European Journal of Agricultural and Rural Education (EJARE)
Available Online at: https://www.scholarzest.com
Vol. 4 No. 01, January 2023
ISSN: 2660-5643

THE EFFECT OF THE "MICROO'STIRGICH" BIOPREPARATION ON THE BIOMETRIC INDICATORS OF PEANUT VARIETIES IN THE SOIL AND CLIMATE CONDITIONS OF TASHKENT REGION

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Article history:

Received: 10th November 2022
Accepted: 11th December 2022
Published: 24th January 2023

Abstract:

This article presents data on the effect of Mikroo'stirgich biopreparation on peanut varieties at different rates on its biometric indicators. According to it, it was found that increasing the rate of application of Mikroo'stirgich preparations to peanut varieties increases the quantitative indicators of all yield elements. When peanut varieties were exposed to the biopreparation at different rates, it was found that the best result was obtained from the 10 liter/ha norm in all varieties, and the relatively high result was obtained from the "Leader" variety.

Keywords: "Leader", "Tashkent-112", "Qibray-4", peanuts, varieties, biopreparation, Mikroo'stirgich, norm, foliar application, kernel output, thousand grain weight.

INTRODUCTION

Peanut (Chinese peanut) is a valuable oil and food plant. As of January 2023, the gross peanut crop grown in the countries of the world is 50.2 million/tons. Countries that grow the largest amount of peanuts, including the People's Republic of China - 18.3 million/tons of harvest, i.e. 36% of the gross harvest, 6.6 million in India/tons (13.0%), in Nigeria - 4.5 million. tons (9.0%), in the USA and Sudan - 2.5 million. tons (from 5.0%), in Senegal and Burma - 1.7 mln. tons (from 3.0%), in Argentina -1.3 mln. tons (2%), 1.2 and 1.1 million in Guinea and Tanzania. more than tons (2.0%) were grown [2; 8; 12].

Peanut seeds contain 48-50% easily digestible oil, from which delicious peanut oil is produced in the industry. Peanut oil is not inferior to olive oil in terms of taste. Peanut oil is widely used in the preparation of high-quality preserves and margarine from various vegetable crops, in the confectionery and perfume industry. In the field of confectionery alone, peanuts are the main raw material in the production of more than 60 products, including edible oil, chocolates, cookies, coffee, candy, ice creams and other products. In addition to oil, peanut kernels contain 26-28% high-quality easily digestible protein, minerals and vitamins [2; 3; 6; 10].

According to the preliminary data of the State Statistics Committee, the value of Uzbekistan in January-November 2022 is 1.0 billion, 1.6 million US dollars. exported tons of fruits and vegetables. This indicator has increased by 168.3 thousand tons compared to the same period last year. The volume of exported fruits and vegetables in 11 months of 2022: fruits and berries - 335 thousand tons, dried fruits and berries - 42 thousand tons, vegetables - 819 thousand tons, onions - 199.5 thousand tons, cabbage - 142 thousand tons, tomatoes - 71 thousand tons, grapes - 218 thousand tons, raisins - 73.6 thousand tons, peanuts - 18.3 thousand tons, watermelon-melon - 135.8 thousand tons [1].

LITERATURE REVIEW

Gypsum is the most common calcium source for improving peanut production in the southeastern United States. Gypsum application increases the yield of peanuts and improves seed quality.

Studies in Florida have shown that Gypsum applied at the rate of 0.5 tons per 1 acre (0.4 ha) significantly increased peanut seed yield and value and calcium concentration [7].

According to the results of the experiment conducted at the Egyptian National Research Center, the use of organic fertilizers and biopreparations in the cultivation of peanuts had a positive effect on the yield of peanuts. In particular, it was determined that plant height, root, number of nuts and total yield were higher in the option where biopreparation was used than in the options where only mineral fertilizers were used [9].

According to G. Ganapathy-selvam and K. Sivakumar foliar spray of 2% concentration of Hypnea musciformis (Rhodophyta) seaweed liquid fertilizer (SLF) on peanut growth and development and increases the yield to a high level [5].

The stem height, yield and biomass of peanuts directly depend on the planting period and external environmental factors. When the seeds are sown early and in an optimal period, it allows sufficient use of temperature during vegetative development and increases productivity [4].

METHODS AND MATERIALS

Scientific research work was carried out at the Agricultural Scientific Research and Educational Experimental Farm of Tashkent State Agrarian University. The experimental farm is located in the upper reaches of the Chirchik River, at an altitude of 481 m above sea level, at $41^{0}11^{II}$ north latitude and $38^{0}31^{II}$ east distance, in Kibray district of Tashkent region.

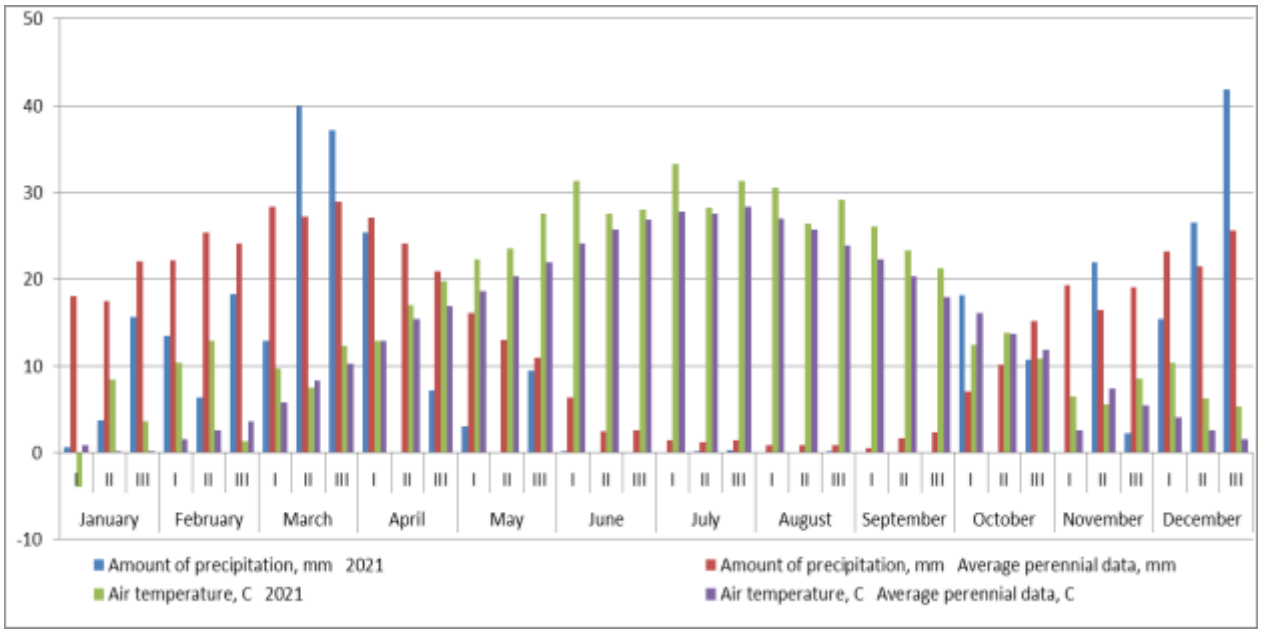

Figure 1. Air temperature and precipitation in 2021

The soil of the experimental farm is a typical sierozem soil that has been irrigated since ancient times. This soil contains about 0.8-1.0% humus, about 0.058-0.089% nitrogen, about 0.141-0.184% phosphorus and about 0.154-0.148% potassium. The soil is not saline. This soil differs in water permeability and the complexity of softening. If mineral and organic fertilizers are used, it is possible to grow a high yield of field crops. Groundwater is located at a depth of 15-18 m. For irrigation, water from the "Bo`z-suv" channel flowing from the northern part of the experimental farm was used.

Methods of conducting field experiments. Field experiments were conducted in the conditions of typical sierozem soils of the agricultural scientific research and educational experimental farm of Tashkent State Agrarian University (2019-2021). In this article only the analysis of data obtained in field experiments in 2021 is presented.

Conducting field and laboratory experiments, sowing, phenological observations, biometric measurements, crop cultivation, yield determination researches B.A.Dospehov's (1985) "Method of field experiments", UzPITI's "Methods of conducting field experiments" (Tashkent , 2007), M.Amanova's "Methodological manual for the study of samples of the world collection of oilseed crops" (Tashkent, 2005) and "Methodological manuals for the study of morphological characters of the peanut crop (Tashkent- 2011) based on.

In the experiment, the following phenological observations, calculations, and laboratory analyzes were carried out on the peanut crop:

- in laboratory conditions of peanut plant, seed germination was determined in 6 days and germination in 10 days at a constant temperature of +25 ^{0} C.
- the degree of seed germination was observed in all variants of experimental repetitions;
- the number of sprouted grasses, seedling thickness was determined at 3 points of all options;
- phenological observations (periods of germination, branching, flowering, nut formation and ripening) were carried out in plants;
- the effect on yield indicators was determined
- quality indicators of peanut seeds were determined in laboratory conditions;

Composition and properties of the biopreparation "Mikroo`strigich".

"Mikroo`strigich" biopreparation is an environmentally friendly biopreparation created on the basis of an association of promising active local milk-fermenting bacteria. The active milk-fermenting bacteria included in this biopreparation have properties that synthesize gibberellin and indolyl acetic acid, produce antibiotics, and protect plants from phytopathogenic microorganisms.

The biopreparation was tested in Karakalpakstan and Kashkadarya, Surkhandarya, Samarkand, Bukhara and Tashkent regions.

Application: enhances the growth and development of agricultural crops, obtains a high and efficient harvest from them, and protects against various fungal and bacterial diseases.
Based on a promising indigenous association of probiotic bacteria with high antifungal activity, it is environmentally friendly, simple to produce and reduces the consumption of chemical fertilizers by 50-55%.
Biopreparation "Mikroostrigich" is environmentally friendly and non-toxic.
"Mikroo'stirgich" is an environmentally friendly and biologically active biopreparation that increases soil structure and fertility, enriches the soil with useful microflora and activates them.

RESULTS AND DISCUSSION

Before harvesting, the composition of the yield is determined. In field experiments, the peanut crop was harvested when it was ripe, and biometric measurements (number of nuts per plant, amount of ripened nuts, productivity per plant, nuts weight per plant, kernel yield and 1000 grain weight) were carried out, we found differences between varieties (see Table 1).
One of the main factors determining the productivity of the peanut crop is the degree of formation and development of yield elements (number and weight of nuts and grains). It is noted that the number and weight of nuts per plant, the number and weight of grains per nut are one of the important factors in the formation of the yield of this plant. The main elements that determine the yield of the peanut crop are its nuts, the number and weight of grains in the nuts, and the mass of 1000 grains.
The number of nuts on one plant of the Tashkent-112 variety sown in the experiment was 13 pieces, and when the "Mikroo'stirgich" preparation was applied at the rate of 1 liter/ton to one ton of seeds, it was observed that the number of nuts reached 22, and it was found that there were 9 units more than the control option. It was observed that when the preparation of the "Mikroo'stirgich" was increased to 3 l/ha, its number reached 32 pieces, and compared to the control option, it was 19 pieces, and compared to the option with 1 l/t, it was 10 pieces more. When the rate of use of the preparation was increased from 3 liters/ha to 13 liters/ha, it was found that this indicator was 34, 40, 37 units, respectively. It can be seen that the number of nuts per plant increased as the dose of the preparation increased, but the best result was obtained from the variant that used 10 liters/ha.
When the amount of ripe nuts was determined by percentage, it was 69.2 percent in the control variant, and it was found that it increased from 72.7 percent to 85.0 percent when the "Mikroo'stirgich" biopreparation was used. It was also observed that the number of nuts increased, and the best result was obtained from the variant used at 10 liters/ha. When the productivity of one bush was determined, it was 14.78 grams in the control option, and it was increased from 17.35 grams to 20.85 grams in the variants using the biopreparation. In the experiment, the weight of nuts per plant was determined, and in the control option, this indicator was 10.38 grams.

Table 1
Effect of "Mikroo'stirgich" biopreparation on yield elements of local peanut varieties (2021 data)

No	Options	before planting the seed	In flowering period	In podded period	The number of nuts per plant, pcs	amount of matured nuts, %	productivity in one bush plant, g	nuts weight in the one plant, g	Kernel output, %	1000 pcs seed weight, g
"Tashkent-112" variety (control)										
1	Control				13	69.2	14.78	10.38	70.2	372.6
2	Mikroo'stirgich	1 l/t	-	-	22	72.7	17.35	12.86	74.1	388.1
3	Mikroo'stirgich	1 l/t	3 l/ ha	-	32	75.0	18,17	13.57	74.7	392.4
4	Mikroo'stirgich	1 l/t	3 l/ ha	3 l/ ha	34	76.5	19.40	14,20	73.2	394.2
5	Mikroo'stirgich	1 l/t	3 l/ ha	6 l/ ha	40	85.0	20.81	16,15	77.6	395.6
6	Mikroo'stirgich	1 l/t	3 l/ ha	9 l/ ha	37	83.8	20.03	14.71	73.4	396.4
"Leader" variety										
7	Control				16	68.8	19.11	13.72	71.8	850.1
8	Mikroo'stirgich	1 l/t	-	-	30	76.7	24,36	17.95	73.7	865.4
9	Mikroo'stirgich	1 l/t	3 l/ ha	-	31	80.6	23.77	17.62	74.1	868.6
10	Mikroo'stirgich	1 l/t	3 l/ ha	3 l/ ha	42	73.8	27.13	20.51	75.6	871.2
11	Mikroo'stirgich	1 l/t	3 l/ ha	6 l/ ha	49	75.5	27.02	20.99	77.7	874.6
12	Mikroo'stirgich	1 l/t	3 l/ ha	9 l/ ha	49	77.6	26.99	20,27	75.1	876.4
"Qibray-4" variety										
13	Control				19	57.9	18.34	12.75	69.5	755.2
14	Mikroo'stirgich	1 l/t	-	-	29	69.0	21.70	15,21	70.1	768.7
15	Mikroo'stirgich	1 l/t	3 l/ ha	-	37	73.0	23,28	16.65	71.5	770.0
16	Mikroo'stirgich	1 l/t	3 l/ ha	3 l/ ha	42	71.4	24.16	17.59	72.8	771.8
17	Mikroo'stirgich	1 l/t	3 l/ ha	6 l/ ha	46	73.9	24.79	18.32	73.9	772.5
18	Mikroo'stirgich	1 l/t	3 l/ ha	9 l/ ha	47	76.6	26.74	19.66	73.5	774.6

It was observed that when the Mikroo'stirgich biopreparation was used at different rates, it increased from 12.86 grams to 16.15 grams. When the extraction of kernels was determined in the peanut, it was found that the rate of kernel extraction in the control variant was 70.2 percent. When exposed to biopreparations of different norms, the percentage of rate of kernel extraction was observed, and it was found that it increased from 74.1% to 77.6% according to the options. It is known that the weight of 1000 grains is considered as a variety indicator, but it varies depending on the growing conditions. When the weight of 1000 grains was analyzed in the experiment, it was observed that this indicator was 372.6 grams in the control variant, and in the variants affected by the biopreparation, the weight of 1000 grains also increased as the rate of application of the preparation increased (Table 1).

When these biometric measurements were carried out in the "Lider" variety, the number of nuts per plant was 16 in the control variant, and the number of nuts was 30 when the Mikroo'stirgich preparation was applied to one ton of seeds at the rate of 1 liter/ton. It was observed that it reached up to 14 units more than the control variant. It was observed that when the preparation of the Mikroo'stirgich was increased to 3 l/ha, its number reached 31 pieces, and it was 15 pieces more than the control option, and 1 piece more than the option with 1 l/t. When the rate of use of the preparation was increased from 3 liters/ha to 13 liters/ha, it was found that this indicator was 42, 49, 49 units, respectively. It can be seen that the number of nuts per plant increased as the dose of the preparation increased, but the best results were obtained from the variants that used 10 and 13 liters/ha.

When the amount of ripe nuts was determined as a percentage, it was 68.8 percent in the control variant, and it increased from 76.7 percent to 86.0 percent when the Mikroo'stirgich biopreparation was used. It was also observed that the number of nuts increased, and the best result was obtained from the option that used 4 liters/ha. When the productivity of one bush was determined, it was 19.11 grams in the control option, and it was increased from 23.77 grams to 27.13 grams in the variants using the biopreparation. In the experiment, the weight of nuts per plant was determined, and in the control option, this indicator was 13.72 grams. It was observed that when the Mikroo'stirgich biopreparation was used at different rates, it increased from 17.62 grams to 20.99 grams. When the extraction of kernels was determined in the peanut, it was found that the rate of kernel extraction in the control variant was 71.8 percent. When exposed to biopreparations of different norms, the percentage of rate of kernel extraction was observed, and it was found that it increased from 73.7% to 77.7% according to the options. It is known that the weight of 1000 grains is considered as a variety indicator, but it varies depending on the growing conditions. When the weight of 1000 grains was analyzed in the experiment, it was found that in the control variant, this indicator was 850.1 grams, and in the variants affected by the biopreparation, the weight of 1000 grains also increased as the rate of application of the preparation increased, and according to the variants, 865 It was found that it was 4-876.4 grams.

When biometric measurements were carried out in the "Qibray-4" variety, the number of nuts per plant was 19 in the control option, and the number of nuts in the case of exposure to the Mikroo'stirgich preparation at the rate of 1 liter/ton per one ton of seeds, it was observed that it reached 29, and it was found that it was 11 more than the control variant. It was observed that when the preparation of the Mikroo'stirgich was increased to 3 l/ha, its number reached 37 pieces, and compared to the control option, it was 18 pieces, and compared to the option using 1 l/t, it was 8 pieces more. When the rate of use of the preparation was increased from 3 liters/ha to 13 liters/ha, it was found that this indicator was 42, 46, 47 units, respectively. It can be seen that the number of nuts in one plant increased as the dose of the preparation increased, but the best result was obtained from the variant that used 13 liters/ha.

When the amount of ripe nuts was determined as a percentage, it was 57.9 percent in the control variant, and it increased from 69.0 percent to 76.6 percent when the biopreparation of the Mikroo'stirgich was used. It was also observed that the number of nuts increased, and the best result was obtained from the variant that used 13 liters/ha. When the productivity of one bush was determined, it was 18.34 grams in the control option, and it was increased from 21.70 grams to 26.74 grams in the options where the biopreparation was used. In the experiment, the weight of nuts per plant was determined, and in the control variant, this indicator was 12.75 grams. It was observed that when the Mikroo'stirgich biopreparation was used at different rates, it increased from 15.21 to 19.66 grams. When the extraction of kernels was determined in the peanut, it was found that the rate of kernel extraction in the control variant was 69.5 percent. When exposed to biopreparations of different norms, the percentage of rate of kernel extraction was observed to increase, and it was found that it increased from 70.1% to 73.9% according to the options. It is known that the weight of 1000 grains is considered as a variety indicator, but it varies depending on the growing conditions. When the weight of 1000 grains was analyzed in the experiment, it was found that in the control variant this indicator was 755.2 grams, and in the variants affected by the biopreparation, the weight of 1000 grains also increased as the dosage of the preparation increased, and according to the variants, it was found to be 768,7-774,6 grams.

CONCLUSION

It was found that increasing the rate of application of Mikroo'stirgich preparations to peanut varieties increases the quantitative indicators of all yield elements. When peanut varieties were exposed to the biopreparation at different

rates, the best result in all varieties was obtained from the 10 liter/ha norm, and the relatively high result was obtained from the "Leader" variety.

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