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THE EFFECT OF DIFFERENT AMMONIATED SIMPLE SUPERPHOSPHATE MINERAL FERTILIZERS ON THE GROWTH AND DEVELOPMENT OF COTTON

Jurayev Jasurbek Murodjon o'g'li

Andijan Institute of Agriculture and Agrotechnologies

Abstract: The study investigated the effect of different grades of ammoniated simple superphosphate, one of the most widely used types of phosphorus mineral fertilizers, on the growth and development of cotton.

Keywords: cotton, mineral fertilizer, superphosphate, Oltin ASSP, nitrogen, phosphorus, potassium.

The growth and development of cotton and the formation of yield components depend on soil fertility, soil moisture, temperature, the rate of nutrient application, and the irrigation rate. In an experiment conducted under the conditions of Andijan Region, the highest cotton yield, 40.3–43.3 centners per hectare, was obtained under a soil-moisture irrigation regime of 65-65-60% relative to field moisture capacity in both fertilizer treatments (NPK-250-175-125 and 150-105-75 kg/ha) [1].

Similar data were also reported in studies conducted in Fergana Region. In the treatment with a plant density of 80–90 thousand plants per hectare and mineral fertilizers applied at NPK-200-140- kg/ha, an average cotton yield of 42 centners per hectare was obtained over the years [2].

In addition, a number of researchers have studied the effects of sowing methods, plant density, and mineral fertilizers on cotton varieties, and corresponding recommendations have been developed [4].

Analysis of research data obtained for the Andijan-33 cotton variety on light sierozem soils of Andijan Region using the 90×10-1 and 90×10-1-2 sowing patterns showed that, during the season, the highest amount of cotton was harvested in all treatments with the 90×10-1 sowing pattern compared with the 90×10-1-2 pattern. In the treatments where mineral fertilizers were applied at NPK-250-175-125 kg/ha, the yield reached 37.8 c/ha, with an additional yield of 1.4–2.2 c/ha [5].

Under irrigated farming conditions, the growth and development of all agricultural crops, including cotton, largely depend on the sowing method established in the crop field, the plant density per hectare, natural factors such as temperature, light and air, soil factors, moisture and nutrient supply, as well as climatic conditions.

Research shows that when cotton seeds are sown by the conventional method on level land, cotton grows and develops very slowly. This is because the relatively low soil temperature causes slow seed emergence. In addition, a decrease in soil temperature caused by irrigation water, together with the adverse effect of the resulting soil-air conditions, leads to increased soil compaction. During the periods of true-leaf formation and the beginning of budding, the negative effects of soil crusts formed as a result of spring precipitation also cause cotton plants to lag behind in growth and development.

EXPERIMENTAL DESIGN

№	Treatment	P₂O₅ rate	Background (pure nutrient, kg/ha)
1	OLTIN ASSP	776 kg/ha 132 kg/ha (pure nutrient)	N-250 K-60

2	NAVOIY AZOT ASSP	776 kg/ha 132 kg/ha (pure nutrient)	N-250 K-60
3	FERGANA AZOT ASSP	776 kg/ha 132 kg/ha (pure nutrient)	N-250 K-60
4	Control: P ₂ O ₅ was not applied.	-	N-250 K-60

The research was conducted in the experimental training farm of the Andijan Institute of Agriculture and Agrotechnologies. The experiment consisted of 4 treatments with 4 replications. Each treatment plot was 10 m wide and 10 m long, giving a plot area of 100 m². The area of one replication was 400 m², and the total experimental area was 1,600 m². The field experiment was conducted according to the experimental design presented above. According to the experimental results, the best performance was observed in Treatment 1, where Indorama Oltin ASSP was applied. During the phenological observation on June 1, cotton plant height was 16.6 cm and the number of true leaves was 5.9. By July 1, the main stem height had reached 50.6 cm, the number of fruiting branches was 5.1, and the number of buds was 9.2.

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№	Treatments	June 1		July 1			August 1				September 1	
		Main stem height, cm	Number of true leaves, pcs.	Main stem height, cm	Number of fruiting branches, pcs.	Number of buds, pcs.	Main stem height, cm	Number of fruiting branches, pcs.	Yield components, pcs.	Number of bolls, pcs.	Bolls, pcs.	Of which opened, pcs.
1	Oltin ASSP	16,6	5,9	50,6	5,1	9,2	107,3	12,9	16,8	6,4	14,2	9,7
2	Navoi Azot ASSP	16,3	5,5	44,6	4,9	7,5	101,4	12,1	14,4	5,1	9,8	7,7
3	Fergana Azot ASSP	16,5	5,5	49,1	5,0	8,1	87,0	12,8	15,7	5,6	10,2	8,0
4	Control	13,2	3,7	43,5	4,1	6,8	77,0	10,5	10,8	3,7	7,0	5,8

At the third phenological observation, where this fertilizer was applied, the main stem height reached 107.3 cm, the number of fruiting branches was 12.9, the number of yield components was 16.8, and the number of bolls was 6.4. Compared with the control, these indicators were higher as follows: in the phenological observation on June 1, main stem height was higher by 3.4 cm and the number of true leaves by 2.2; in the observations on July 1, main stem height was higher by 7.1 cm, the number of fruiting branches by 1.0, and the number of buds by 2.4; in the observations on August 1, main stem height was higher

by 30.3 cm, the number of fruiting branches by 2.4, the number of yield components by 6.0, and the number of bolls by 2.7; and in the final observations on September 1, the number of bolls was higher by 7.2, of which 3.9 were opened.

In conclusion, according to our experiment on the effect of different grades of superphosphate on the growth and development of cotton, among the ammoniated simple superphosphate mineral fertilizers, the treatment with “Oltin” ammoniated simple superphosphate mineral fertilizer produced by “Indorama Kokand Fertilizers and Chemicals” LLC achieved the highest indicators during the period of phenological observations.

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