

Agrotechnology Of Growing Medical Salvia (Salvia Officinalis L.) Seedlings Under The Influence Of Mineral Fertilizers In Tashkent Region

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Abstract – In this article, it was found that different standards of mineral fertilizers used to accelerate the medicinal salvia cultivation in the soil and climatic conditions of Tashkent region affect the plant seeds yield. The N₉₀P₆₀K₄₀ norm gave good results for the plants rapid growth when fed with different norms of applied mineral fertilizers. In this case, the data on the cultivation technology of seed seedlings of salvia plant are given.

Keywords – Salvia, Agrotechnology, Mineral Fertilizers, Raw Materials, Soil, Care, Productivity, Growth And Development Rate.

I. INTRODUCTION (TOPIC RELEVANCE)

For the industrial plantations establishment of medicinal plants, it is necessary to develop agrotechnologies for the varieties selection and cultivation adapted to local soil and climatic conditions, as well as to create sufficient conditions for the plants biological potential manifestation.

It should also be noted that due to the limited reserves of naturally growing medicinal plants, the growing demand of the pharmaceutical industry for raw materials for medicinal plants in the future can be met mainly through the medicinal plants cultivation.

As stated in the Resolution of the President of the Republic of Uzbekistan on April 10, 2020 PR No-4670 "On measures for the protection, cultivation, processing and rational use of available resources of wild-growing medicinal plants" in recent years, consistent reforms have been carried out in the medicinal plants protection field, rational use of natural resources, the establishment and processing of plantations where medicinal plants are grown [1].

The resolution of the President of the Republic of Uzbekistan "On measures to expand the scope of scientific research on the cultivation and processing of medicinal plants, their seed production development" (PR 4901, 26.11.2020) was adopted. According to the resolution, "Agrotechnology of medicinal plants cultivation" direction will be opened in all colleges and technical schools specializing in agriculture[2].

II. RESEARCH OBJECT AND METHODOLOGY.

The object of study was the medicinal plant salvia (*Salvia officinalis* L.). Commonly used methods were used in the studies. B.A.Dospekhov. [3], (Borisova, Beydeman, Ponomarev, Zaytsev, Yarosh, Terekhin, Torikov V.E. and etc.) [4]. During the study, the yield of medicinal salvia seeds was studied. The research was conducted in 2020 in the experimental field of Chatkal branch of the Saksonota state forestry enterprise, Tashkent region. The experimental field soils were typical gray soils, and according to the agrochemical analysis of the soils, the humus content in the tillage layer was 1.54%, total nitrogen 4.75%, total phosphorus 35 mg/kg, and potassium 204 mg/kg [5].

III. RESEARCH RESULTS AND THEIR DISCUSSION

N₃₀P₆₀K₄₀, N₆₀P₆₀K₄₀ and N₉₀P₆₀K₄₀ mineral fertilizer norms were applied in order to accelerate the cultivation of medicinal salvia plant seed seedlings. Fertilizer free field was obtained as a control option. In each variant, protective rows, observable model plants (at least 10) were identified, phenological observations of the medicinal salvia plant, biometric measurements were carried out (Fig. 1).



Figure 1. General view of medicinal salvia seed seedlings in the experimental area

A. The mineral fertilizers effect on medicinal salvia seedlings

In the second year of the study, when a single model of medicinal salvia seeds was applied according to the mineral fertilizers norms for the plant, it was as follows: in the fertilizer free control variant, the number of branches was 13, the leaves number was 265, the root length was 218 cm and the leaf surface was 12.5 cm². In the second variant, these figures were 14 branches, 283 leaves, 252 cm in root length and 13.7 cm² in leaf area. In the third variant, the branches number was 16, the leaves number was 341, the root length was 284 cm and the leaf surface was 15.8 cm². In the fourth variant, these figures were 17 branches, 17 leaves, 334 cm in root length and 18.2 cm² in leaf area. The branches number relative to the control was 1.3; leaves number and root length 1.5; increased the surface area of the leaf by 1.4 times, or 145%. (table1).

Table 1. The effect of mineral fertilizers on the medicinal salvia plant.

Options	For a single model plant			
	number of leaves, pcs	number of branches, pcs	root length, cm	* Leaf surface, cm ²
Control	265	13	218	12,5
N ₃₀ P ₆₀ K ₄₀	283	14	252	13,7
N ₆₀ P ₆₀ K ₄₀	341	16	284	15,8
N ₉₀ P ₆₀ K ₄₀	419	17	334	18,2

* in determining the leaf surface was carried out by A.V.Nichiporovich method (1972).

B. Yield indicators of seedling development of Salvia plant

The diagonal method was used to determine the yield in medicinal salvia seedlings in the experimental fields. The medicinal salvia seedlings yield was collected on the basis of 4 variants of 3 returns per 1m² and measured wet. After determining the wet weight of the raw material, it was dried and re-measured and the yield was determined for 1 kg/ha average.

The salvia seedlings effect on variants in the different norms application of mineral fertilizers was determined. In this case, the dry mass of raw material of medicinal salvia seeds per 1 m² (leaf) was 233.5 g in the control variant, 2335 kg per hectare, in the fourth variant per 1 m², 300.7 g per area; 3007 kg/ha. Compared to the control, the dry mass of the plant increased by 1.2 times, or 128%.

The dry mass of flowers is 85.2 g, 852 kg/ha under control in 1m² area; in the variant applied by the mineral fertilizers norms N₉₀P₆₀K₄₀ was 123.4g per 1m², 1234 kg per hectare. It was observed that the dry mass of flowers was 1.4 times higher than the control, which was 144% higher.

Cultivated salvia seeds 42.5 g per 1m² of control, 425 kg per hectare; in the second variant 46.0 g, 460 kg per hectare; in the third variant 52.5g, 525 kg/ha; in the fourth variant it was 61.5g, i.e. 615 kg/ha (Table 2).

Table 2. Yield of medicinal salvia seeds per 1 m² of area (leaves), raw materials for flowers and seeds

Options	Dry mass of leaves		Dry mass of flowers		Seeds	
	In 1m ² ,g	kg/ha	In 1m ² ,g	kg/ha	In 1m ² ,g	kg/ha
Fertilizer free	233,5	2335	85,2	852	42,5	425
N ₃₀ P ₆₀ K ₄₀	246,1	2461	92,8	928	46,0	460
N ₆₀ P ₆₀ K ₄₀	285,3	2853	105,5	1055	52,5	525
N ₉₀ P ₆₀ K ₄₀	300,7	3007	123,4	1234	61,5	615

IV. CONCLUSION

In order to accelerate the medicinal salvia seeds cultivation in the soil and climatic conditions of Tashkent region, various standards application of mineral fertilizers increased the number of plant branching by 1.3 times, leaf count and root development by 1.5 times, i.e. by 151%, leaf level by 1.4 times that is, it increased by 145%.

N₉₀P₆₀K₄₀ norms Application of mineral fertilizers in medicinal salvia plant yield increased by 1.2 times, i.e. 128%, compared to the dry mass control of raw material per 1m² area (leaf).

It was observed that the dry mass of plants flowers and seeds was 144% higher than the control per 1m² area.

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