International Journal of
Biological Engineering and Agriculture

ISSN: 2833-5376
Volume 2 | No 2 | February -2023

Effect of Mineral Fertilizers Norms on Wet and Dry Mass Collection of Stevia

Rahimov Avazbek Holmamatovich [1], Ulugboev Ahmadjon Yokubjonovich [2]

[1] Doctor of Agricultural Sciences, Scientific Research Institute of Seed Production and Cultivation Agrotechnologies of Cotton Breeding

[2] Independent researcher of Scientific Research Institute of Seed Production and Cultivation Agrotechnologies of Cotton Breeding

Abstract: In this article, data are given about the effect of mineral fertilizer rates on the wet and dry mass of a single stevia plant. Accordingly, the biological green mass of a single plant averaged 90.3–133.5 grams per variant. The lowest rate was noted in the plant of control variant at 90.3 g/ha, and the highest rate was noted in the variant with 133.5 g/plant phosphorus fertilizers applied at the high 175 kg/ha norm.

Keywords: Mineral fertilizers, norm, wet mass, dry mass, stevia.

Introduction

There is a great demand in the world today for the use of natural plant sources that give a sweet taste and do not harm human health. In the developed countrie s of Europe, 6-7% stevioside sweet substance of stevia leaf has been widely used for several years in the preparation of confectionery products, various beverages, canned goods and as a medicine. Stevia extract is about 30 times sweeter than sugar cane and saccharose, but 1/300 of it has a caloric value. Due to the high content of beneficial elements in the aqueous solution of stevia extract, it is widely used in food and medicine.

Literature review

Stevia rebaudiana Bertoni is a perennial herb of the Aste raceae family. The plant is native to Paraguay and has been used by locals for more than 1,500 years. Adapted to the tropical region of South America, the leaves of this plant contain 6 -7% stevioside. It is 25-30 times sweeter than the sugar consumed, though low in calories, has no power supply [4; B. B. 4-5], [1; B. B. 2-23], [3; B. B. 147], [2; B. B. 156-157], [5; B. B. 888-892], [6; B. B. 379], [7; B. B. 56-60] [8; B. B. 133-140].

Currently, more than 15 developed countries (USA, UK, France, Japan, China, South Korea, Canada, Russia, Ukraine and other developed countries) have produced and bred S. rebaudiana to include confectionery, sweet drinks, diet foods, canned goods and medicines are widely used in extent [5; B. B. 888 -892], [7; 56-60], [9; B. B. 37-39], [10; B. B. 14].

Materials and Methods

The experiment was conducted in Uychi district of Namangan region. The experimental field consists of light-colored gray sierozem soils, moderately sandy with a mechanical composition, irrigated from time immemorial, not saline. Field experiments were conducted according to B.A.Dospekhov's (1982) "Methods of conducting field experiments". All phenological observations were made in the calculated areas of each variant, in isolated plants. Leaf level of stevia plan t and

total leaf area per hec tare are determined by the method of A.A.Nichiparovich, biological productivity is determined by the method of I.S.Shatilov, M.K.Kayumov.

Results and Discussion

The stevia plant is grown for its leaves. The leaves of the stevia plant contain a substance called stevioside, which has a very high level of sweetness, and many valuable minerals. As a result, in recent years, attention to the stevioside plant has been increasing in most countries.

Also, in our country, the attention to the stevia crop is increasing, and a number of scientific studies have been conducted in this regard. However, scientific research on stevia cultivation under irrigated conditions is insufficient and no clear recommendations have been developed. Therefore, the effect of mineral nutrition on the leaf yield of stevia plant in the conditions of irrigated light sierozem gray soil was studied in the experiment. Data on the effect of mineral nutrition on the mass of a single plant are given in Table 1.

According to the table above, in mineral nutrition, the productivity of a stevia crop depends on the grade of adequate supply of mineral nutrients to the plant during the season. In the experiment, it was observed that in the variants where all mineral fertilizers were applied, the productivity of the plant was higher than in the control variant without mineral fertilizers.

Table 1. Effect of mineral fertilizers norms on mass of single plant

№	Options	Average mass of single plant	Dry mass, gr/plant	
			Total	Leaf
1	Control	90,3	32,3	8,1
2	$N_{50}\,P_{175}\,K_{50}$	133,5	43,8	11,2
3	$N_{50}\,P_{150}\,K_{50}$	121,3	38,0	10,1
4	$N_{50}\,K_{50}$	108,5	35,2	9,3

The biological mass of one plant was 90.3 -133.5 grams according to the options. The lowest number was noted in the 90.3 g/plant control variant, and the highest number was noted in the variant applied at the high rate of 133.5 g/plant phosphorus fertilizers, i.e. 175 kg / ha.

In the experiment, no phosphorus fertilizers were used, only nitrogen and potassium fertilizers were used, the plant mass per plant was 108.5 g/plant, and the difference compared to the control option was 18.2 g/plant. In the experiment, it was observed that the mass of one plant increased to 18.2 - 40.5 grams due to mineral nutrition.

In addition to the biological mass of the plant, the study of the dry mass is of great scientific and pract ical importance. Therefore, the positive effect of agrotechnical measures, including mineral nutr ition, on the formation of dry mass of stevia plant was studied in the experiment.

The dry biological mass of one stevia plant was in the range of 32.3-43.8 grams according to the options. The lowest number by dry mass was 32.3 g/plant, which was obser ved in the control variant without the use of mineral fertilizers. The highest rate was 43.8 g/ha, observed under the conditions of application of mineral fertilizers $N_{50}\,P_{175}\,K_{50}$ kg/ha. The dry leaf mass was 8.1–11.2 g/plant per variant. The lowest number was 8.1 g/plant, noted in the control variant, only 9.3 g / plant under conditions of application of nitrogen and potassium fertilizers $N_{50}\,K_{50}$ norm. Under the conditions of application of mineral fertilizers $N_{50}\,P_{150}\,K_{50}$ norm, the dry leaf mass was 10.1 g/plant. A relatively high rate of dry leaf mass was observed under conditions of normal application of 11.2 g/plant mineral fertilizers $N_{50}\,P_{175}\,K_{50}$ kg/ha.

Therefore, in order to increase the productivity of stevia plant under irrigated conditions, it is recommended to fully meet the plant's need for mineral nutrients, including phosphorus fertilizers, during the season.

Conclusion

The biological green mass of one plant averaged 90.3–133.5 grams per variant. The lowest rate was noted in the plant control variant at 90.3 g/ha, and the highest rate was noted in the variant with 133.5 g/plant phosphorus fertilizers applied at the high 175 kg / ha norm.

References

1. Abduraxmanova A. Technology of stevia cultivation in Syrdarya conditions. Bulletin of Gulistan State University. 2018. –P.23.
2. Baykabilov B., Belolipov I. Cultivation of stevia (Stevia rebaudiana Bertoni (Hemsl) from seeds in the south of Uzbekistan // Biology - science of the XXI century: Proceedings of the Pushchino school-conf. of young scientists. - Pushchino, 2003.–P 156-157.
3. Belolipov I.V. Introduction of herbaceous plants of the natural flora of Central Asia. Tashkent, ed. "FAN" 1989, -P 147.
4. Belolipov I.V., Allayorov X., Raximov I., Boyqobilov B. Basic agronomic techniques of growing stevia from seed. Tash DAU Publishing and Editing Department, Tashkent - 2002. –P 4-5.
5. Bondarev N.I. Influence of exogenous growth regulators on callusogenesis and growth of cultivated Stevia rebaudiana cells // Plant Physiology. - Moscow, 1998. - No. 6 (3). –P 888-892.
6. Bondarev N.I. Composition and content of steviol-glycosides in aboveground and underground organs of Stevia rebaudiana Bertoni and their dynamics during ontogenesis report International scientific confe rence. - Penza, 2003. -P 379.
7. Dospexov B.A. Methods of field experiments /-M., Agroproizdat 1985.-P 56-60.
8. Duseynov T.K. and Kim Yu.M. "Cultivation of stevia in Uzbekistan" V. collection of problems of storage and use of genetic resources of agriculture crops for breeding work. T.-1995. –P 133-140.
9. Duseynov T.K., Kim Yu.M., Rustamova A.S. Propagation of stevia plant by cuttings. Bulletin of Agrarian Science of Uzbekistan, 2001. №1 – P 37-39.
10. Ermolaeva G.A., Sapronova L.A. Sugar and sugary products in the beverage industry. M., 2012.–P