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THE INFLUENCE OF LEGUMES ON SOIL FERTILITY AND COTTON YIELD

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Annotation. In a short rotation scheme of 1:2, winter wheat + secondary crop (soybean): cotton: cotton is cultivated for two years; in a short crop rotation system of winter wheat: cotton, it is recommended to introduce soybean as a secondary crop after winter wheat.

Keywords: fertility, growth, cotton, wheat, soybean, mung bean, beans, peanuts, green peas, chickpeas, soil, humus, secondary sowing.

In irrigated areas, the main attention should be paid to sowing leguminous, grain and vegetable crops that improve soil fertility and meet the population's needs for food products. It has been established that annual forage crops, leaving organic matter of root and crop residues in the soil, contribute to an increase in soil fertility and an increase in cotton yields [6].

Under the conditions of a typical sierozem of the foothill plain of the Kashkadarya region, mung bean was grown as a repeat crop after winter wheat (the sowing rate was 40 thousand pcs/ha, the growing period was July 1). Due to the effective use of light radiation, the average yield was 19.3 c/ha, and with late sowing (July 15 and August 1), the yield was 17.2-15.3 c/ha [1].

The studies were conducted on light gray soils of the Andijan region, on the territory of the Andijan branch (UzNIIH). The area of the experimental plot is 2 hectares. The total area of the plot is 240 m2, of which the accounting area is 120 m2. Objects of study: irrigated gray soils, various legumes. Field experiments were conducted in 8 variants, with four repetitions.

Based on these field experiments, a dispersion analysis of the accuracy of the yield was made [3]. Checking the agrophysical (4) and agrochemical (5) properties of the soil was carried out according to established methods.

Among legumes, a relatively high amount of residues remains after mung bean, which amount to 12.4-32.5 and 9.6-30.3 c / ha, a total of 44.9-39.6 c / ha, residues 41.7-37.6 c / ha. The residues left in the soil from other crops were within the range of 25.2-28.9 and 23.2-27.2 c/ha.

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During the autumn plowing of stubble and root residues of repeated crops in the spring, the agrophysical properties of the soil were determined. Under the conditions (1-field), the bulk density of the soil before sowing seeds in the 0-30 and 30-50 cm layer in the control variant was 1.300-1.465 g/cm3, at the end of the cotton vegetation these indicators were 1.325-1.470 g/cm3 or increased by 0.025-0.005 g/cm3.

Should be noted that in all variants with sowing of repeated crops, the bulk density in the arable layer was less compared to the control. In the 2nd variant with sowing of corn, the bulk density in the arable (0-30 cm) soil layer in spring was 1.275 g / cm3, and in autumn 1.305 g / cm3, which is respectively higher by 0.025-0.020 g / cm3 compared to the control. After the soybean crop, the above indicators were 1.265-1.290 g / cm3, and after mung bean 1.260-1.280 g / cm3, which was relatively less than 0.025-0.020 g / cm3 compared to the 2nd variant.

Soil deterioration in the spring (control) in the arable soil layer was 48.2%, and in autumn it decreased to 46.6%, which is manifested due to the negative effect of the carried out agrotechnical measures. Among the repeated crops, corn has a relatively smaller effect on soil porosity, where in the 2nd variant, the porosity was 49.1% in spring and 47.2% in autumn, which is 0.9-0.6% higher than the control. Among the repeated crops, soybeans and mung beans have a relatively greater effect on soil porosity and, respectively, amounted to 49.3-49.8% and 47.8-48.4%, these indicators were higher than the control, which is 0.2-0.7 and 0.6-1.2% higher than the effect of corn. In the control variant, water permeability in the spring for 6 hours was 687 m3 / ha, and in autumn this indicator was 672 m3 / ha or decreased by 15 m3 / ha. When cultivating corn, the above indicators were 717; 694 m3 / ha, respectively, which is 30 and 22 m3 / ha higher than the control. And after cultivating soybeans and mung beans, water permeability was respectively 56-92 and 46-76 m3/ha higher compared to cultivating corn.

As a result, it can be noted that as a result of the decomposition of crop and forage residues in the soil before the spring period, they have a positive effect on the agrophysical properties of the soil.

In the variant without sowing repeated crops (control), the amount of humus in the 0-30 and 30-50 cm soil layer in the spring was 1.170-0.900%, respectively, and in the autumn period this figure decreased to 1.135%. A decrease in the amount of total nitrogen and phosphorus from 0.150-0.160% to 0.1400.150% is also observed, this decrease can be explained by their absorption by plants.

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The humus content at the end of the growing season of cotton sown after soybeans increased by 0.011%, total nitrogen by 0.018%, and phosphorus decreased by 0.010% compared to spring indicators. In the experiment, relatively optimal indicators were obtained when sowing after mung bean, where the humus content increased from 1.172 to 1.181% or by 0.009%.

The data obtained on the growth and development of cotton after sowing repeated crops (Figure 3), in the conditions of the 2nd field (2014) on August 1, the height of the stem in the control variant was 79.3 cm, the number of sympodial branches was 13.5 pieces and the number of bolls was 9.1 pieces, and when sowing cotton after corn, these indicators were 82.2 cm, 14.5 and 12, respectively, as well as 4.6 pieces or these data were close to the control. This can be explained by the fact that corn absorbs a greater amount of nutrients from the soil. In the experiment, relatively high indicators were obtained when sowing cotton after soybeans and mung beans, which overestimated the amount of stubble and root residues remaining in the soil and the amount of nutrients in their composition. In the 3rd and 4th variants, the height of the main stem (1.08) was 83.9-84.6 cm, the number of sympoidal branches was 14.9-15.5 pieces and the number of capsules (1.09) was 12.9-13.3 pieces, including 5.1-5.2 open pieces. The indicators of other variants were higher than the control, but they were close to each other. At the end of the growing season, in the 1st field, the real density of standing between the variants was 79.5-80.6 thousand pieces / ha, and in the 2nd after 79.4-80.1 thousand pieces / ha. However, in the conditions of the 2nd field, the difference in the yield of raw cotton of 1-2 c/ha in the variants is calculated due to an increase in the number of bolls by 1-2 pieces. Despite this, the difference between the variants remained.

The data on the yield of raw cotton of cotton plant sown after repeated crops are given. In the control variants (without sowing a repeated crop, cotton was sown after winter wheat), the average yields of raw cotton (in 4 replicates) in the fields were 30.1-32.9 c/ha, this difference depends on the conditions of the year. In experiments, a relatively high yield of raw cotton was obtained when sowing cotton after soybeans and mung beans, which amounted to (by year) 32.4-32.6 and 36.8-36.5 c/ha, respectively, where the yield increase was equal to 2.3-2.5 and 3.9-3.6 c/ha.

When analyzing the technological qualities of cotton fiber, in the control variant, the weight of 1000 pieces of seeds was 117.1 g, fiber length 33.1 mm, fiber yield 36.2%, fiber strength 4.74%, metric number 5860 and micronaire 4.8.

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When sowing cotton after soybeans and mung beans, the fiber quality indicators were relatively better compared to other options, where the fiber length was 33.3-33.3 and 33.2-33.2 mm, respectively, the fiber yield was 36.4-36.5 and 36.3-36.4% and micronaire was 4.7-4.7 and 4.6-4.6, these indicators were higher by 0.02-0.02 and 0.02-0.02 mm, 0.02-0.03-0.02-0.03 compared to the control.

This means that regardless of the types of repeated crops, they have a positive effect on soil fertility, resulting in an increase in the yield and technological indicators of cotton fiber sown after them. The profitability level was 53.6%, which is 5.4% more compared to sowing cotton after mung beans. This means that in the conditions of light gray soils of the Andijan region, in order to increase cotton yield and improve quality, as well as to achieve high profitability, cotton should be sown after repeated crops of soybeans or mung beans.

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