-ores are being used on a large scale. In this regard, the use of mineral raw materials is widely used not only in industrial production, but also in agriculture as local raw materials. A.A. Arbatov, A.S. Astakhov noted that mineral raw materials obtained from large mines and small finds are widely used on an industrial scale to grind betonite mud from non-traditional agro-ores to various degrees and add it to feed in livestock farming, increase the ration of poultry feed and as additional food in agricultural crops. [1].

II. SIGNIFICANCE OF THE SYSTEM

This article presents the two-year results of experimental work on the study of the effect of bentonite clay powder on the growth, development and area of cotton leaves. The study of methodology is explained in section III, section IV covers the experimental results of the study, and section V discusses the future study and conclusion.

III. METHODOLOGY

The mineral composition of bentonite clays includes montmorillorite up to 80%. The amount of secondary mineral hydromica is 10-25 percent. Quartz, cristobalite, iron hydroxides, calcite, palygorskite, galluasite, aunite, jarosite, etc. are found as additions [4].

Existing non-traditional mineral raw materials, due to their large reserves and low cost, are significant for their high efficiency in replacing some missing minerals in agriculture or using them as additional food [7].

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In the electron-microscopic pictures of preparations made from bentonite clay suspension, montmorillonite is composed of cloudy particles of irregular isometric shape with unclear edges. The size of such crystals ranges from 0,1 to 1,0 µm, with an average of 0,3-0,5 µm. Deformed crystals of montmorillonite are visible in the replica taken from the surface of the sample.

After special treatment of bentonite clays, a preparation with strong antiseptic and adsorbing properties was obtained from them. Clinical studies show that this drug is very effective in the treatment of surgical and burn wounds.

It is advisable to use the method of feeding agricultural crops from the leaves in the absence of moisture in the soil, low or high temperature, reduced absorption of nutrients in the soil and other adverse conditions. there are limitations in their full use, especially for micronutrients in non-chelated form.

Among nitrogen fertilizers, urea is the most convenient for foliar feeding, because urea burns less leaf surface than ammonium nitrate or KASS. When feeding from the leaf, the young organs of the plant are more actively involved in the absorption of nutrients [8].

The main goal of the application of any new agrotechnical measures in the maintenance of agricultural crops is to improve plant growth, accelerate development and increase productivity. In recent years, in the agricultural sector of our republic, as a result of consecutive planting of cotton and winter wheat crops in the same field, insufficient supply of mineral and organic fertilizers on time, the fertility of the soil is decreasing, and the amount of nutrients in it is decreasing year by year. This, in turn, causes a decrease in crop yields. Therefore, in the process of caring for cotton, it is important to improve the growth and development of the plant and to increase its yield by feeding it from leaves. It is known that for optimal growth and development of cotton, a sufficient amount of nutrients, i.e. nitrogen, phosphorus, potassium, calcium, boron, zinc, magnesium, manganese, iron, copper, sodium, molybdenum and other macro and micro elements are necessary. In the conditions of our republic, the cotton plant is mainly fed by its roots. In this case, it has been proven in many years of research that fertilizers should be used often before autumn plowing, before planting, together with planting and during the period of operation. However, when cotton is fed with nitrogen-phosphorus-potassium liquid suspended complex fertilizers through its leaves during the growing season, the plant is not only supplied with several nutrients at the same time, but also protected from various diseases and pests, and its resistance to adverse conditions and productivity increases.

For good growth, development, and high-quality yield of seedlings, it is necessary to sprinkle the suspension in addition to feeding them from the leaves. In this, the plant absorbs nutrients through its leaves and stems. The tolerance of cotton to other adverse factors increases, the yield increases, and the ripening of the crop is accelerated. If there is a need to apply a suspension when cotton produces 2-3 leaves, first, a mother solution is prepared based on the condition of the plant, taking into account the youngness of the seedlings during seed germination, i.e. absorption of nutrients through the leaves (small leaf surface). To prepare mother (matochnyy) for one hectare area, 5 kg of urea (46%N) is physically dissolved in water in a 50-liter container, and then the solution is poured into water in a 100-liter container, mixed well, and mother (matochnyy) solution is prepared. If the ratio (concentration) of the prepared solution is higher than recommended, it can burn young seedlings, on the contrary, if the ratio is low, the effect will not be noticeable. From ready-made liquid fertilizers, it is recommended to use KAS (urea-ammonium nitrate, 28-30% N) fertilizer at the rate of 5 l/ha or liquid nitrogen calcium fertilizer (SAKO', 25,4% N, 9.1% Ca) at the rate of 5 l/ha will be done. Also Fitovak (200-300 ml/ha), Gumimax 0,15-0,20 l/ha, Uzgumi 0,3-0,4 l/ha, Albit 40-50 ml/ha, Obereg 10 ml/ha, If Biodux 2,0 ml/ha and other similar stimulants are used, the positive effect on the growth and development of cotton will increase [5].

One of the main parameters determining the productivity of cotton is its dry matter accumulation. In a well-developed cotton, the weight of the harvesting organs increases and ensures a high yield.

The accumulation of dry mass of the plant is caused by various factors, especially in the physiological processes that take place in plants, potassium nutrition along with other elements is of great importance for the accumulation of sufficient mass, and the metabolism of nitrogenous and carbohydrate substances is improved, the increase of crop elements has a positive effect on the increase of the crop.

The leaf of the plant is the main organ that produces nutrients, connects the plant with the external environment, collects sunlight, absorbs carbonic anhydride gas and turns it into glucose, sucrose, evaporates excess moisture in the body of the plant, and moderates body pressure. The leaf plays the main role in the formation of chlorophyll grains and various pigments in the plant under the influence of sunlight.

In Nazarov's scientific works, it was proved that the reduction of nitrogen fertilizer feeding during the development phases of cotton causes a sharp decrease in photosynthesis productivity [6].

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In addition, the plant absorbs the nitrogen continuously falling from the atmosphere, which falls with rain, only through the leaf, artificially feeding the plant through the leaf, watering also gives good results.

Many external factors affect the leaf surface (level) of cotton, such as the treatment of cotton seeds, increasing soil fertility, the quality of seasonal treatments after cotton germination, the rate and duration of the given types of food [2].

IV. EXPERIMENTAL RESULTS

Research work on determining the effect of bentonite clay powder on the growth and yield of cotton was carried out in 2021-2022 in conditions of medium salinity soils of PSUEAITI Navoi experimental station. The researches were carried out on the S-01 variety of medium fiber cotton.

When observations were made in the experimental fields on June 1, July 1, and August 1 of 2021 and 2022, the length of the cotton in the control plots, i.e., in the variant planted with clean seed, was 18.9, 64.3, 100.5 cm, and 19.1 cm, respectively. 22.1, 71.6, 121.5 and 21.8, 72.8, 120.5 cm for slurry-fed variants and 19.7, 70.3, 111.9 and 20.7 for bentonite-only slurry-fed variants , was 71.5, 113.7 cm.

It is important to determine the changes in cotton leaf surface under the influence of bentonite clay powder used in seed coating and foliar feeding. In the first year of research, the number of leaves per plant in the period of cotton in the control option during the period of combing, flowering and ripening is 30.4 42.0; 33.8 units, and the leaf surface is 1141; It was 2052 and 1636 cm2. It should be noted that the number of leaves and surface area increased depending on the development periods of cotton. Usually, when the cotton bolls are 30-40% open, if the surface of the leaf is determined, it is observed that it is slightly reduced compared to the flowering period.

In all other variants, the surface of the leaf surface was relatively less during the ripening period of cotton, and in the variant where the seeds were covered with bentonite clay powder, the number of leaves per plant was 34.6, and the surface of the leaf surface was 1656 cm2. These indicators were found to be 0.8 units and 20 cm2 more than the control.

In option 3, which is used in shell planting with bentonite clay powder and foliar feeding with mineral fertilizers, the number of leaves and surface area are 32.9-1243 in proportion to the periods of cotton budding, flowering and ripening; 45.2-2139 and 36.4-1692 units/cm2, which are 2.5-102 compared to the control; 3.2-87 and 2.6-62 units/cm2 are higher.

During the growth period, it was observed that the surface of the leaf surface (at the time of ripening) of cotton of the 4th option fed only with suspension of urea and bentonite powder was 1671 cm2, and the number of leaves was 34.9.

In the second year of the experiments, the same rule was maintained, and it was found that the highest values were obtained in option 3, which used bentonite clay powder for shelling and foliar feeding with mineral fertilizers.

V. CONCLUSION AND FUTURE WORK

Therefore, the combination of bentonite clay powder for seed coating and foliar feeding has been proven to have the optimal effect on the leaf surface in 2-year research.

Additionally, application of bentonite clay powder as encrusting and foliar feeding resulted in reduced mortality of existing seedlings. The use of bentonite clay powder in foliar feeding during the growing season helps the plant in stressful situations in various adverse environmental conditions. The fact that bentonite clay retains water for a long time, forms a thin film when sprinkled on the surface of the leaf, protects the water from excessive evaporation from the surface of the leaf, and also prevents the evaporation of the mineral fertilizer sprinkled with it and causes it to be fully absorbed, had a positive effect on the development of the plant.

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