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THE EFFECT OF PLANT NUTRITION ON THE AGROPHYSICAL PROPERTIES OF DARK LIGHT GREY SOILS

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Abstract
In this article, it was studied that root fertilization and fertilization through the leaves of plants developing in the spring period allowed to improve the agrophysical properties of soils. It was found that as a result of leaf fertilization of plants developing in spring (HUMIMAX,0.5 l/ha) and root fertilization (NH4NO3, 50 kg/ha), the volume weight decreased by 0.03-0.04 g/sm3, soil porosity increased by 2.2-1.6 %

Keywords: Bulk weight, soil porosity, physico-chemical, hydrophysical, biological, specific gravity, Gumimax agent.

Introduction

In many studies, measures taken to grow crops in arable land have a negative impact on the agrophysical properties of the soil. In particular, when technical crops are planted, soil compaction increases
[1;]. The agrophysical properties of soils can be improved by using effective tillage techniques and technologies
[2;]. However, in the conditions of the study area, which is a light gray soil, it is possible to improve soil properties without planting field crops and without tilling the soil.
It is important to control desertification in order to increase the resistance of sandy desert soils to drought and wind erosion. In this regard, it is necessary to use biochar to improve soil properties. The authors determined the effect of biochar particle size and application rate on the hydraulic and physical properties of sandy desert soils. Biochar was produced by pyrolyzing corn straw at 500°C with limited oxygen. Sandy desert soil samples from the Tengger Desert in northwest China were developed with three biochar particle sizes (0-0.25, 0.25-1, and 1-2 mm). The soil water, porosity, and structure were improved. [3;]
The effect of green mass cultivation for livestock feed and soil properties improvement on the agrophysical properties of soils by feeding plants growing in the spring season through root and

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leaf feeding on light gray soils was studied. During the conducted research, the general physical and mechanical properties of the soil were studied.

The research emphasized the relative reduction of soil degradation and improvement of their physical and mechanical properties as a result of planting shrub plants in desert and semi-desert conditions. [4;]

Object and subject: The agrophysical properties of light gray soils distributed in the area of the Guzar district, which is a part of the JTL, were studied.

Method: Field research was conducted according to the "Methods of conducting field experiments" of the former UzPITI.

Progress and results: In the experimental system, the following changes in the general physical properties of the layers 0-19 and 20-32 cm were determined in the autumn: option 1 control (no feeding measures were carried out), option 2 N_50 (NH_4NO_3 was fed at a rate of 50 kg/ha), option 3 ("Gumimax" foliar feeding at a rate of 0.5 l/ha) and option 4 ("Gumimax" foliar feeding at a rate of 0.5 l/ha and NH_4NO_3 root feeding at a rate of 50 kg/ha).

The experimental plot of the research area, variant 1, in the 0-19 cm (A_{chim} and $A_{chim\ sub\text{-}soil}$) and sparsely distributed root system (20-32 cm) layers, had a specific gravity of the initial soil of 2.574; 2.632 g/cm^3, bulk density of 1.184; 1.298 g/cm^3, porosity of 54; 50.7%; variant 2, specific gravity of 2.573; 2.634 g/cm^3, bulk density of 1.189; 1.296 g/cm^3, porosity of 53.8; 50.8%; variant 3, specific gravity of 2.571; 2.639 g/cm^3, bulk density of 1.192; 1.301 g/cm^3, porosity of 53.6; 50.7% and variant 4 had a specific gravity of 2.578; 2.638 g/cm^3, a bulk density of 1.194; 1.296 g/cm^3, and a porosity of 53.7; 50.9% (Table 1).

Table 1 The effect of plant nutrition on soil agrophysical properties is an experimental field located in the north of the research area

No	Options	Layer , cm	Initial (2021)			Final (2023)		The difference is ±	
			Comparison weight , cm3	Volume weight , g/cm3	Porosity , %	Volume weight , g/cm3	Porosity , %	Volume weight , g/cm3	Porosity , %
1	Option 1 (Control)	0-5	2,574	1,184	54.0	1,178	54.2	-0.01	0.2
		6-19							
		20-32	2,632	1,298	50.7	1,298	50.7	0.00	0.0
2	Option 2 (ammonium nitrate-50 kg/ ha of NH_4NO_3)	0-5	2,573	1,189	53.8	1,159	54.9	-0.03	1.2
		6-19							
		20-32	2,634	1,296	50.8	1,286	51.2	-0.01	0.4
3	Option 3 (0.5 l/ha "Gumimax")	0-5	2,571	1,192	53.6	1,166	54.8	-0.03	1.2
		6-19							
		20-32	2,639	1,301	50.7	1,286	51.3	-0.015	0.6
4	Option 4 (0.5 l/ ha "Gumimax"+50 kg/ ha NH_4NO_3)	0-5	2,578	1,194	53.7	1,154	55.2	-0.04	1.6
		6-19							
		20-32	2,638	1,296	50.9	1,286	51.2	-0.010	0.4

In the control variant 1, where no feeding measures were carried out for plants growing and developing in the spring, the soil bulk density decreased by 0.01 g/cm^3 in the 0-19 cm (A_{chim} and

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$A_{chim\ sub\text{-}layers}$) and the porosity increased by 0.2%, or the bulk density was 1.178 g/cm^3, and the porosity was 54.2%. In the 0-19 cm (A_{chim} and $A_{chim\ sub\text{-}layers}$) and the sparsely distributed root system (20-32 cm) of the variant 2, which was fed at a rate of 50 kg/ha, the soil bulk density was 1.159; 1.286 g/cm^3, and the porosity was 54.9; 51.2%. In the 0-19 cm (A_{chim} and $A_{chim\ sub\text{-}trees}$) and sparsely distributed root system (20-32 cm) layers of option 3, foliar feeding with the "Gumimax" tool at a rate of 0.5 l/ha, the soil bulk density decreased by 0.03; 0.02 g/cm^3, the soil porosity increased by 1.2; 0.6%, or the soil bulk density decreased by 0.03; 0.02 g/cm^3, the soil porosity increased by 1.2; 0.6%, or the soil bulk density decreased by 1.162; 1.286 g/cm^3, soil porosity 54.8; 51.3%. In variant 4, with foliar feeding of "Gumimax" at a rate of 0.5 l/ha and root feeding of NH_4NO_3 at a rate of 50 kg/ha, it was determined that the soil bulk density was 1.154-1.286 g/cm^3, soil porosity 55.2; 51.2% [5,6].

Conclusion

According to the results of the study, it is possible to improve the general physical properties of the soil by foliar and root feeding of plants growing in the spring period in areas used as pastures

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