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INFLUENCE OF "FITOBIOSOL" MICROBIOLOGICAL DRUG ON GROWTH, YIELD AND QUALITY OF BROCCOLI

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Abstract
In this article, the parameters of the microbiological drug "Fitobiosol" are given with a deep scientific analysis of the results of the research carried out in order to study the effect of the microbiological drug "Fitobiosol" on the growth, yield and quality of broccoli (Brassica oleracea var.italika). Also, the effect of the drug "Fitobiosol" on the fruit composition of broccoli cabbage is recorded in the article.

Keywords: varieties, fertilizing, nutrients, organic substances, fitobiosol preparation.

Introduction

Broccoli (Brassica oleracea L. var. italica Plenck 2n=x=18) is a vegetable crop belonging to the Brassicaceae or Cruciferae family, originating from the Mediterranean region and known as "Khari gobhi" in Hindi. In Jordan, broccoli is grown in protected areas. However, more than half of the world's population does not benefit from this agricultural technology, because they do not have a specific gene (GSTMI) that helps to retain the compound in the body.

Growing broccoli in newly reclaimed soils presents various challenges, such as cultivars, fertilization, low availability of nutrients and organic matter, as well as poor hydrophilic, chemical and biological properties. Nkoa et al (2002) found that application of mineral fertilizers (N, P, K) increased vegetative growth, yield and quality of broccoli.

Organic fertilizer plays an important role in the process of mineralization and improving the physico-chemical properties of the soil as a source of all necessary macro and microelements, directly participating in the growth of plants. Anant-Bahodur et al (2006) noted that organic matter plays an important role in the chemical behavior of several metals in soil.

However, due to the increasing demand for broccoli sprouts every year, the trend of cultivation by farmers is spreading widely around the world. Broccoli is an important vegetable crop and has high nutritional and good commercial value. It is a low-sodium food, low in fat and calories, high in vitamins C, A, B_2 and calcium. At present, broccoli is attracting more attention among vegetable crops due to its various uses and high nutritional value. Usually, excessive amounts of inorganic fertilizers are applied to vegetables to achieve high yields and maximum growth rates.

However, using only inorganic fertilizers can cause problems for human health and the environment. Thus, inorganic fertilizers are the main source of plant nutrients, but they have harmful effects on human health. Microbiological preparations can serve as an alternative practice to mineral fertilizers for soil structure and microbial improvement, as well as ensure normal physiological processes in plants.

The use of microbiological preparations improves soil structure, aeration, water holding capacity and microbial activity. Soil fertility is decreasing as a result of highly intensive assimilation of nutrients by crops and deterioration of microbiological processes in the soil. The use of microbiological preparations leads to an increase in the yield of broccoli along with the improvement of the soil structure.

Materials and Methods

Research on determining the effect of microbiological drug "Fitobiosol" on the growth, yield and quality of broccoli (Brassica oleracea var. italica) was conducted at the experimental site of the Department of Fruit, Vegetable and Viticulture of Tashkent State Agrarian University in 2021-2022. The experiment was carried out by spraying solutions in 4 variants and 4 repetitions. Research options include: water; 1% solution of fitobiosol preparation; 2% solution of fitobiosol preparation, 3% solution of fitobiosol preparation.

Researches in field and laboratory conditions "Guidelines for the ecological testing of vegetable crops in the open field", "Guidelines for the selection of green, spicy-tasting and perennial crops", "Guidelines for the study of the collection of cabbage and leafy green crops (lettuce, spinach, dill)", "Methodology of the State variety testing of agricultural crops", "Methodology of experimental work in vegetable growing and melon growing" was conducted on the basis of

methodological manuals.The statistical analysis of the data was carried out using the Microsoft Excel program based on the dispersion method (B.A. Dospekhov). Observations were recorded on more than 10 signs of growth, yield and quality of broccoli, that is, plant height, number of leaves per plant, leaf length, leaf width, yield characteristics, yield, head diameter, vitamin C, total sugar content were studied.

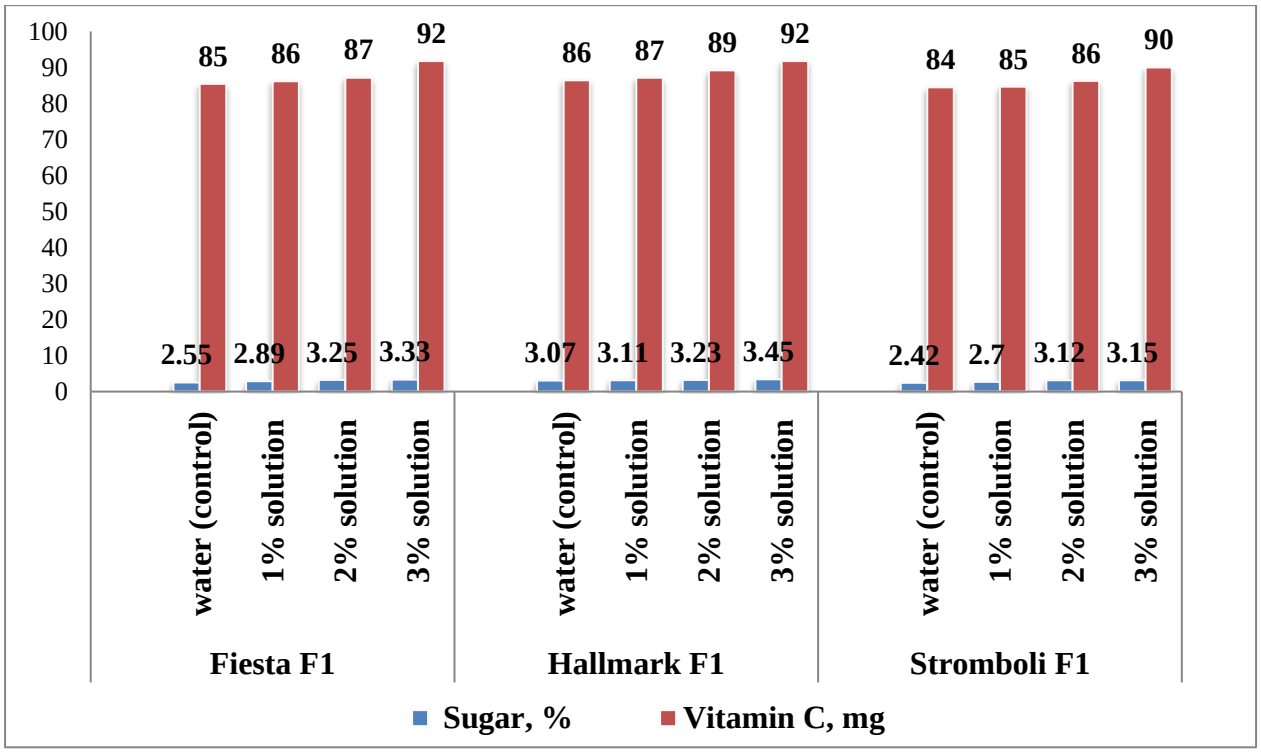
Results and Discussion

In our experiments, we observed that during the growth process of the broccoli hybrid "Fiesta F1" when treated by spraying water, the average diameter of the central heads was 145.34 mm, the diameter of the heads of "Hallmark F1" and "Stromboli F1" hybrids was respectively 147.60 - 145.34 mm. When treated with a 1% solution of the drug "Fitobiosol", the diameter of the heads was 154.00 mm in the hybrid "Fiesta F1", 156.65 - 154.00 mm in the hybrids "Hallmark F1" and "Stromboli F1", respectively, when treated with a 2% solution of the drug, the diameter of the heads in the hybrid "Fiesta F1" The diameter was 165.75 mm, 167.95-165.75 mm in "Hallmark F1" and "Stromboli F1" hybrids, and 168.14-166.15 mm in 3% solution.

An increase in the size of the vegetative organs of the plant was observed with the increase in the concentration of the solution, but it had almost no effect on the head diameter and yield of the plant (Table 1).

Table 1 Effect of the drug "Fitobiosol" on the growth and development and productivity of broccoli (2020-2021)

№	Options	Signs					
		Plant height (cm)	Number of leaves, pcs	Leaf length (cm)	The width of the leaf	Yield (ts/ha)	Head diameter (mm)
Fiesta F₁							
1.	**water (control)**	47.83	17.61	41.52	19.20	257.71	145.34
2.	**1% solution of fitobiosol**	49.69	18.86	45.52	22.97	310.03	154.00
3.	**2% solution of fitobiosol**	52.75	19.85	46.31	22.30	326.69	165.75
4.	**3% solution of fitobiosol**	53.42	19.73	46.56	22.40	326.85	165.8
Hallmark F₁							
5.	**water (control)**	48.40	17.92	41.86	19.70	258.50	147.60
6.	**1% solution of fitobiosol**	52.81	19.25	45.78	23.13	315.56	156.65
7.	**2% solution of fitobiosol**	56.94	20.41	46.58	22.75	328.21	167.95
8.	**3% solution of fitobiosol**	60.12	20.95	46.92	22.84	329.14	168.14
Stromboli F₁							
9.	**water (control)**	45.11	16.85	39.52	18.20	235.71	145.34
10.	**1% solution of fitobiosol**	47.52	17.40	42.58	20.14	240.98	154.00
11.	**2% solution of fitobiosol**	50.71	18.12	43.68	21.23	280.53	165.75
12.	**3% solution of fitobiosol**	51.48	18.78	44.45	21.36	282.65	166.15



Graph 1: Effect of "Fitobiosol" drug on the fruit composition of broccoli.

An increase in yield was observed with increasing concentration. When treated with a 1% solution of the drug "Fitobiosol", the yield was 310 t/ha in the "Fiesta F1" hybrid, 315-240 t/ha in the "Hallmark F1" and "Stromboli F1" hybrids, respectively, when treated with a 2% solution of the drug, "Fiesta F1 " hybrid made 326 ts/ha, "Hallmark F1" and "Stromboli F1 hybrids 328-280 ts/ha, respectively, and 3% solution 329-282 ts/ha.

The results of the research show that with the increase of the mixture coefficient of the "Fitobiosol" preparation, a different change was observed in the composition of the fruit (Graph 1).

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