



**THE INFLUENCE OF SOWING SCHEMES AND RATES OF  
BIOSTIMULATORS ON THE BIOMETRIC INDICATORS OF FODDER  
ROOT BEET VARIETY “UZBEKISTAN-83”**

**Yuldasheva Zulfiya Kamalovna - Professor of Tashkent State Agrarian  
university, E-mail: [zkamalovna@mail.ru](mailto:zkamalovna@mail.ru), ORCID: [orcid.org/0000-0002-4980-8153](https://orcid.org/0000-0002-4980-8153)**

**Mamatdurdiev Ulugbek Firnafas ugli - Intern teacher at Urgench State University  
named after Abu Raykhan Beruni: Head of the Department of Agricultural  
Engineering and Plant Protection of the LCRI Khorezm SRS, E-mail:  
[mamatdurdiyevulugbek@gmail.com](mailto:mamatdurdiyevulugbek@gmail.com), [orcid.org/0009-0004-2455-0485](https://orcid.org/0009-0004-2455-0485)**

**Abstract:** This article studies the effect of sowing schemes and biostimulant rates on biometric indicators of root-fruits of the Uzbek-83 variety of fodder beet. In the experiment, three sowing schemes of 70x15, 70x20, 70x25 were used, and the Tandem biostimulant was applied in three different rates, before sowing, seed treatment and foliar feeding twice during the growing season. The Fitovak biostimulant was used as a standard for this biostimulant. It was observed that the variant using the Tandem biostimulant in the rate of 0.4 + 0.7 + 0.9 was better.

**Keywords:** Fodder beet, variety, root fruit, biostimulant, rate, sowing scheme

**Introduction.** Fodder beet (*Beta vulgaris*) is a biennial root fruit of the Chenopodiaceae family (Paciulli et al., 2016). [1]. The variety of fodder beet "Kiev Rozovaya" is a light pink variety with cylindrical-oval fruits. The tubers weigh about 2 kg. The crop is resistant to diseases and frost. [2]. Fodder beet (*Beta vulgaris* L. subsp. *vulgaris* var. *crassa*) is a biennial plant. In its first year, it produces a root fruit weighing an average of 1.5 to 2.6 kg and a large rosette of leaves. [3].

The shape of the fodder beet tubers can be sac-shaped or oval, cylindrical or spherical; the nutrient-rich root fruit weighs an average of 0.5–2.5 kg; [4].

Regulation of the hormonal status of beet during the ontogenesis period through the use of biologically active growth regulators is an effective means of increasing the productivity and stability of agricultural crops, as well as the quality of products, allowing for increased physiological processes in plants and increased yield [5].



**Research methods.** Field experiments for scientific research were conducted at the experimental farm of Tashkent State Agrarian University during 2023. Field experiments were conducted in 4 replicates, with 15 variants, 60 plots, and a total area of 0.20 ha. The variants were placed in a randomized method.

**Research results.** Biometric indicators of the root fruit of the Uzbekisont-83 variety of fodder beet were studied according to sowing schemes and biostimulant standards (see Table 1).

All root fruits belong to the group of geophytes, in which root fruits develop, consisting of an epicotyl (head), hypocotyl (neck) and a main root. The root fruit of fodder beet is divided into three main parts: 1. The root fruit is the uppermost part of the root fruit, where the leaves and buds are located and is located above the ground and is the part with the least sugar content, but with a lot of mineral salts. 2. The root neck is the part between the head and the true root. Morphologically, it is formed from the hypocotyl of the cotyledon. It does not have leaves or lateral roots. 3. The true root: the lowest, conical part, located underground. It is in this part that the sugar content is highest and there are ridges from which the roots emerge [6].

The weight of one root fruit in the control variant in the 70x15-1 sowing scheme was found to be 1271.8 grams on average, with a root fruit circumference of 32.6 cm. and a root fruit length of 21.9 cm. In the variant in which the Phytovak 20% immunostimulant was used as a standard, it was found to be 1306.7 grams, with a root fruit length of 23.4 cm. and a root fruit circumference of 34.2 cm, which resulted in the formation of larger root fruits compared to the control.

In the variant where Tandem 10% biostimulant was applied at a rate of 0.4+0.7+0.9 l/ha, the root weight was 1491.6 grams, the root length was 27.8 cm, and the root neck circumference was 37.2 cm. Compared to the low-rate and high-rate variants, the root weight was 101.0 grams and 74.2 grams heavier, 2.5 and 0.9 cm longer, and the neck circumference was 4.1 and 1.4 cm larger. In this variant, it was 219.8 grams heavier, 5.9 cm longer, and 9.3 cm larger than the control variant, and 184.9 grams heavier, 4.4 cm longer, and 6.6 cm larger than the reference variant.

In the 70x20-1 sowing scheme, the weight of one root fruit in the standard variant was 2066.3 grams, the root fruit length was 25.1 cm, and the root fruit neck circumference was 38.2 cm. Compared to the control variant, the root fruit was 32.0 grams heavier, 1.5 cm longer, and 2.3 cm larger.

In the variant where Tandem 10% biostimulant was applied at a rate of 0.4+0.7+0.9 l/ha, the root weight was 2182.7 grams, the root length was 31.5 cm, and the root neck circumference was 44.2 cm. Compared to the low-rate variant and the high-rate variant, it was 103.6 grams and 82.0 grams heavier, 3.7 and 1.6 cm longer, and the neck circumference was 3.4 and 0.8 cm larger. In this variant, it was 148.4 grams heavier, 7.9 cm longer, and 8.3 cm larger than the control variant, and 116.4 grams heavier, 6.4 cm longer, and 6.0 cm larger than the reference variant.

**Table 1**

**Biometric indicators of fodder beet root fruit, 2023**

No	Sowing	Name of biostimulators	Rates of biostimulators, l/t, l/ha	Weight of one root fruit, gramm	1 ta ildizmevada				
					head circumference, cm	neck circumference, cm	Width of root fruit, cm	Root fruit length, cm	Main root length, cm
1	70X15-1	Control	-	1271.8	27.9	32.6	9.6	21.9	13.7
2		Fitovak 20% (standard)	0.3+0.3+0.4	1306.7	30.6	34.2	10.5	23.4	16.5
3		Tandem 10%	0.3+0.5+0.7	1390.6	33.1	35.3	11.2	25.3	17.2
4		Tandem 10%	0.4+0.7+0.9	1491.6	37.2	39.8	12.5	27.8	19.1
5		Tandem 10%	0.5+0.9+1.0	1417.4	35.8	38.2	11.9	26.9	18.4
6	70X20-1	Control	-	2034.3	31.2	35.9	11.6	23.6	16.2
7		Fitovak 20% (standard)	0.3+0.3+0.4	2066.3	33.5	38.2	12.4	25.1	17.5
8		Tandem 10%	0.3+0.5+0.7	2079.1	36.0	40.8	13.1	27.8	18.8
9		Tandem 10%	0.4+0.7+0.9	2182.7	39.5	44.2	15.2	31.5	20.7
10		Tandem 10%	0.5+0.9+1.0	2100.7	38.2	43.4	14.4	29.9	19.2
11	70X25-	Control	-	2060.7	34.0	37.4	12.1	26.3	16.9
12		Fitovak 20% (standard)	0.3+0.3+0.4	2104.2	36.4	39.8	12.9	29.9	18.4

13	Tandem 10%	0.3+0.5+0 .7	2172.7	38.2	41.4	13.7	31.2	19.3
14	Tandem 10%	0.4+0.7+0 .9	2359.4	41.2	45.0	15.7	34.8	22.1
15	Tandem 10%	0.5+0.9+1 .0	2270.9	40.8	43.9	14.9	33.6	20.3

In the 70x25-1 sowing scheme, the weight of one root fruit in the standard variant was 2104.2 grams, the root fruit length was 29.9 cm, and the root fruit neck circumference was 39.8 cm. Compared to the control variant, the root fruit was 43.5 grams heavier, 3.6 cm longer, and 2.4 cm larger.

In the variant where Tandem 10% biostimulant was applied at a rate of 0.4+0.7+0.9 l/ha, the root weight was 2359.4 grams, the root length was 34.8 cm, and the root neck circumference was 45.0 cm. Compared to the low-rate and high-rate variants, the root weight was 186.7 grams and 88.5 grams heavier, 3.6 and 1.2 cm longer, and the neck circumference was 3.6 and 1.1 cm larger. In this variant, it was 298.7 grams heavier, 8.5 cm longer, and 7.6 cm larger than the control variant, and 255.2 grams heavier, 4.9 cm longer, and 5.2 cm larger than the reference variant.

In the 70x25-1 sowing scheme, in which the Tandem 10% biostimulant was applied at a rate of 0.4+0.7+0.9 l/ha, the plant's nutritional area was larger than in the 70x15-1 and 70x20-1 sowing schemes, and the weight of one root fruit was found to be 867.8 and 176.7 grams heavier, 7.0 and 3.7 cm longer, and 5.2 and 0.8 cm larger in neck circumference.

**Conclusion.** Sowing the Uzbek-83 variety of fodder beet in a 70x25-1 scheme and applying the Tandem 10% biostimulant at a rate of 0.4+0.7+0.9 l/ha during seed treatment and the growing season ensures that the root fruit is heavy, long, and large.

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