THE EFFECT OF PEANUT SEEDLING DENSITY AND BIOGUTTEN APPLICATION ON SOIL BULK DENSITY IN SOILS PRONE TO IRRIGATION EROSION.

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Abstract: This article discusses the results of field trials conducted to determine the soil volume loss of peanut seedlings and the criteria for using the biological preparation Biogutten in its cultivation.

Keywords: Soil, soil volume loss, seedling survival, Biogutten, biological preparations, soil density, peanuts, irrigation erosion, absolutely dry soil.

In order to determine the effect of peanut seedling thickness and biogutten, a biological preparation, on soil bulk density in soils affected by irrigation erosion in the Andijan region, field experiments were conducted in the fields of the farm called **"Gold fiber cotton"** located in the Andijan district, with an elevation of 2.5 0C.

Soil bulk density (soil density) is one of the most important physical characteristics that determine soil productivity and is expressed as a ratio to the volume of absolute dry soil. Soils with good grain size and structure have a low bulk density, while compacted soils have a high bulk density. If the soil has a high amount of organic matter, its bulk density will be low.

Due to the influence of the thickness of the peanut seedling and the applied biological preparation Biogutten on the density of the soil of the experimental field, it was found that there were differences between the options by the end of the period of operation (Table 2.3). In 2023, when the field experiments were conducted, it was found that the initial volume weight of the soil was 1.298 g/cm3 in the 0-30 cm layer, and 1.358 g/cm3 in the 30-50 cm layer.

In the lands of Andijan region, where the peanut seedling density was 142 thousand units/ha, and in the control variant, where no biological preparation was used, the soil bulk density was 1.405 g/cm3 in the 0-30 cm layer and 1.432 g/cm3 in the 30-50 cm layer. In the second variant, where peanuts were planted at this seedling density and 1 l/ha of Biogutten biological preparation was applied per hectare, the soil bulk density was 1.395 g/cm3 in the 0-30 cm layer and 1.425 g/cm3 in the 30-50 cm layer.

In variants 3-4 of the conducted field experiments, i.e., when the density of peanut seedlings was 142 thousand units/ha, and the biological preparation "Biogutten" was applied at a rate of 2 and 3 l/ha, the soil bulk density was 1.390-1.389 g/cm3 in the 0-30 cm layer, and 1.422-1.420 g/cm3 in the 30-50 cm layer, respectively. This shows that the soil bulk density improved when the biological preparation "Biogutten" was sprayed and the application rate was increased.

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 14 Issue: 04 in April-2025
https://www.gejournal.net/index.php/IJSSIR

In the dissertation work, it was found that when the seedling density was 166 thousand units/ha, the bulk density of the soil in the 0-30 cm layer in option 5, where no biological preparation was used, was 1.403 g/cm3, while in options 6-7-8, where the biological preparation "Biogutten" was used at rates of 1 l/ha, 2 l/ha, and 3 l/ha, the bulk density of the soil was 1.387 g/cm3, 1.385 g/cm3, and 1.382 g/cm3, respectively.

Table 2.3

The effect of peanut seedling density and the use of the biological preparation Biogutten on soil bulk density, 2023

№	Thickness of the tree	Biological drug standard, l/ha	Soil bulk density, g/cm3	
			0-30 sm	30-50 sm
	At the beginning of the period of action		1,298	1,358
1	142 thousand units/ha	Control	1,405	1,432
2		Biogutten 1 l/ha	1,395	1,425
3		Biogutten 2 l/ha	1,390	1,422
4		Biogutten 3 l/ha	1,389	1,420
5	166 thousand units/ha	-	1,403	1,433
6		Biogutten 1 l/ha	1,387	1,414
7		Biogutten 2 l/ha	1,385	1,411
8		Biogutten 3 l/ha	1,382	1,409
9	285 thousand units/ha	-	1,397	1,421
10		Biogutten 1 l/ha	1,378	1,405
11		Biogutten 2 l/ha	1,370	1,403
12		Biogutten 3 l/ha	1,368	1,399
13	333 thousand units/ha	-	1,389	1,400
14		Biogutten 1 l/ha	1,362	1,397
15		Biogutten 2 l/ha	1,354	1,388
16		Biogutten 3 l/ha	1,350	1,369

It was noted that when the seedling density of peanut, a legume crop, increased to 285 thousand units/ha, the soil bulk density was even better. According to the results, in the 10-10-12 variants, where the seedling density was 285 thousand units/ha, the biological preparation "Biogutten" was applied at rates of 1 l/ha, 2 l/ha, and 3 l/ha, the soil bulk density in the 0-30 cm

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 14 Issue: 04 in April-2025
https://www.gejournal.net/index.php/IJSSIR

layer was 1.378 g/cm3, 1.370 g/cm3, and 1.368 g/cm3, respectively, which was 0.027 g/cm3, 0.035 g/cm3, and 0.037 g/cm3 lower than the control variant.

The data obtained from field experiments show that the variants with the best soil bulk density were found to be variants 13-14-15-16, where the peanut seedling density was 333 thousand units per hectare. When analyzing the results obtained from these variants, it was found that the soil bulk density of the above variants, where peanut seedlings were planted at a density of 333 thousand units per hectare, was 0.016 g/cm3, 0.043 g/cm3, 0.051 g/cm3, 0.055 g/cm3 better than the control.

In conclusion, among the variants studied with peanuts planted on soils subject to irrigation erosion, the lowest soil bulk density was observed in variant 16, which was 1.350 g/cm3 in the 0-30 cm layer of soil and 1.369 g/cm3 in the 30-50 cm layer. The main reason for this is that peanuts are leguminous crops that accumulate free nitrogen from the air in the soil, and the use of the biological preparation "Biogutten" at the highest rate during the growing season, which accelerated the physiological processes in plants and allowed the plant to use nutrients in the soil in a timely and effective manner.

References.

1. Эгамов Х., Рахимов А., Турсунов И., Жўраев А., Холмуроджонов Ж., Устойчивость сортов и линий хлопчатника к паутинному клещу //«Модернизация сферы образования и науки с учетом мировых научно-технологических трендов» сборник научных трудов по материалам международной научно-практической конференции. -Белгород:2020. 12-14 с.

2. Эгамов Х., Кимсанов И., Рахимов А., Жўраев А.Н, Холмуроджонов.Ж., Вопросы методики селекции и комбинационной способности сортов хлопчатника //«Модернизация сферы образования и науки с учетом мировых научно-технологических трендов» сборник научных трудов по материалам международной научно-практической конференции. -Белгород:2020. 15-18 с.

3. Турсунов Х., Жўраева Ҳ., Жўраев А.Н. The effect of rice sowing on the seedling method for different periods planting pattern and the number of seedlings // Ж. Psychology and education ISSN:00333077 (2021) 58 (1): 5517-5525

4. Жўраев А.Н., Мамадалиев З., Холмуроджонов Ж. Основные агротехнических мероприятияпри возделывание озимой пшеницы // Ж. Science and world international scientific journa. ISSN: 2308-4804. №6(82), 2020. 33-б.

5. Жўраев А., Мамадалиев З., Холмуроджонов Ж., Пути повқшения плодородия почв и урожай озимой пшеницы // Ж. The Way of Science international scientific journal. ISSN: 2311-2158. №6(76), 2020. 21-б.

6. Жўраев А.Н., Алимов.Ф.М., Исмоилов.О, Кузги буғдой кўчат қалинлигини тупроқнинг агрофизик хоссаларига таъсири // ISSN: 2181-3337 SCIENCE AND INNOVATION international scientific journal. https:// doi.org/10.5281/zenodo.6673233/ 100-104 б.

7. Жўраев А.Н., Алимов.Ф.М., Исмоилов.О, Кузги буғдой Агротехнологияси ва дон ва ҳосилдорлиги // ISSN: 2181-3337 SCIENCE AND INNOVATION international scientific journal. https:// doi.org/10.5281/zenodo.6673319/ 105-109 б.

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 14 Issue: 04 in April-2025
https://www.gejournal.net/index.php/IJSSIR