

ECONOMIC EFFICIENCY OF AGROTERNIAL MEASURES FOR GROWING MEXICAN DATURA INNOXIA

Pulatov Sarvar Mustafayevich

Head of the Department of the Tashkent Branch of the Samarkand State University of Veterinary Medicine, Animal Husbandry and Biotechnology, Doctor of Philosophy, Professor

Taylonov Bakhtiyor Numonovich

Deputy Director of School 15 in the City of Shakhrisabz, Kashkadarya Region

Abstract

Fertilization of *Datura innoxia* is used to provide it with nutrients throughout its growth period, especially during the period of high demand for nutrients: budding and flowering. The main part of the planned fertilizer rate of basic fertilizers is introduced into the soil. Depending on the soil-climatic conditions of the place where the plant is planted and some economic and organizational problems, basic fertilization is carried out more often in autumn, and in some cases in spring. This article presents information on the economic efficiency of agrotechnical measures for growing *Datura innoxia*.

Keywords: *Datura innoxia*, plant, agrotechnical measures, fertilizers, economy, growth, development, care, cost, leaf, seed.

Introduction

The economic efficiency of the rates and types of nitrogen fertilizers used in the cultivation of *Datura innoxia*, depending on the agrotechnical measures, is presented in Tables 1 and 2.

It should be noted that the price level of 2025 was taken into account when calculating the economic efficiency of the agrotechnical measures used in the cultivation of *Datura innoxia*. For example, the selling price of 1 kg of dry leaves of *Datura innoxia* was set at 70 thousand sum, while the selling price of 1 kg of seeds was 50 thousand sum. The costs of mineral fertilizers used, fuel, seeds, and labor were also taken into account.

According to calculations on economic efficiency, in the control variant, where mineral fertilizers were not applied to the *datura innoxia* plant, the leaf yield was 6.87 c/ha for 3 years, the total income from its sale was 48,090 thousand sum/ha, total costs were 34,400 thousand sum/ha, a conditional net profit of 13,690 thousand sum/ha was obtained, and the profitability level was 39.0%.

In the case of growing *Datura innoxia*, in which the rate of phosphorus and potassium fertilizers P90K90 kg/ha was used, the leaf yield was 8.42 kg/ha, the total income from its sale was 58,940 thousand sum/ha, the total costs were 36,300 thousand sum/ha, and a conditional net profit of 22,640 thousand sum/ha was obtained, and the profitability level was 62.0%.

In the cultivation of *Datura innoxia*, against the background of the application of phosphorus and



potassium fertilizers at the rate of P90K90 kg/ha, nitrogen fertilizer in the form of ammonium sulfate was used. The highest economic efficiency indicator was observed in the variant with the application of mineral fertilizers at the rate of N120P90K90 kg/ha, with a leaf yield of 10.84 kg/ha, total income from its sale of 75,880 thousand sum/ha, total expenses of 42,400 thousand sum/ha, a conditional net profit of 33,480 thousand sum/ha, and a profitability level of 78.0%. In the case of the application of nitrogen fertilizers in the form of ammonium sulfate at the rate of 150 kg/ha, the yield of leaves was 10.46 t/ha, the total income from its sale was 73,220 thousand sum/ha, the total costs were 44,300 thousand sum/ha, and the conditional net profit was 28,920 thousand sum/ha, and the level of profitability was obtained. It was 65.0%. In the case of using nitrogen fertilizer in the form of ammonium sulfate at the rate of 60 kg/ha, the leaf yield was 9.42 t/ha, the total income from its sale was 65,940 thousand sum/ha, the total costs were 38,600 thousand sum/ha, conditional net profit was 27,340 thousand sum/ha, and the profitability level was 70.8 made up %.

Against the background of the application of phosphorus and potassium fertilizers at the rate of P90K90 kg/ha, the highest indicators of economic efficiency in the variants where nitrogen fertilizer in the form of urea was applied were observed in the variant where the rate of mineral fertilizers N90P90K90 kg/ha was applied, and the leaf yield was 10.30 c/ha, the total income from its sale was 72,100 thousand sum/ha, total expenses were 40,500 thousand sum/ha, a conditional net profit of 31,600 thousand sum/ha was obtained, and the profitability level was 78.2%. In the case of the application of nitrogen fertilizers in the form of urea at the rate of 150 kg/ha, the leaf yield was 10.1 tons/ha, the total income from their sale was 70,700 thousand sum/ha, the total costs were 44,100 thousand sum/ha, and the conditional net profit was 26,600 thousand sum/ha, and the level of profitability was It was 60.3%. In the case where nitrogen fertilizer was used in the form of urea at the rate of 60 kg/ha, the leaf yield was 9.1 tons/ha, the total income from its sale was 63,700 thousand sum/ha, the total costs were 38,300 thousand sum/ha, conditional net profit was 25,400 thousand sum/ha, and the profitability level was 66.3 made up %.

In the cultivation of *Datura innoxia*, against the background of the application of phosphorus and potassium fertilizers at the rate of P90K90 kg/ha, nitrogen fertilizer in the form of ammonium nitrate was used. The highest indicators of economic efficiency were observed in the variant with the application of mineral fertilizers at the rate of N120P90K90 kg/ha, the leaf yield was 10.29 centners/ha, the total income from their sale was 72,030 thousand sum/ha, total expenses were 42,000 thousand sum/ha, a conditional net profit of 30,030 thousand sum/ha was obtained, and the profitability level was 71.0%.

Table-1 Economic efficiency of using different nitrogen fertilizers in growing Datura innoxia Mill.

Order of options	Nitrogen fertilizer types	Mineral fertilizer norms, kg/ha	Average leaf yield in 3 years, ts/ha	Additional yield compared to the control, ts/ha	Funds from the sale of leaf crops, thousand sum/ha	Total costs, thousand sum/ha	Conditional net profit, thousand sum/ha	Profitability rate, %
1	No fertilizer (control)		6,87	-	48.090	34.400	13.690	39,8
2	P ₉₀ K ₉₀ (background)		8,42	1,55	58.940	36.300	22.640	62,3
3	(NH ₄) ₂ SO ₄ Ammonium sulfate	N ₆₀ P ₉₀ K ₉₀	9,42	2,55	65.940	38600	27.340	70,8
4		N ₉₀ P ₉₀ K ₉₀	10,30	3,43	72.100	40.500	31.600	78,2
5		N ₁₂₀ P ₉₀ K ₉₀	10,70	3,83	74.900	42.400	32.500	76,7
6		N ₁₅₀ P ₉₀ K ₉₀	10,46	3,59	73.220	44.300	28.920	65,3
7	CO(NH ₂) ₂ Urea	N ₆₀ P ₉₀ K ₉₀	9,10	2,23	63.700	38.300	25.400	66,3
8		N ₉₀ P ₉₀ K ₉₀	9,52	2,65	66.640	40.250	26.390	65,6
9		N ₁₂₀ P ₉₀ K ₉₀	10,55	3,68	73.850	42.150	31.700	75,2
10		N ₁₅₀ P ₉₀ K ₉₀	10,10	3,23	70.700	44100	26.600	60,3
11	NH ₄ NO ₃ ammonium nitrate	N ₆₀ P ₉₀ K ₉₀	8,84	1,97	58.800	38.000	20.800	54,5
12		N ₉₀ P ₉₀ K ₉₀	9,21	2,34	64.470	40.500	24.420	60,9
13		N ₁₂₀ P ₉₀ K ₉₀	10,29	3,42	72.030	42.000	30.030	71,5
14		N ₁₅₀ P ₉₀ K ₉₀	9,85	2,98	68.950	43.950	25.000	56,9

Table-2 Economic efficiency of using different nitrogen fertilizers in the cultivation of Datura innoxia Mill in terms of seed yield

Option order	Nitrogen fertilizer types	Mineral fertilizer standards, kg/ha	Average seed yield in 3 years, ts/ha	Additional yield compared to control, ts/ha	Funds from the sale of seed crops, thousand sum/ha	Total costs, thousand sum/ha	Contingent net profit, thousand sum/ha	Profitability rate, %
1	No fertilizer (control)		9,6	-	48.000	34.550	13.450	38,9
2	P ₉₀ K ₉₀ (background)		11,4	1,8	57.000	36.450	20.550	56,4
3	(NH ₄) ₂ SO ₄ Ammonium sulfate	N ₆₀ P ₉₀ K ₉₀	14,0	4,4	70.000	38.750	31.250	80,6
4		N ₉₀ P ₉₀ K ₉₀	15,8	6,2	79.000	40.650	38.350	94,3
5		N ₁₂₀ P ₉₀ K ₉₀	17,0	7,4	85.000	50.550	34.450	68,2
6		N ₁₅₀ P ₉₀ K ₉₀	16,0	6,4	80.000	44.450	35.550	79,8
7	CO(NH ₂) ₂ Urea	N ₆₀ P ₉₀ K ₉₀	13,3	3,7	66.500	38.450	28.050	72,3
8		N ₉₀ P ₉₀ K ₉₀	14,6	5,0	73.000	40.000	33.000	82,5
9		N ₁₂₀ P ₉₀ K ₉₀	16,0	6,4	80.000	44.300	35.700	80,6
10		N ₁₅₀ P ₉₀ K ₉₀	15,8	6,2	79.000	48.400	30.600	63,2
11	NH ₄ NO ₃ ammonium nitrate	N ₆₀ P ₉₀ K ₉₀	13,0	3,4	65.000	38.150	26.850	70,4
12		N ₉₀ P ₉₀ K ₉₀	14,0	4,4	70.000	40.200	29.800	74,1
13		N ₁₂₀ P ₉₀ K ₉₀	15,8	6,2	79.000	44.150	33.850	76,7
14		N ₁₅₀ P ₉₀ K ₉₀	15,4	5,8	77.000	46.100	30.900	67,0

In the variant where nitrogen fertilizers were applied in the form of ammonium nitrate at a rate of 150 kg/ha, the leaf yield was 9.85 c/ha, the total income from their sale was 68,950 thousand sum/ha, the total costs were 43,950 thousand sum/ha, a conditional net profit of 25,000 thousand sum/ha was obtained, and the profitability level was 56.0%.

The data obtained on the seed yield of the Datura innoxia plant were similar when calculated economically. However, the selling price of 1 kg of datura seeds was set at 50 thousand sum. In addition, the production costs of growing the seed crop were 0.54-0.56% higher than the production costs of growing the leaf crop due to the higher amount of additional crops.

The highest economic efficiency in the cultivation of seeds was obtained when applying



ammonium sulfate at a rate of 90 kg per hectare against the background of mineral fertilizers P90K90 kg/ha, the conditional net profit was 38,350 thousand sum/ha, and the profitability level was 94.3%.

In general, the most economically efficient option for growing *Datura innoxia* is to apply ammonium sulfate at a rate of 90 kg per hectare against the background of mineral fertilizers P90K90 kg/ha, which provides high economic efficiency.

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