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COST-EFFECTIVENESS OF FERTILIZER RATE SETTING IN THE CULTIVATION OF THE PLANNED FINE-FIBER COTTON CROP

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Abstract:

The article describes the agrotechnology of high-quality cotton growing from fine-fiber cotton, the correct definition of fertilizer norms and timing of application to the soil, the role of fertilizers in increasing soil fertility, methods of determining the cost-effectiveness of targeted use of fertilizers. The article substantiates the cultivation of fine-staple cotton and the receipt of raw cotton for the planned harvest. The role and importance of mineral fertilizers in increasing soil fertility and cotton yield, as well as the economic efficiency of using fertilizers for fine-fiber cotton.

Keywords: high-qualitycotton growing, soil fertility, mineral fertilizers, cotton yield, cultivation, raw cotton, cost-effectiveness,

INTRODUCTION

Relevance and necessity of the topic

In the Action Strategy of the President of the Republic of Uzbekistan Sh.M.Mirziyoev on the five priority areas of development of the Republic of Uzbekistan for 2017-2021 The main focus is on development.

[1] The main task of agro-industrial workers is to increase and increase the productivity of agricultural crops by 1.5-2.0 times in order to fully supply the food industry with raw materials through the implementation of this task.

The world annually produces 19.5-20.1 million tons of cotton fiber, of which 1.2 million tons are fine-fiber cotton varieties I, II, III.

In recent years, there has been a growing demand by the textile industry for the production of long, fine, fine-fiber cotton raw materials specializing in the production of high-quality yarn.

In 1987, the sown areas of fine-fiber cotton varieties in the country amounted to 204,000 hectares and 587,000 tons of fine-fiber cotton were grown. [5] The reason for the cultivation of fine-fiber cotton in Uzbekistan is the climatic conditions of the southern oases, the average effective air temperature is close to the air temperature of the Egyptian oases, ie the average air temperature in Cairo is 3281 ° C, Alexandria 3030 ° C, Sherabad 3357 ° C, Termez 2924 ° C. is formed. This figure is a favorable climatic conditions for the cultivation of fine-fiber cotton varieties.

It is known from observations that in recent years in the southern regions of Surkhandarya region due to the sharp rise in temperature during the growing season of cotton, the frequent occurrence of garmsel causes the loss of yield elements and flowers of medium-fiber cotton varieties grown in the southern regions.

It should be noted that when the well-known selection scientists MS Istomin and EG Govrilov studied the resistance of medium and fine-fiber cotton varieties to the hot heat in the oasis in Surkhandarya region, the loss of yield elements in medium-fiber cotton varieties was 75%. found to be 35% in fine-fiber cotton varieties. It is known from the results of the observations that the fine-fiber cotton varieties have been proved to be more suitable for the extreme climatic conditions of the oasis than the medium-fiber varieties. [6] In this regard, during his visit to Surkhandarya region on October 18-19, 2019, President Mirziyoyev instructed to plant fine-fiber cotton varieties on 40,000 hectares in the southern regions of the region from 2020, taking into account the natural and climatic conditions of the region. This is because the planting of fine-fiber cotton varieties in the oasis will increase the economic power of the Republic.

The level of learning of the problem

According to the results of experiments conducted at the Surkhandarya branch of PITI since 1960, only due to the natural fertility of the soil for 50 years, the average yield of fine-fiber cotton was 16.4 quintals per hectare. Annually, the soil is fertilized with 200 kg of nitrogen, 100-140 kg of phosphorus and 100-125 kg of potassium fertilizers per hectare, 32-33 ts / ha, mineral fertilizers and 10-20 tons of manure per hectare, 35-37 ts / ha and alfalfa-grain - 38 - 42 ts / ha of fine-fiber cotton - raw material was obtained from the field where cotton rotation was introduced. [6]

According to PN Besedin, TT Bulorova (1970), BM Khalikov (2010), a decrease in the amount of humus and nitrogen in the soil was observed during the chronic planting of cotton on ordinary gray soils. Soil fertility is significantly reduced, especially in non-fertilized variants.

According to BM Khalikov (2004), the amount of humus in regular cotton for 3 years decreased by 0.15%, for 5 years by 0.24% and for 10 years by 0.37%, the amount of nitrogen in the soil decreased by 0.013%, 0.030%, 0.039%, respectively. In the experiment, it was found that when alfalfa and cotton were planted alternately for 3 years, the humus content in the soil increased by 0.23%, nitrogen content by 0.047%, and cotton yield by 5-6 ts / ha. [7]

GOALS AND OBJECTIVES OF THE STUDY

Development and implementation of proposals and recommendations to increase the economic efficiency of agrochemical services to agriculture, the cultivation of high-quality raw cotton from fine-fiber cotton, the use of mineral fertilizers in scientifically sound standards and terms.

According to the results of experiments conducted by scientists of the Surkhandarya branch of UzPITI, it has been proved that the planned harvest without mineral fertilizers is impossible in the production of high-quality and high-quality cotton fiber. Currently, 50-60% of the total cotton crop is grown at the expense of mineral fertilizers.

The use of mineral fertilizers in the provision of agrochemical services to agriculture should take into account the economic efficiency of mineral fertilizers. Usually, the economic yield is determined by the additional yield per hectare (ts / ha), the coverage of the unit of fertilizer applied to the soil with grain, fiber or gross yield, and the amount of net income received (sum). According to the results of many field experiments in the country and abroad, when mineral fertilizers are applied to the soil in moderation, it is possible to get 2.7 - 5.7 kg of grain, 2.3 - 5.6 kg of raw cotton in addition to one kg of active substance.

It has been determined that the cost of one soum associated with the application of fertilizers in the soil-climatic conditions of different regions will bring a net income of 1.5 - 8.0 soums. The structure of arable lands of existing farms and cluster farms, as well as crop rotation technology are of great importance. It is necessary to follow the following in determining the norms of mineral fertilizers, taking into account the type of crop with the highest yield and the level of soil fertility, score banette, crop placement and yield and yield from the land.

- Planned and additional yield ts / ha per hectare of land;
- Yield per hectare in soums;
- Labor cost per hectare and unit of output, person, hour;
- Cash costs per hectare and 1 ts of product;
- Income per hectare, profit per soum spent, UZS;
- Profitability rate as a percentage.

PRACTICAL RESULTS OF THE RESEARCH

Based on the recommendations of research institutions, the following norms of mineral fertilizers are recommended for each hectare of land planted with fine-fiber cotton, taking into account the different soil-climatic conditions of the Republic:

Pure nitrogen - 150, phosphorus - 105, potassium - 75 kg per hectare for growing 20-25 tons of cotton; Nitrogen for 25-30 t of cotton - 200, phosphorus - 140, potassium - 100 kg; Nitrogen for the yield of 30 - 35 ts - 250, phosphorus - 175, potassium - 125 kg; For the cultivation of 35 -40 ts and higher yields can be obtained by applying the norm of nitrogen - 300, phosphorus - 210, potassium - 150 kg.

The following agro-technical measures should be taken to grow high-quality raw cotton from fine-fiber cotton: first, 40 tons of manure per hectare, 60-70% of the annual norm of phosphorus fertilizers based on soil agrochemical cartograms 50 per cent of potassium should be given before plowing the land.

It is not advisable to spray 5 to 10 tons of manure on all areas, as a small amount of organic fertilizer will not be spread evenly on the surface of the soil, resulting in uneven soil fertility. According to the results of the inspections, it was observed that the soil fertility varies in the same field. It should be noted that the most important task of agricultural workers and farm managers is to create the optimal conditions for cotton at each stage of growth and development of cotton to grow high and quality crops from cotton. The nutrient requirements of cotton vary during different periods of the growing season. Critical (limited but essential) and intensive cycles of plant nutrition are different. During the germination period of cotton seedlings, cotton requires a small amount of nutrients.

However, the presence of more or less nutrients in the soil has a strong effect on young plants. Especially during this period, the lack of phosphorus in the soil has a negative impact on the development of cotton throughout the growing season. Subsequent experiments have shown that even by applying large amounts of phosphorus fertilizer to the soil, the planned yield cannot be obtained. Therefore, the presence of phosphorus in the soil in the early stages of development of cotton seedlings has a positive effect on the good development of the root system of cotton, the formation of yield elements on the growth of stems and leaves.

The most important task is to increase the efficiency of mineral and organic fertilizers in the complex of agro-technical measures, which will increase the yield of cotton in the development of cotton growing in the country, to increase the economic efficiency of fertilizers and further improve agrochemical services to agriculture.

In this regard, the recommendations developed by UzPITI and its experimental stations recommended the production of an optimal system of cotton fertilization. According to the recommendations, 45-6 kg of ammonium nitrate or 35-40 kg of urea, 160-200 kg of ordinary superphosphate or 40-50 kg of ammophos per hectare should be physically planted at the same time as sowing. When 90 - 100 kg of superphos seeds are fed at a depth of 12 - 14 cm, at a distance of 5 -7 cm from the planting line, conditions are created for healthy and even development of seedlings. However, due

to the fact that most farms in Surkhandarya do not support such an important measure, the annual cotton production plan is not being implemented.

At the first feeding of cotton, when producing 3-4 leaves, 50 kg of pure nitrogen fertilizer per hectare is physically applied, 150 kg of ammonium nitrate, 108.5 kg of urea, 238 kg of ammonium sulfate. At the first feeding, fertilizers are applied at a distance of 15-18 cm from the plant rows and at a depth of 12 - 14 cm. If the fertilizer is applied deeper, the cotton roots will not be able to absorb the fertilizer well because they are underdeveloped or may be wasted under the influence of falling into the lower layers of the soil. Feeding nitrogen fertilizers with urea or ammonium sulfate fertilizers in areas with a phosphorus element content of 16-30 mg / kg in soils with high phosphorus content, ie 46 mg / kg and above, increases the economic efficiency of fertilizers using ammonium nitrate fertilizer.

Cotton-bearing areas need to be fed with 75 kg of pure nitrogen and 50 kg of potassium fertilizers. This norm is 221 kg of ammonium nitrate or 163 kg of urea and 111 kg of potassium chloride salt per hectare.

In the mowing phase, fertilizers are applied at a distance of 20–22 cm from the plant row, to a depth of 14–16 cm. In areas where cotton is beginning to bloom, it is necessary to feed with nitrogen and phosphorus fertilizers. At the same time, 75 kg of pure nitrogen per hectare, 221 kg of ammonium nitrate or 163 kg of urea and 50 kg of phosphorus per hectare are fed with 108.5 kg of ammophos and 350 kg of ordinary superphosphate fertilizers. In the flowering phase of cotton, fertilizers are applied to the soil at a depth of 14-16 cm from the row, if the planting scheme is 90 cm, at a distance of 30 - 35 cm from the row, if the planting scheme is 60 cm.

The use of rotten and sifted manure or compost during the growth of cotton with mineral fertilizers at the rate of 1 kg of nitrogen fertilizer with the addition of 2 - 2.5 kg of manure or compost gives good results. Especially at the beginning of the flowering and flowering period of cotton, the application of 600-700 kg of dry local fertilizers or composts per hectare in combination with mineral fertilizers increases the cotton yield by 2-3 quintals per hectare. Because organic fertilizers contain all the nutrients.

Due to the fact that the semi-rot contains 0.4% nitrogen, 0.25% phosphorus and 0.5% potassium elements and many trace elements, the application of organic fertilizers improves soil structure and aggregate condition, water-air, heat regime, increases buffering properties, soil temperature rises in early spring.

It should be noted that instead of the manure currently used on farms, it is possible to grow additional crops at the expense of the nutritional value that the plant can absorb when using enriched compost.

Chemical composition of manure:	Chemical composition of compost:
Nitrogen - 0.4%	Nitrogen - 0.7%
Phosphorus - 0.25%	Phosphorus - 0.45%
Potassium - 0.5%	Potassium - 0.8%

According to this chemical composition in 100 thousand tons of manure -
Pure nitrogen - 400 tons
Pure phosphorus - 250 tons
Pure potassium - 500 tons
The total NPK is 1150 tons.

According to the norm, if 3.1 kg of cotton is grown at the expense of 1 kg of NPK, 3565 tons of raw cotton can be grown for 1150 tons of feed. If the purchase price of 1 ton of cotton is 34,800 soums, the total will be 3,240,000 soums.

If 100,000 tons of enriched compost is used on farms:
Pure nitrogen - 700 tons
Pure phosphorus - 450 tons
Pure potassium - 800 tons
The total NPK is 1,950 tons.

Due to this amount of NPK it is possible to grow 6045 tons or 2480 tons more cotton than manure. This will provide additional income of 86,200,000 soums. Most importantly, it plays an important role in improving soil composition, increasing the absorption of mineral fertilizers by plants, preserving the environment, achieving economic efficiency in the cultivation of high-quality fine-fiber cotton tomorrow. According to the recommendation of Uzagrokimyotaminot, a 30-meter-long, 3-meter-wide and 2-meter-deep pit will be dug near or near the livestock farm for composting. The floor is covered with a layer of fresh manure or manure silt 20 cm thick. A ditch, ditch, canal mud, plant leaves, etc. are thrown on it. Each ton of mixture is sprayed with 15 kg of superphosphate and 20 - 25 kg of potassium fertilizer in equal proportions.

The thickness of each layer should be 15 - 20 cm. The second, third and subsequent floors are filled in the same order. When the height of the compost above the ground reaches 1.5 meters, it is moistened with the required amount of water, and the surface is covered with soil to a thickness of 15 - 20 cm and covered with mulch. Compost is fully ready in 3–4 months.

The deadline for feeding cotton during the growing season should be completed by July 10th. It was found that delaying this period will prolong the period of growth and development of cotton, reduce yields by 2 -3 ts / ha and adversely affect the quality of fiber, reduce the economic efficiency due to mineral fertilizers. When feeding only nitrogen fertilizers without the use of phosphorus and potassium fertilizers in the feeding of cotton, the opening of the pods is delayed by 15 - 20 days, the yield quality decreases, the ratio of fertilizers in the soil NPK (1:0.7:0.5) as a result of the

violation of the ratio, the disease resistance of plants decreases due to the growth and germination of cotton. Especially in fields without potassium, due to excessive shedding of stalks, disruption of flowering and weeding, reduced drought tolerance of plants, loss of cotton raw material and seed weight, oil content in seeds, deterioration of fiber quality, poor quality of raw cotton. delivery and low valuation of cotton fiber has been proven by UzPITI scientists.

However, the reason why most farms in the country do not use KS1 (potassium chloride) fertilizer is that they do not apply potassium fertilizers to the soil due to the misconception that potassium chloride fertilizer leads to soil salinization.

It should be noted that the average thickness of soils in all regions of the country is 0-30 cm, with an average of 3,600,000 tons of soil. When the annual rate of potassium fertilizer per hectare is set at 125-150 kg in pure form, 277.5-333.0 kg of potassium fertilizer falls into the soil from KS1 fertilizer, which physically contains 45% of the potassium element. This amount of potassium fertilizer cannot saline 3,600,000 tons of soil per hectare.

Therefore, the use of potassium fertilizers improves the metabolism in the plant organism, increases the resistance of plants to gonorrhea and wilt diseases. In this regard, proper nutrition of plants can be achieved economically by following the agrochemical maps prepared by the agrochemical service societies and current recommendations, mainly in combination with fertilization and supplementary feeding, to obtain the planned yield from crops.

CONCLUSIONS AND SUGGESTIONS

1. Correct selection of cotton varieties, correct timing and norms of sowing of seeds for high-quality and high-quality production of fine-fiber cotton in the southern regions of the country.
2. Control over the correct determination of the annual rate of fertilizer for the planned harvest of fine-fiber cotton.
3. Achieve sustainable development of cotton, the role of applied fertilizers in increasing soil fertility and increase the economic efficiency of fertilizers.
4. The use of intensive methods for the production of high quality cotton, the introduction of modern resource-saving agro-technologies, further expansion of the infrastructure of agrochemical services to agriculture.
5. In extreme climatic conditions, where the southern regions of the country are covered with barren, barren-meadow soils, it is possible to get the planned yield by applying nitrogen - 300, phosphorus - 210 and potassium - 150 kg per hectare of fine-fiber cotton 35-40 quintals or more per hectare.
6. Improving agrochemical services to agriculture, achieving economic efficiency by increasing yields due to fertilizers.
7. It is necessary to provide the types of fertilizers used for feeding in the growing phases of cotton and to set their norms correctly.

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