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THE EFFECT OF NITROGEN FERTILIZERS ON BIOCHEMICAL PARAMETERS OF COTTON PLANTS GROWN ON SOILS WITH VARYING DEGREES OF SALINITY

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Annotation: In meadow alluvial soils, water loss from cotton plants is reduced when salinity is moderate to high. All rates of nitrogen fertilizers reduce water loss from cotton leaves in non-saline and weakly saline soils, and on the contrary, increase it relative to the background in moderately and strongly saline soils.

Key words: non-saline soils, slightly saline soils, cotton plant, stem height and leaf number, nitrogen fertilizers

The development of the root system of cotton plants in non-saline, non-salinate, moderately and strongly saline soils was determined in the budding and flowering phases and at the end of vegetation, the root weight was analyzed up to one meter of soil. For example, in studies conducted on non-saline soils, in the budding phase of cotton in the control variant of the experiment, when the layer thickness was 0-25 cm, it was 21.0 g/m2. When roots were determined towards the lower layers of the soil, that is, in the 25-70 cm layer, it was 5.3 g/m2. In this phase, the absence of root systems in the 70-100 cm layer was observed, which was observed in all salinity levels and in all variants of the experiment. In the background variant, where nitrogen fertilizers were not applied, the root weight slightly increased compared to the control, and was 23.3 g/m2. In the 25-70 cm layer of soil, this indicator was slightly higher than in the control, and amounted to 7.3 g/m2. The most convincing result was observed in the sixth variant with a background + N250 kg, which had a positive effect on the development of the root system, i.e. in the 0-25 cm layer it was 33.7 g/m2, and in the 25-70 cm layer it was 10.4 g/m2. This indicator was 441 kg per hectare. When the analysis of the cotton plant in the flowering phase was continued, in the 0-25 cm layer the dry weight of the root in the control variant was significantly higher than in the tillering phase, mainly due to the transition to the flowering phase, and was 44.1 g/m2. In the 25-70 cm layer, this indicator was 17.2 g/m2. In this variant, due to the lack of fertilizer application, it was determined that there were no roots in the 70-100 cm layer. In the background variant, where nitrogen fertilizers were not applied, when determining the amount of cotton in the 0-25; 25-70; 70-100 cm soil layers, it was 55.6; 20.3; 3.5 g/m2, according to the sequence of layers.

Among the variants where nitrogen fertilizers were used, the highest result was 84.6; 30.8; 5.6 g/m2, according to the sequence of layers above, when using background+N350 kg, while the most reliable result was obtained in variant 6 with background+N250 kg, according to the above, 83.0; 30.9; 5.2 g/m2. The dry weight of cotton roots per hectare of these layers was 1191 kg. At the end of the vegetation period, this indicator was 1342 kg in this variant (see Appendix 9).

When these studies were conducted on slightly saline soils according to salinity levels, the cotton in the combing phase in the 0-25 cm layer in the control variant was 18.1 g/m2, and in the 25-70 cm layer it was 4.0 g/m2. When these studies were conducted on slightly saline

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soils according to salinity levels, the cotton in the combing phase in the 0-25 cm layer in the control variant was 18.1 g/m2, and in the 25-70 cm layer it was 4.0 g/m2. In all fertilizer applications, the fertilizer application rate varied from 22.4 g/m2 to 33.7 g/m2 in the upper 0-25 cm layer, and from 6.2 g/m2 to 11.6 g/m2 in the 25-70 cm layer. The reliable result in this phase was also 31.6; 9.5 g/m2 in the experimental option with fon+N250 kg. In this option, it corresponded to 411 kg per hectare. This indicator was significantly lower than in non-saline soils. Although a slightly higher indicator was recorded in the flowering phase of cotton compared to the tillering phase, it was still significantly lower than in non-saline soils. For example, in the control option, it was 42.2 g/m2 in the 0-25 cm layer and 15.0 g/m2 in the 25-70 cm layer. In the remaining variants, the increase was higher in order, the best result was achieved when background + N_{250} kg was applied. Accordingly, it was 1122 kg per hectare. At the end of the vegetation period, the dry weight of the cotton root recorded the highest result, while the indicators were significantly lower in the background variant where nitrogen fertilizers were not applied and in the control variant where nitrogen fertilizers were not applied, but the results were high in all variants where nitrogen fertilizers were applied. Here, too, the most convincing result was achieved in the variant where background + N_{250} kg was applied, i.e. in the layers of 0-25; 25-70; 70-100 cm from top to bottom, it was 83.8; 36.8; 4.3 g/m2. The total yield across the layers was 118.5 g/m2, or 1,185 kg per hectare.

In the cotton boll phase, in the control variant without fertilizer application, it was observed that there was a dry weight of 179 kg of roots per hectare in a one-meter layer, while this figure was 221 kg in slightly saline soils. Compared to the control variant without fertilizer application, in the variants where 175 kg of phosphorus fertilizers and 125 kg of potassium fertilizers were applied, which serve to develop the root system, the dry weight of the roots at a depth of 1 meter was 232 kg. When nitrogen fertilizers were applied in different rates together with the background, these figures increased. Economic and reliable information In the 6th variant, i.e. the variant with background + N_{250} kg, it was found that there was a dry weight of 361 kg of roots per hectare. These figures increased significantly by the flowering phase. For example, in the control variant without fertilizer, 441 kg per hectare of land was applied, in the background variant 612 kg, in the background + N100; background + N150; background + N200; background + N250; background + N300; background + N350 variants, respectively, with increasing nitrogen rates, the dry weight of cotton roots by the end of the vegetation period was 593 kg per hectare in the control variant without fertilizer, and 0.7; In the background variant, applied at a rate of 0.5, it was 772 kg, when the nitrogen fertilizer rate was 100 kg, it was 901 kg together with the background, and when the background + N_{150} kg was applied, it was 955 kg. Increasing the nitrogen fertilizer rate also increased the effect on the dry weight of the cotton root. Here, too, the best result was achieved with background + N_{250} kg, i.e. 1112 kg per hectare.

For plant growth and development, highly saline soils had a very negative effect on the level of salinity. This also had an impact on the development of the root system. For example, in the budding phase of the cotton plant, the development of the root system in the control variant was 0-25 cm; 25-70; When determined in the 70-100 cm layers, the total was 14.4 g/m2. In all fertilizer applications, the difference compared to the control was sharp, that is, phosphorus 175, potassium 125 - 19.5 g/m2 in the background option, fon+N_{100}; fon+N_{150}; fon+N_{200}; fon+N_{250}; fon+N_{300}; fon+N_{350} kg options were 21.0; 22.3; 24.6; 27.7; 29.7; 30.2 g/m2, respectively. The increase in nitrogen fertilizers caused an increase in the dry weight of the cotton root, but in the experiment, the most reliable and economically justified option was 27.7 g/m2 in the

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background+N250 kg option. These indicators differed sharply from the results of the study conducted on non-saline, slightly saline and moderately saline soils. In the flowering phase of the cotton plant, these indicators were significantly lower in the control and background variants compared to the variant with the application of a small amount of nitrogen fertilizers. One of the main reasons for this was the absence of cotton roots in the 70-100 cm layer, which affected the overall result. When nitrogen fertilizers were applied, the indicators changed in a positive direction, from 59.8 g/m2 to 86.9 g/m2. The best reliable result was obtained at background + N250 kg, i.e. 80.2 g/m2. By the end of the growing season, these indicators were as follows: 49.5 in the control variant, 66.2 in the background variant, increasing from 80.8 g/m2 to 103.2 g/m2 when different rates of nitrogen fertilizers were applied, and the most convincing result was 98.8 g/m2 in variant 6.

In conclusion and recommendation, it can be said that,

1. In order to enhance cotton nutrition and accelerate physiological and biochemical processes in cotton plants, and increase the net productivity of photosynthesis in plants, it is advisable to apply nitrogen fertilizers at a rate of 250 kg/ha on the background of P175K125 on non-saline, weakly, moderately and strongly saline meadow alluvial soils.
2. As a result of improving the salt regime of saline, especially moderately and strongly saline meadow alluvial soils, measures to reduce salinity in these soils are recommended, taking into account the optimization of cotton plant nutrition and physiological processes of the plant, as well as an increase in crop yield.
3. It is recommended to improve the nitrogen regime on saline soils and, through it, the physiological indicators of cotton plants by applying nitrogen fertilizers at a rate of 250 kg/ha.
4. In order to accelerate the physiological processes in cotton plants on meadow alluvial soils of all salinity levels and obtain high yields due to this, it is recommended to apply nitrogen fertilizers against the background of phosphorus-potassium fertilizers P175 K125 at a rate of 250 kg/ha at the beginning of the 2-3-leaf, budding and flowering phases of the plant.

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