

## Scientific Justification of the Effect of Nitrogenous and Organic Fertilizers on High Yield Cultivation of Potatoes

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**Annotation:** Feeding with nitrogenous and phosphoric fertilizers during the growing season of potatoes increases the productivity of the crop and improves its quality. However, if the potato is fed with nitrogen fertilizers in a large amount, the yield will increase, and at the same time, the leaves will grow, the above-ground part of the plant will grow strongly, the growing period will be extended, and the ripening of the buds will be delayed. In addition, the amount of starch deteriorates. It decreases at the end, and its storability deteriorates.

**Key words :** Planting dates, depth, planting patterns, bush development, density, mineral nutrition, soil fertility, growth, development, yield, productivity of potato varieties.

**Enter.** As a result of fundamental reforms implemented in the agriculture of our country during the years of independence, the volume of production increased more than 2 times. Despite the fact that the population of our country has increased by almost 10 million people or more than 30 percent, the per capita consumption of meat is 1.3 times, milk and dairy products are 1.6 times, potatoes are 1.7 times, and vegetables are more than 2 times. , made it possible to increase fruits almost 4 times. Judging from the above, the cultivation of additional products in farms depends on the fertility of the soil. Therefore, the fertility of the soil is important in order to increase the fertility of the soil and to provide the population with food products, therefore, in order to increase the fertility of the soil, it is necessary to control the fertilizers applied to the soil and fertilize on a scientific basis.[4.5]

The farmers of Surkhandarya region, which is located in the south of our country, have been making their due contribution to ensure the abundance of food on the table and in our markets. productivity is decreasing, which leads to a lack of food products for the population, limiting the possibility of obtaining the desired amount of crops from the land. The amount of organic and nitrogenous fertilizers is primary for obtaining a high and quality crop from plants.[5]

Field experiments and production tests were conducted and tested in the conditions of gray soils scattered in the territory of Surkhandarya region. The experiment was carried out in 2021-2023 and the effect of nitrogenous and organic fertilizers on the yield of potatoes on gray soils was studied. The area allocated for each variety was 30 m<sup>2</sup>, and the number of options was 4. The tested variety was planted on February 15 at a depth of 70x25, 6-8 cm. ng) and the amount of the obtained yield was monitored. [6]

Among the foreign scientists on potato cultivation and fertilizer application, N.N. Balashev (1963, 1976), Ye.G.Luchinina (1978), V.I.Zuyev, and in our country A.Abdullayev (1987), D.T.Abdukarimov (1971, 2005, 2007), O.Kadirkhojaev,

It was studied by Kh. Ch. Boriyev, B. B. Azimov (2005, 2009), T. E. Ostonakulov, A. Kh. Khamzayev, I. S. Amonturdiyev, S. Kh. Ishimov (2014) and others. However, for the first time, studies were conducted on determining the favorable standards of organic and nitrogen fertilizers for the yield of potatoes in the conditions of light gray soils spread in the Surkhandarya oasis of the Southern region of our country. According to the results of the literature analysis, the effect of mulching with manure at different planting periods on the growth, development and yield of sweet potato in the South Surkhandarya oasis has been partially studied. According to the research conducted by

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O.T.Alimardonov, D.T.Abdukarimov in Angor district of Surkhondarya region under the conditions of old irrigated light-colored, gray soils, regionalized medium-fast maturing potatoes Nevsky, brought from Holland, and widely promising Sante, Romano varieties are seeds of local 3rd reproduction varieties. indicators of growth and development of hair follicles were studied.[7]

I. Mamarasulova and others in the conditions of old irrigated typical gray soils of Zarafshan farm, Kitab district, Kashkadarya region, at an altitude of 1042-1048 meters above sea level, fairy potatoes Sante, Condor, Mondial, Bakhro-30. The growth, development, productivity and productivity of Granola, Licaria, Kuvonch-16/56 m, and Latona varieties were studied by planting in 3 different fertilizer conditions and planting thickness.[6]

According to the experiments of I. Mamarasulova and T. Ostonakulov, in the field experiments conducted in the conditions of typical gray soils that have been irrigated for a long time, 3 varieties of potatoes: Sante, Condor, Mondial, Bakhro-30, Granola, Licaria, Kuvonch-16/56 m, and Latona The highest product was studied under conditions of fertilizer N200P 160K100, 20 t/ha manure + N100 PRO K 50 and 20 t/ha + N200P 160K 100 kg/ha) and planting thickness (41700 and 71400) (27.5-32.6 t/ha) and seed-bearing (14.0-17.7 t/ha) productivity, 20 tons of manure per hectare + N200R 160K100 KG of fertilizers are applied, and seeds 70 cm buds were obtained when planted in a scheme of 70x20 cm.

Fertilizing potatoes (*Solanum tuberosum*). It is recommended to apply organic fertilizers at the rate of at least 20 tons per hectare on all types of soil. The annual rate of nitrogen is reduced by 20-25% in the first year of crop planting by growing perennial grasses and cutting them. The annual rate of organic fertilizers, 75-80 percent of phosphorus fertilizer and the annual rate of potash fertilizer are given during autumn plowing or plowing the land before summer sowing if the crop is repeated. , the rest of phosphorus is applied during planting.

20 percent of the annual norm of nitrogen fertilizers is given during the planting of potatoes, 30 percent when the sprouts turn green, and the remaining 50 percent during the flowering period of the plant. The most suitable types of nitrogen fertilizers for potato crops are ammonium sulfate and potassium sulfate from potash fertilizers.

**Table\_1 Climatic conditions of the years of the research, data from the Meteorological Station "Surkhandarya Region".**

**Oltinsoy district air temperature**

Years	Monthly average												Average or annual
	01	02	03	04	05	06	07	08	09	10	11	12	
<b>Air temperature °C</b>													
Many years	4,0	6,7	13,5	19,3	26,4	32,2	35,4	30	24,5	20,1	11,2	6,5	19,2
2021	7,5	7,9	13,3	18	24,7	29,1	32,1	33,1	31,1	25,9	20,1	14,1	21,1
2022	7,8	9,4	14,3	22,4	25,1	31,2	33,2	32,1	29,1	26,4	22,2	15,	22,35
2023	7,1	7,5	12,5	21,2	25,5								
<b>Relative air humidity %</b>													
Many years	80	76	66	57	44	35	34	36	43	50	68	79	56
2021	79	85	66	62	46	37	33	34	40	48	67	78	56
2022	81	65	59	50	39	30	35	34	37	50	70	83	52
2023	82	73	67	55	43								
<b>Precipitation, MM</b>													
Many years	23,5	20,2	37,7	26,4	9,8	0,8	0,6	0,0	0,2	3,3	8,8	17,4	147,3



2021	12,5	32,2	47,7	22,3	8,4	3,1	-	-	-	-	26,5	18,4	148,9
2022	14,6	27,8	48,1	23,4	9,5	3,1	-	-	-	-	23,4	19,5	217,1
2023	43,2	28,4	100,1	45,1	15,4								

In our research conducted in 2021-2023 in the conditions of light gray soils scattered in Oltinsoy district of Surkhandarya region, the area of the plot for each option was 30 m<sup>2</sup>, and the number of options was 4. All tested options were planted on February 10 at a depth of 6-8 cm in a scheme of 70x25 cm. The area of each option is 30 m<sup>2</sup>, and 120 potato plants were planted in the total area of options. Fertilizers were not applied to option 1, that is, it was taken as a control option. 20 tons of manure and N0 P0 K0 (Nitrogen, Phosphorus, Potassium) were not applied to the 2nd option. On the 3rd option, when mineral fertilizer was used in the proportion of N150 P120 K75, no organic fertilizers were applied, and on the 4th option, 20t/ha of manure and N200 P150 K75 fertilizers were mixed and the experiment was carried out. was held.[6]

Under these conditions, on the 30-33rd day of the growing period of the evaluated potato variety, in the 0-20 cm layer of the soil, the root mass of one plant was 13.5-19.0 grams and the volume was 14.5-20.1 cm<sup>3</sup> on the 40-63 days of the growing period, it increases according to the law, and on the next 70-73 days of the growing period, the mass of the root per bush is 18.0-25.7 grams and the volume is 18.3-29 It turned out to be .5 cm<sup>3</sup>.

In the studied potato varieties, on the 50-53rd day of the growing season, the weight of the stalk per plant decreased by 1.1-1.2 times compared to the weight of the tuber, and on the 85th-93rd day of the growing season (17-20.05), the variety developed It was found that the energy yield was high. The crop was harvested in 110-120 days. The yield of the 1st variant was 45 kg (ha/15 t). The yield of the 2nd variant was 57 kg (ha/19 t) 59 kg (ha/19.5 t) in option 3, and 66 kg (ha/22 t) in option 4.[5]

**In conclusion**, it can be said that In different soil and climatic conditions, especially in the conditions of the Northern and Central regions of our republic, the growth productivity of different varieties of fairy potatoes, seed quality and biochemical composition of tubers, planting periods and depth, planting schemes, bush development, thickness, mineral nutrition, irrigation regime, etc. the effects of the activities have been studied.

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