

# The Influence Of Sowing Scheme And Biostimulators On Root-Fruit Yield

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**Abstract:** In this article, Uzbekistan-83 variety of fodder beet was planted in three different sowing schemes: 70x15-2, 70x20-2, 70x25-2, and the effect of Tandem biostimulator on the development of roots was studied. Tandem biostimulant application at a low rate of 0.4 liters per hectare led to an increase in root fruit yield, while Fitovak (Etolon) biostimulant was used at a rate of 300 ml/ha to show a high rate.

**Keywords:** fodder beetroot, biostimulator, norm, root-fruit, leaf, etolon.

## Introduction

In order to strengthen the feed base in the development of animal husbandry, the most important tasks are the effective use of available fodder crops, increasing the yield of nutritious crops and organizing seed production. Today, improvement of animal husbandry at the level of modern requirements, increase of productivity of livestock, as well as creation of feed base that meets the demand of animals is one of the urgent problems of this industry.

Fodder beetroot is a juicy, easily digestible and nutritious fodder. Carbohydrate-free extractives store mineral salts and vitamins [3].

The leaves of root crops are also important for livestock, their leaves are nutritious and contain a lot of vitamins [4].

In the first year, beet produces a thickened rhizome and 50-90 leaves. The process of development from seed to seed passes through 11 successive stages of organogenesis [5].

The origin of beetroot (*Beta vulgaris* convar. *Crassa* L.) - the island of Sicily in southwestern Europe [21] - determines the strong dependence of its yield on moisture conditions. Therefore, when grown in the central part of Russia, where there is no black soil, the yield of the crop varies greatly from year to year due to the uneven distribution of precipitation during the growing season. It is possible to reduce this dependence and ensure the planned harvest with the help of physiological means of growth regulation, which help the accumulation of phytochemicals in the important stages of plant development [17, 15, 20, 23].

## Materials And Methods

Scientific research work was carried out in 2022 in the fields of experimental scientific research and educational experimental field of Tashkent State Agrarian University.

The soil of the experimental farm is a typical sierozem soil that has been irrigated since ancient times. This soil contains about 0.715-0.920% humus, about 0.065-0.083% nitrogen, about 0.134-0.152% phosphorus and about 0.148-0.154% potassium. The mobile forms of nutrients in the experimental field are N-NO<sub>3</sub> 3.1-4.7 mg/kg, P<sub>2</sub>O<sub>5</sub> 40.3-41.7 mg/kg, and K<sub>2</sub>O 140.0-180.7 mg/kg. non-saline, and this soil differs in water permeability, softening complexity.

In the field experiment, Fodder beet Uzbekistan-83 variety with 15 variants was planted in 3 repetitions. The area of each plot is 28.0 m<sup>2</sup>, the total area of the experiment is 0.12 ha. Fitovak (standard) 300 ml/t, Tandem 0.3, 0.4, 0.5 ml/t were applied to the seeds before sowing beets, twice, during the growing season at the rate of 0.3, 0.4, 0.5 liters/ha.

Based on the goals and tasks of the experiments, phenological observations and calculations were carried out on Uzbekistan-83 varieties of fodder beets.

Tandem preparation is a concentrate of humic and fulvic acids with added Auxin, Cytokinin, Aversectin phytohormones. Produced under the supervision of Agrobiotech (Germany). A modern, high-concentration humic preparation that simultaneously combines the functions of fertilizer, protection and plant growth. The

active ingredients of the preparation have high biological activity and are in a form that is almost completely absorbed by plants. The preparation accelerates the formation of beneficial bacteria in the soil, thereby improving the structure and biological indicators of soil fertility, blocking the flow of radionuclides and heavy metals to the soil and plants. Environmentally safe for humans, animals, fish, insects.

Fitovak is an immunostimulant that strengthens the physiological and biochemical protective reactions of plants, activates the passive immunity in agrocenosis, and increases seasonal endurance until the end of the growing season.

Fitovak has a "bio" fungicidal property and can be used as a phytovaccine, stimulating plant defense reactions against various diseases and harmful insects. Fitovak immunostimulant protects plants from stressful situations in adverse weather conditions, fungal, viral, bacterial diseases and small sucking and gnawing pests. Fitovak is environmentally friendly and can be used in fields where biolaboratory products are used.

### Results And Discussion

In the 70x15-2 planting scheme, in the control variant, the head circumference of one root-fruit was 35.6 cm, the neck circumference was 30.8 cm, and the total length was 31.7 cm. When Fitavak (standard) was applied at 300 ml/ha, it was higher than the control, and the head circumference of one rhizome was 39.9 cm, the neck circumference was 39.6 cm, and the total length was 37.9 cm compared to the control, the head circumference was 4.3 cm, the neck circumference was 8.8 cm, and the total length was 6.2 cm larger and longer.

In the variant used Tandem-300 ml/ha, the indicators were higher compared to the control, the head circumference of one root fruit was 45.4 cm, the neck circumference was 41.44 cm, and the total length was 41.60 cm. Compared to the control, the above indicators differed as follows: 9.8, 10.6, 9.9

Increasing the application rate of Tandem biostimulant to 400 ml/ha increased the neck and total length of the rhizome relatively less, but did not have a positive effect on the growth of the root head, on the contrary, the biostimulant rate of 300 ml/ha was low. It was 1.7 cm smaller than the used version. Of course, compared to the control option, the indicators remained high in the options where biostimulants were used.

In the 70x15-2 planting scheme, the average weight of one root fruit is heavier by 1411.6 grams compared to the control and by 36.6-63.5 grams compared to the other options.

In the 70x20-2 planting scheme, in the control variant, the head circumference of one root fruit was 28.06 cm, the neck circumference was 39.25 cm, and the total length was 25.73 cm. When Fitavak (etalon) 300 ml/ha was used, the head circumference was 14.3 cm, the neck circumference was 1.2 cm, and the total length was 6.1 cm larger than the control. Increasing the rate of Tandem biostimulant from 300 ml to 400 ml/ha led to the fullness of the root fruit head, but the neck circumference and total length of the root-fruit were the same as the seventh option with 300 ml per hectare.

In the planting pattern 70x25-2, the indicators of one rhizome and leaf were higher than the control when Fitavak (Etolon) was applied at 300 ml/ha. In each option, the head circumference of one rhizome was 5.8 cm, the neck circumference was 5.8 cm, and the total length was 4.0 cm. organized. In the Tandem-400 ml/ha variant, the indicators were higher than the control, the head circumference of one root fruit was 7.9 cm, the neck circumference was 14.3 cm, and the total length was 16.5 cm

**Table 1**

**Effect of sowing scheme and different norms of biostimulators on root-fruit and leaf yield of fodder beet variety "Uzbekistan-83"**

No	Sowing schemes	Biostimulant norms	Biostimulants norms	One in the rhizome					
				Head circumference, cm	neck circumference, cm	General length, cm	One root fruit weight, gr	Number of leaf, pcs	Leaf weight, gr
1	70x15	Control	-	35,6	30,8	31,7	2571,7	37,3	249,5
2		Fitovak (etalon)	300 ml	39,9	39,6	37,9	3141,3	56,9	379,5
3		Tandem	300 ml	45,4	41,4	41,6	3919,8	72,2	481,0

4	70x20	Tandem	400 ml	43,7	41,6	41,7	3983,3	72,8	485,3
5		Tandem	500 ml	39,3	42,4	39,9	3946,7	66,3	441,6
6		Control	-	28,1	39,3	25,7	2968,1	48,2	321,7
7		Fitovak (etalon)	300 ml	42,4	40,5	31,8	4155,0	56,7	377,9
8		Tandem	300 ml	39,9	43,7	42,6	4095,1	67,3	448,60
9	70x25	Tandem	400 ml	46,2	43,1	42,4	4232,0	73,6	490,4
10		Tandem	500 ml	38,7	38,3	31,7	3715,9	57,1	380,3
11		Control	-	31,4	28,1	23,4	3169,0	49,6	330,7
12		Fitovak (etalon)	300 ml	37,2	33,9	27,4	3712,0	55,8	371,7
13		Tandem	300 ml	38,9	34,87	36,8	4080,3	63,6	424,2
14	70x25	Tandem	400 ml	41,0	42,4	39,9	4088,4	64,2	427,7
15		Tandem	500 ml	39,3	36,6	29,7	3934,1	63,4	419,8

In the 70x15-2 planting scheme, the average weight of one rhizome in the control variant was 2571.67 g, and the number of leaves was 37.3. It was observed that the application of biostimulant has a positive effect on the weight gain of the root fruit. When Fitavak (etalon) was applied at 300 ml/ha, compared to the control, the weight of the root fruit was 569.6 grams, and the number of leaves was 19.6 more. In the variant used Tandem-400 ml/ha, the indicators were higher compared to the standard biostimulant, the weight of one root fruit was heavier by 842.0 grams and the number of leaves increased by 15.9 pieces.

The weight of the root fruits in the 70x20-2 planting scheme is 1186.9 grams heavier when Fitavak (etalon) 300 ml/ha is used compared to the control, and the number of leaves is 8.5 more than the standard biostimulant Tandem-400 ml/ha. It was observed that in the version used in the norm, 77.0 grams and the number of leaves are more than 16.9 pieces. Increasing the application rate of Tandem biostimulant to 500 ml/ha did not lead to an increase in the weight of root fruits and the number of leaves.

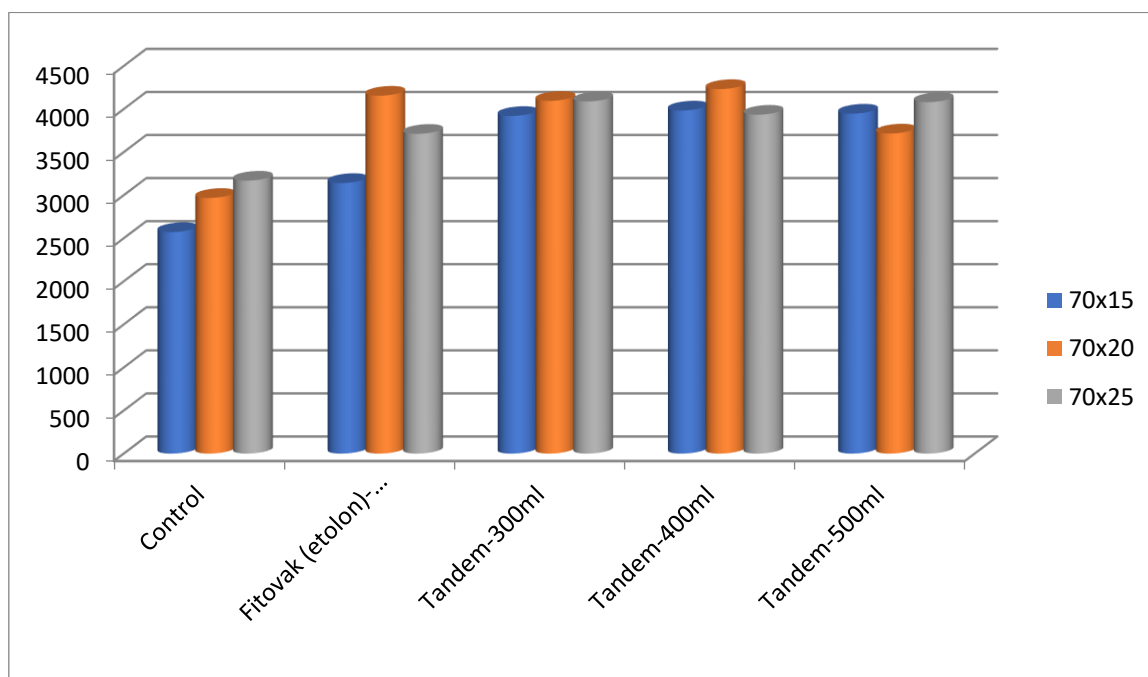


Figure 1. Weight of root-fruit of fodder beet, grams

In the 70x25-2 planting scheme, the above rule was repeated, and in the case of Fitavak (etalon) 300 ml/ha, compared to the control version, it was found that the root weight and the number of leaves per root were

more. In the variant used in Tandem-400 ml/ha, compared to the standard, it was proved that the rhizome was 376.4 grams heavier and the number of leaves was 8.4 more.

### Conclusion

The largeness of the beetroot root, its weight and the formation of leaves in one root-fruit, from planting schemes 70x20-2 scheme and biostimulators Tandem-400 ml/t rate, seed treatment and application of 400 ml/ha during the growing season have a positive result has been achieved. It was determined that Fitovak (etolon) biostimulant shows a high rate when used for seed treatment at the rate of 300 ml/t and 300 ml/ha during the growing season.

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