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SOCIETY FOR SCIENCE AND EDUCATION

Effect of Ecophosphoazotine on the Productivity of Cotton Plant Photosynthesis in Dry and Salt Soils

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ABSTRACT

Data are given on the impact of the productivity of cotton photosynthesis when organic fertilizer Ecophosphoazotine is used on arid, saline soils in the Bukhara region. Ecophosphoazotin - organic-fertilizers, environmentally friendly, universal action. The introduction of ecofofazotin in order to acidify soils with different salinity, the pH of the environment improves. It is rich in phosphorus, nitrogen, biologically extractive substances, macro-microelements important for plant nutrition and development. With the use of Ecophosphoazotine (12 kg/ha), the intensity of the growth of photosynthetic potential in the growing season of cotton increases due to the increase in the leaf surface. Mineral fertilizers + Ecophosphoazotin had a direct impact on the nature of the formation of the leaf surface of cotton. The maximum values of the leaf surface were observed in the phase of flowering-fruit formation, the greatest development of the leaf surface of cotton. It was found that the nature of the formation of the leaf surface, dry weight and productivity of photosynthesis of cotton Ecophosphatin-12 kg/ha had a beneficial effect. Introduction with sowing Ecophosphoazatin increases NPP due to the stimulating effect of microorganisms that are part of Ecophosphoazatin, it begins to appear from the flowering phase. When cotton seeds are applied to crops with Ecophosphoazotins, there is a tendency to increase NPP and yield additions by 3.0-4.4 c/ha.

Keywords: Ecophosphoazotin, Leaf surface, Dry weight, Photosynthesis productivity, Salinity reduction, Yield, Profitability

INTRODUCTION

It is known that one of the most important problems is the cultivation of high-quality, early-ripening products from agricultural crops and increasing resistance to various adverse environmental conditions. In this direction, organ mineral, humic-like, micro strains, environmentally friendly fertilizers and immunostimulants play a special role in overcoming such problems. Environmentally friendly fertilizer and immunostimulants improve; regulate growth and development, photosynthesis productivity, increase yield and quality, and adaptability of plant resistance to stress, increasing immunity to various diseases in nature [1-3]; [4-5].

Ecophosphoazotin - is one of such natural organic-fertilizers, environmentally friendly bone meal, has a comprehensive effect on plants compared to other fertilizers. It gives plants resistance to fungal and bacterial diseases, drought, salinity, improves immunity and regulates the activity of endogenous phyto hormones in plants, ensuring growth and development, leaf canopy, dry weight and photosynthesis productivity [1-3]; [4-5].

To solve this problem, of course, on a scientific basis, to study the causes of increased salinization, reduced soil fertility, deflation and erosion, violation of melioration, soil compaction, chemical contamination, improper use of crop rotation, constant disruption of crop nutrition, climate, link and study the negative aspects of such changes, find ways to eliminate them, develop new, resource-saving, environmentally friendly, low-cost, safe, organic fertilizers such as ecophosphoazotine, apply them in practice and develop innovative agricultural technologies for nutrition on scientific basis remains one of the most important problems of our time.

In order to overcome this problem in the Bukhara experimental fields of the *Scientific Research Institute of Breeding, Seed Production and Agricultural Technology of Cotton Growing* used ecophosphoazotin in cotton, (in 2019-2020) studied its effect on soil salinity and fertility, structure and growth, development and productivity of photosynthesis, yield and quality of cotton fiber.

Therefore, at this time, the use of natural, environmentally friendly organic fertilizers rich in macro- and microelements with such a universal action is Ecophosphoazotin is very necessary.

Ecophosphoazotin is a bone meal obtained by processing the bones of domestic animals, which is used instead of phosphate fertilizers and contains up to 29-34% P_2O_5. [4]. The most important problem today is the development and production of fertilizers that are well absorbed by the plant when caring for crops without harming the environment, soil fertility, structure and number of living microorganisms in the soil. In this regard, in order to study on a scientific basis, what doses of ecophosphoazotin are applied to cotton varieties Bukhara-10, saline soils, it is necessary to substantiate how it affects the salinity and fertility of the soil and growth and development, the productivity of cotton photosynthesis, the yield and quality of the fiber, and check it through field experience, various analyzes and observations.

LITERATURE

About 95% of the dry biomass of a plant organism is accounted for by organic substances formed in the process of photosynthesis. Therefore, the change in the dry mass of plants can quite objectively reflect the assimilation activity of plants. One of the indicators characterizing the production process of plants is the net productivity of photosynthesis (NPP). This indicator is often used in scientific research to determine the photosynthetic productivity of plants [6-9]. The net productivity of photosynthesis is the mass of dry matter in grams accumulated by 1 m^2 of leaf area in 1 day. The value of this indicator for different plant species ranges from 1 to 50 g/m^2⋅day. [10-13]; [14-18]

Phosphorus increases the ability of plant cells to retain water, which enhances resistance in dry and frosty periods. The use of phosphate fertilizers improves the dry weight, canopy and photosynthesis productivity, fruiting, soil structure, increases the content of sugars and protein in the fruits of crops [19- 21]; [22-24]; [25-28]; [29-31]; [32-34]; [35-37].

D. Ivantsov in his brochure "EM Biotechnology of Natural Agriculture": "As a result of plant nutrition, C- contains 50% of its content, O - 20%, N (comes with water) - 8%, and these gases are absorbed from the atmosphere. Although only 15% of N and 7% of minerals are extracted from the soil, N is also fixed in the atmosphere mainly by bacteria, and one cannot function without the other [5].

Merker said that the «plant absorbs 40 kg of nitrogen, 60-90 kg of potassium and 30 kg/ha of phosphorus in the soil during the growing season» [3]; [5-6].

Scientists [1-3]; [5-6] found that to obtain 1 ton of raw cotton, the plant absorbs N-45, P-20 and K-45 kg/ha.

Based on the above considerations, the question arises: "if the amount of nutrients needed by a plant to produce 1 ton of cotton is naturally sufficient in the soil and atmosphere, then why the excessive use of mineral fertilizers, labor, machinery and fuel and lubricants?" This can be explained as follows: in the 80-90s of the last century, in order to fulfill the cotton state plan (5.5-6 million tons), they did not comply with the crop rotation system, sowed monocrops (cotton) in continuous fields, used increased doses of mineral fertilizers [6,19,25]; [35-37].

As a result, soil fertility decreased, caused serious damage to soil fertility and structure, soil transpiration coefficient and salinity increased, non-compliance with the irrigation system negatively affected land reclamation, disrupted biochemical processes in the soil and led to the disappearance of beneficial living microorganisms (bacteria, mycorrhiza, and hyphae, earthworms, ants, beetles, etc.) and their place was replaced by phytotoxic microorganisms, which quickly multiply and cause plant wilting and drying, which until now had a negative effect on plant growth and productivity to a certain extent [6, 19,25]; [35-37,38].

As a result, the susceptibility of agricultural crops to various insects, pests and diseases has increased, which led to a decrease in plant immunity, yield and quality [6, 37, 38].

Repeated, excessive application of mineral fertilizers in crops, as well as improper soil cultivation, land irrigation, led to soil compaction, increased salinity and degradation, which led to a decrease in the absorption of nitrogen and phosphorus fertilizers by plants [6, 37 and 38].

The literature also reports a violation of the law of balance of nature, which not only harms the environment, but also has a negative impact on heredity, modification, changes in plant properties (cotton) [6, 37 and 38].

In connection with the above literature data, we can conclude that, in arid, saline and very hot climatic conditions, in order to obtain a high and high-quality crop yield, it is necessary to use such as: Ecophosphoazotin - a natural, environmentally friendly organic fertilizer, universally effective, rich in macro- and microelements, which increases dry weight and productivity.

RESEARCH METHODOLOGY

The studies were carried out according to the methodology adopted at *Scientific Research Institute of Breeding, Seed Production and Agricultural Technology of Cotton Growing* to determine the total humus content, soil samples were taken in layers of 0-30, 30-50 cm of soil, before application and at the end of the growing season according to the method of I.V. Tyurin. Nitrogen and phosphorus were determined by the method of I. M. Maltsev and L. N. Gritsenko. Nitrate forms of nitrogen - according to the ion metric device. Mobile phosphorus - according to B.P. Machigin, and exchangeable potassium according to a flame photometer. The amount of gross and mobile forms of humus and nutrients (NPK) in the soil of the experimental field was averaged by sampling for each option from 0-30, 30-50 cm soil layer "Methodology of field and vegetation and agrochemical experiments with cotton" (1973) [39], "Methodology of field research" (Tashkent, 2007) [40]. The productivity of photosynthesis was determined by the method of Nichiporovich (1961) [41]. These yield results were dispersion analyzed according to the method of B. Dospekhov "Methodology of field experience" (Moscow, 1989) [42]. Table 1 shows the distribution of experimental variants over repetitions.

Table 1: Distribution of experimental variants by repetitions on the field

number of options	repetition of experience		
	I repetition	II repetition	III repetition
1	1 option	3 option	2 option
2	2 option	1 option	3 option
3	3 option	2 option	1 option

The distance between the rows is 90 cm. The area of each plot is 270 m^2. The depth of groundwater is -2 m. The mechanical composition of the soil is of medium weight. The control variant was the annual application of mineral fertilizers in doses of N-250 kg/ha; P-175 kg/ha; K-120 kg per hectare. A total of 3 options were studied. The experiment was repeated three times. The distribution of experimental variants by repetitions in the field was carried out according to the randomization method.

The purpose and task are to study the effect of optimal doses and timing of the use of Ecophosphoazotin medium fiber cotton variety "Bukhara-10". To identify the influence of soil fertility, pH of the environment, salinity and volumetric weight of soils, as well as seed germination, plant growth and development, abscission of fruit elements, photosynthesis productivity, yield and quality of fiber and seeds, in the saline soil of the Bukhara oasis.

Object and Subject of Research

Cotton varieties "Bukhara-10" were used as an object of research, as well as the introduction of environmentally friendly fertilizer Ecophosphoazotin at a density of plants (80-90 thousand bushes/ha) of cotton.

Ecophosphoazotin was used once in the experiment, with sowing, soils were cultivated at 6-12 kg/ha in pure form. In studies, the application of Ecophosphoazotin on the plant was carried out manually at a consumption rate on the physical form of 186-372 kg/ha.

To determine the net productivity of photosynthesis in the field, samples of plants were taken from each variant of the experiment during (beginning and until the end of the growing season), i.e. From the 1st to the 5th day of each month, the time interval (of a certain developmental phase) was determined by dry biomass and the area of the leaf canopy.

The area of the leaf surface was determined by the method of "cutting" on 10 plants from the site on two non-adjacent repetitions according to the phases of plant development according to the formula

$$S = \frac{\mathrm{PS1n}}{\mathrm{P1}},$$

Where - S is the total leaf area of one plant, cm_2; S_1 - is the area of one cut, cm_2; P- is the total mass of leaves of one plant, g; P_1- is the mass of cuts, g; n- is the number of notches. Having determined the plant density per 1 ha, the leaf area per 1 ha was calculated;

The mass of dry matter was determined by taking an average sample of crushed plants. From each variant, samples were taken in 50 g portions in duplicate, fixed, and dried in an oven at 105°C to constant weight. The mass of dry matter was determined by the formula

Where, A – dry weight (sample samples after drying), g; B - wet weight (samples before drying) g;

Net productivity of photosynthesis was calculated by the formula of Kidd, West and Briggs:

$$NPP = (B_2 – B_1) / ((L_1 + L_2) \times 0.5 \times n),$$

Where NPP- is Net productivity of photosynthesis;

Where B_1 and B_2 are dry plant biomass at the beginning and end of the accounting period, g;

- $B_2 – B_1$ – dry weight gain for n- days, g;
- L_1 and L_2 – are leaf areas at the beginning and end of the period, m^2;
- $(L_1 + L_2)$ – average leaf area during the experiment, m^2;

- n - Is the number of days in the accounting period.

In the experimental variants, we selected in 3 replications (at the beginning of the growing season, 50 plants, at the end of the growing season, 3 plants), the most typical for this phase of development. The sample included all fallen and dried leaves, shoots, roots and fruit elements. In the latter case, the roots were carefully freed from the soil by washing them with water. The selected organs of the plant were placed in plastic bags and transferred to the laboratory, and the raw mass was immediately weighed.

In the laboratory, the indicators necessary for calculating the NPP were determined:

1. From each variant of the selected test plants at the beginning and end of the growing season, the wet and dry weight of various plant parts was determined. For this, plants from each repetition were dissected into separate organs (leaves, stems, roots, fruit elements and raw cotton) and weighed. Yellowed and dead leaves were counted separately. The results were recorded in a record book.

Harvesting was carried out manually according to the method of weighing from the entire area of the plot. The quality of the fiber was determined in the laboratory of the regional "Sifat", the oil content of the seeds was determined by the method of extraction with petroleum ether on a Soxhlet apparatus. The scheme of experiments is shown in table 2.

Table 2: Experience Scheme

	Experience options	Applied doses, kg/ha	Terms of application
Medium-fiber cotton variety Bukhara-10 at plant density (80-90 thousand bushes/ha)			
1	Control (traditional method)	N – 250 – P – 175 – K - 100 kg/ha	-
2	Ecophosphoazotin	N – 250 – P – 175 – K – 100 kg/ha + Ecophosphoazotin 186 kg/ha physical, 6.0 kg/ha pure	With sowing
3	Ecophosphoazotin	N – 250 – P – 175 – K - 100 kg/ha + Ecophosphoazotin 372 kg/ha physical, 12.0 kg/ha pure	With sowing

In order to study and determine the effectiveness of Ecophosphoazotin, which plant consumption rates are the best option, 2 different doses of consumption (6-12 kg/ha in pure form) were applied with sowing.

RESULTS AND DISCUSSION

Summarizing the autumn data on the number of mobile forms of NPK, we see that to at the end of the growing season of cotton plants organic fertilizer ecophosphoazotine was used according to the experimental options in different quantities.

One of the main reasons for this is the presence in the new organic-fertilizer of phosphorus, nitrogen, potassium, zinc, iron, calcium, and 3 amino acids, which improves the distribution of nutrients in plants, as well as in saline soils (neutralizes the pH of the soil environment) and as a result of the gradual intake of phosphorus throughout the growing season of plants) an increase in crop elements due to better absorption of phosphorus by the plant than mineral fertilizers, their distribution depending on the leaf surface, the accumulation of dry matter and the accumulation of crop elements in one plants. Although the mobile forms of nutrients and the amount of humus are absorbed by the plant to varying degrees according to the options.

Table.3: Agrochemical characteristics of the soil (before and after the introduction of ecophosphoazotin)

soil laers, cm	Amount of total humus, in %		General forms,%		Mobile forms, mg/kg					
			N	Putumn	N-NO_3autumn		P_2O_5Autumn		K_2O Autumn	
Bukhara-10										
0-30	1.080	0.963	0.080	0.150	11.0	3.8	20.0	11.5	183	170
30-50	1.010	0.890	0.076	0.143	10.8	3.5	19.3	11.3	180	165
0-30	1.083	0.965	0.083	0.154	11.1	3.9	20.4	12.5	184	171
30-50	1.012	0.892	0.079	0.147	10.9	3.6	19.8	11.6	182	167
0-30	1.099	0.979	0.088	0.168	11.3	3.9	21.7	15.3	186	173
30-50	1.023	0.900	0.085	0.159	11.5	4.2	20.5	12.0	185	169

Analyzing the data in Table 3, the sums of common and mobile forms of nutrients in this field in spring by soil layers (0-30; 30-50 cm), respectively: humus - 1.099-1.080%; 1.023-1.010%; nitrogen-11.3-11.0 mg/kg; 11.5-10.8 mg/kg; phosphorus-21.7-20.0 mg/kg; 20.5-19.3 mg/kg; potassium - 186-183 mg / kg; 185-180 mg/kg. By autumn, these figures were as follows: humus -0.979-0.963%; 0.900-0.890% of the amount of mobile forms: nitrogen - 3.9-3.8 mg/kg; phosphorus - 15.3-11.5 mg/kg; potassium-173-170 mg/kg. These figures indicate that the soil of the experimental field is provided with nutrients below average.

From the data in table.3 shows that in all variants their number decreases in layers from spring to autumn, depending on the yield.

Before sowing and at the end of the growing season, soil samples were taken from the arable. The subsoil layer every 10-40 cm, using the cylindrical method, and the volumetric weight of the mass was determined.

From the agrophysical properties of the soil in the spring and autumn period, the bulk mass before the introduction of Ecophosphoazotin into the arable layer of soil (0-30cm) and subsurface (30-50cm), respectively, were: in spring -1.410-1.420 g/cm^3; in autumn, respectively: 1.425-1.510 g/cm^3 (control), and in the variant with the use of Ecophosphoazotin 6-12 kg/ha, respectively, the following indicators: 1.400-1.412 g/cm^3 (2-var); 1.390-1.400g/cm^3 (3 var. in spring); 1.415-1.449 g/cm^3; 1.405-1.445 g/cm^3 (in autumn). Thus, studies have shown that the bulk density of soil in the 0-30-50-cm soil layer decreases to 0.010-0.061 g/cm^3 by autumn; 0.020-0.065g/cm^3 compared to the options used in ecophosphoazotin options.

In order to influence the germination of seeds of organic fertilizer ecophosphoazotine in the cotton variety "Bukhara-10" was determined in the field.

Seed germination began to germinate on the sixth day from the date of sowing (under the conditions of this year) and the field germination of seeds in the control and test options was 78-84.2-84.7%, respectively, and the percentage of germination was 0-6.2-6.7% higher than in the control options.

It should be noted that on the new cotton variety "Bukhara-10" on which ecophosphoazotin root rot was applied, gommoz was practically absent. Although during the sowing period there were a number of difficulties due to precipitation, but the harvest of the cotton variety “Bukhara-10” was completely harvested without loss.

The presence of 3 different amino acids, zinc and potassium in ecophosphoazotine ensured that cotton seeds would germinate faster and healthier than the control. In other words, these trace elements and amino acids increase resistance to various stressful situations, which allows uniform germination of cotton seeds in rainy, salty and cold weather.

The most important factors in increasing the productivity of plant photosynthesis are such agro technical measures as light, thermal, water-air and mineral, the norms for the timing of the introduction of local and organic fertilizers, the density of plant standing and chasing, and other agricultural activities.

All physiological and genetic processes that occur in the trace elements of a plant organism are directly related to how its tissues and cells are supplied with water and nutrients.

If this process is carried out normally, the yield and its quality will be high. The intensity of plant respiration, the productivity of photosynthesis, the metabolism in it, the evaporation of water, and other similar processes are in many ways directly related to how the plant is supplied with water and nutrients, to the number of seedlings and the timing of germination.

The formation of the photosynthetic apparatus is a complex process. In the early phases of growth and development of cotton, the processes of new formation and growth of leaves predominate, and in the later phases, the processes of death associated with increased transport of plastic substances to the reproductive organs [7-9]; [10-12]; [13-15]; [18,23,24]. The accumulation and storage of energy in the process of photosynthesis is accompanied by the accumulation of biomass, which serves as a structural and energy material that ensures the existence of plants [17].

The maximum yields of cotton can be formed by crops with optimal leaf area and dry weight, and it is important that it quickly increases to a maximum value and stays at the achieved level for a long time without a sharp decrease by the end of the growing season, absorbing solar radiation to the maximum [16]. In crops that are potentially capable of forming a very large leaf surface, which include dry mass, in particular, cotton, cereals, and other agricultural crops [17], the degree of its actual development, and thus the factors of photosynthetic activity that limit yield, depend decisively on growing conditions.

If the resources of moisture and nutrition are insufficient, then the main factor limiting the yield of plants is the insufficient development of the leaf surface, dry mass, and on poor, arid, saline soils, the low productivity of its work.

The main indicators of the photosynthetic activity of plants are: leaf area, dry weight, net productivity of photosynthesis and utilization factor of photosynthetic active radiation. The leaf area value is composed of the leaf area of individual plants and depends to varying degrees on the growing season, growing weather conditions, variety, plant density, nutrient availability, etc.

Studies [14, 18] indicate that a plant that has less intense photosynthesis can be more productive, but uses a larger percentage of assimilates for the formation of leaves and forms a large assimilation surface. Therefore, it is very important to use agro technical measures to achieve the optimal leaf area and dry weight of plants in the shortest possible time.

Many literatures indicate that with an increase in the assimilation area of leaves, the yield and quality increase. However, the positive relationship between these two processes has a limit, at which a large leaf area, due to mutual shading, reduces the intensity of photosynthesis, as a result of which the unproductive part of the crop increases and productivity decreases [12-14]; In table.4 show the data in the maturation phase on the productivity of photosynthesis according to the variants of the experiment.

Table 4: Effect of ecophosphoazotine on the productivity of photosynthesis (in the maturation phase).

Experience options	Dry weight(dw_1), in the period with the appearance of 2-4 true leaves, g	Dry weight (dw_2) during ripening, g	Dry weight(dw_2-dw_1) growth over 90 days	leaf surface, m^2		Net productivity of photosynthesis, g/m^2
				At the beginning of the growing season (Ls_1)	At the end of the growing season (Ls_2)	
Control (traditional method)	1.3	145	143.7	0.00450	0.3544	8.8
Ecophosphoazotin 6 kg/ha pure	1.6	200	188.4	0.00379	0.4494	9.7
Ecophosphoazotin 12 kg/ha pure	1,0	275	274.0	0.00611	0,5834	10.3
(Least significant difference) LSD_{05} = 0.12 g/m^2;			(Error percentage) Er = 3.9 %			

Our studies show that when applied with sowing at doses of Ecophosphoazotine (6-12 kg/ha + min. convenient) at the beginning of the development of cotton plants, in the budding phase of cotton, differences in leaf area only begin to appear.

The area of cotton leaves in the budding phase ranges from 24.54–45.77 thousand square meters. m2/ha, and against the background of mineral fertilizers + Ecophosphatin 6-12 kg/ha, they reach from 25.86 to 45.77 thousand m^2/ha. At the beginning of the phase (formation of 2-4 true leaves), there is a tendency to increase the assimilation surface of the leaves, this is especially noticeable when applied against the background of mineral fertilizers + Ecophosphatin 12 kg/ha. Apparently, during this period, the effect of Ecophosphoazotin is only beginning to manifest itself [6].

The growth and photosynthesis of plants form the basis of a single production process, and the main indicator of the photosynthetic productivity of plants is their accumulation of dry mass in terms of a unit of continuous leaf area over a certain period [2, 37].

The leading role in the formation of yield belongs to the net productivity of photosynthesis (NPP), which characterizes the activity of the assimilation surface of leaves during the growing season. In this regard, the productivity of photosynthesis is widely studied under various soil and climatic conditions in order to elucidate the factors that increase the productivity of cultivated plants and limit its productivity.

The results of our research show that, on average, over the years of research in the flowering-fruiting phase of cotton, the net productivity of photosynthesis followed an ascending curve and ranged from 8.7 to 10.0 g/m^2•day, depending on the mineral fertilizer + ecophosphoazotin (6-12 kg /ha). In the fruit formation phase, the productivity of photosynthesis varied from 9.6 to 10.0 g/m^2•day, while in the control variant it was 8.7 g/m^2•day, which contributes to an increase in NPP by 0.9–1.3 g/m^2•day.

A number of authors found that as the area of leaves in crops increases, the NPP decreases. However, there are also opposite opinions.

The results of our studies show that an increase in leaf area did not lead to a sharp decrease in the productivity of photosynthesis. This can be explained by the fact that the maximum leaf area of cotton crops in the ripening phase was 58.34 thousand m^2/ha, which is optimal. A.A. Nichiporovich [7, 8] considers the limiting area of wheat leaves to be 40–50 thousand m2/ha, and cotton crops are higher than this crop. If the area is above this value, then the leaves are shaded, and the intensity of photosynthesis decreases. In addition, if the plant density and agricultural technology is optimal, then the leaves will not be shaded and the intensity of photosynthesis will not decrease.

To obtain high and high-quality cotton yields in saline and arid zones, it is necessary to create such favorable conditions in which the potential for photosynthetic activity of plants in agrocenosis would be maximally revealed.

Many authors [13, 17] consider the growth and development of plants as a process of differentiation of the organism due to the formation of new and increase in old elements of its structure (molecules, cells, tissues and organs), which is of decisive importance, influencing the distribution, redistribution and use of those formed during photosynthesis, metabolism.

Organic substances, as well as the absorption of mineral salts and water, which go to the formation of the surface of organs and tissues, their regeneration and reserve deposits.

Plant growth sums up and crowns many other processes of plant life, expressing to a certain extent the balance of the processes of synthesis and decomposition of substances in the body during its interaction with environmental conditions.

The growth of cotton and its biological productivity is the result, first of all, of photosynthetic activity, during which organic compounds are formed. Therefore, plant growth, formative, organ-forming and growth as an increase in dry biomass, begins mainly after the formation of the photosynthetic system of the leaf and the implementation of the photosynthesis process.

The leaf, as an organ of photosynthesis, is the center for the formation of primary products, their metabolization, and evacuation to storage organs [2, 15].

In the phase of flowering-fruit formation, more intensive growth and a significant increase in the assimilation surface of leaves were observed in all variants and varied from 35.24 - 40.80 to 45.57 thousand m^2/ha, and in the control variant - 35.24 thousand m^2/ha. A more intensive growth of the leaf surface was observed when applying min. fertilizer + ecophosphoazotin 12 kg/ha.

Thus, the increase in leaf area in these (2-3-) variants relative to the control was 29.31% (3-var) and 15.77% (2-var). In the flowering-fruiting phase, the leaf surface area was in the range of 36.6–42.9 thousand m2/ha, and on a fertilized background + ecophosphoazotin (6-12 kg/ha) 40.80–45.57 thousand m2/ha. At the same time, in all the studied variants, the leaf surface area was higher compared to the control by 5.56–10.33 thousand m^2/ha. We noted that the intensity of growth of the leaf surface during the entire growing season reached its maximum values when applied against the background of mineral fertilizers + ecophosphoazotin 12 kg/ha.

Analyzing the conducted studies, we found (see Table 4) that when applied against the background of mineral fertilizer with sowing of ecophosphoazotine in doses of 186-372 kg/ha (physically), at the end of the ripening period, the leaf surface, dry weight and photosynthesis productivity, respectively, were: 44.94- 58.34 thousand m^2/ha; 200-275g; 9.7-10.3 g/m^2•day, which is higher than the control (35.44 thousand m^2/ha) by 9.5-22.9 thousand m^2/ha; 55-130g; 0.9-1.5 g/m^2 • day.

To determine the influence of these factors on the weight of one bolus and the yield of cotton varieties Bukhara-10 using ecophosphoazotine, 100 test bolls were selected from all options before each harvest and determined by measuring the average weight.

According to the analysis of the results in the cotton variety Bukhara-10, on which ecophosphoazotin was used -186-372 kg / ha (physically), the average weight of one box in the Bukhara-10 variety was respectively: 8.1-8.3g, the yield for two harvests with different use of ecophosphoazotin according to compared with the control (43.1 c/ha; 7.9 g), respectively, was: 46.1-47.5 c/ha, which is higher by 3.0-4.4 c/ha; 0.2-0.4g; The best indicators for fiber yield were noted in the cotton variety Bukhara-10 when using ecophosphoazotine, the quality of the fiber, respectively, was: 35.9 - 36 mm; fiber yield 38.3-38.5%; in the control variants, respectively, was: 35.5 mm; 38% in relation to the control had a high rate of 0.4 -0.6mm; 0.3-0.5%;

CONCLUSION

Thus, the above studies can be concluded that one of the main reasons in the new natural bone meal ecophosphatin, which contains the presence of phosphorus, nitrogen, calcium, potassium, iron, zinc and 3 amino acids, which improves the distribution of nutrients in plants, as well as in saline soils by neutralizing the pH of the environment and as a result of the gradual intake of phosphorus throughout the organs of plants during the growing season of cotton, which leads to an increase in fruit elements due to better absorption of phosphorus by the plant than mineral fertilizers, their distribution depending on the leaf surface, the accumulation of dry matter and the accumulation of crop elements in one plant and the productivity of photosynthesis were respectively: 58.34 thousand m^2/ha; 275g/bush; 25 pcs/ bush; and 10.3g/m^2 • day; which is higher than the control by 22.9 thousand m^2/ha; 130g/ per bush; 5 pcs/bush; 1.5 g/m^2 • day.

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