ACADEMICIA

ISSN: 2249-7137 Vol. 11, Issue 9, September 2021 Impact Factor: SJIF 2021 = 7.492

ACADEMICIA
An International Multidisciplinary Research Journal
(Double Blind Refereed & Peer Reviewed Journal)

DOI: 10.5958/2249-7137.2021.02049.8

DETERMINATION OF THE AGROPHYSICAL PROPERTIES OF THE SOIL

Zokirova S.Kh*; Jamolov R.K; Boboyev B***; Kodirova N*****

[1,3]FerSU,
UZBEKISTAN

****Fergana Polytechnic Institute,
UZBEKISTAN

ABSTRACT

The physical and mechanical properties of the soil are one of the most important factors that determine the quality of its processing and the conditions for the growth and development of cultivated plants, the level of their productivity. The density of the solid phase of the soil is the ratio of the mass of its solid phase to the mass of water in the same volume at 40C. Different soil types and even individual soil horizons have different solid phase densities. The density and structure of the arable layer largely depend on the granulometric composition of the soil and its genesis.

KEYWORDS: *Determine, Productivity, Horizons, Arable*

INTRODUCTION

Agrophysical factors and soil structure are the most important conditions for its fertility. They do not provide plants with any of the elements of fertility necessary for their growth, but they can change the development of plants. Therefore, knowledge of the agrophysical characteristics of the soil and the ability to regulate them are necessary for the expanded reproduction of soil fertility and the growth of crop yields.

The physical properties of the soil are subdivided into general and physical and mechanical. The general physical properties of the soil include the density of the solid phase, density and porosity (duty cycle), the physical and mechanical properties - plasticity, stickiness, swelling, shrinkage, cohesion, hardness and resistance during processing. The density of the solid phase of the soil is the ratio of the mass of its solid phase to the mass of water in the same volume at 40C. Different soil types and even individual soil horizons have different solid phase densities. Soil density is

the mass of absolutely dry soil, Suitable in its natural state, per unit volume. It is measured in g / cm3. The porosity, or duty cycle, of the soil is the total volume of all pores between the particles of the solid phase of the soil. It is expressed as a percentage of the total soil volume. Plasticity is the property of the soil to change its shape under the influence of any external force without disturbing the addition and to maintain the given shape after the elimination of this force. The lower limit of plasticity is the upper limit of soil moisture, at which its mechanical processing is possible, or the upper limit of the optimum moisture for processing.

Shrinkage - a decrease in the volume of the soil when it dries. It depends on the same factors as swelling. The more swelling, the more shrinkage. Soil resistivity - the effort expended on the implementation of technological processes (cutting the layer, wrapping it) and overcoming friction on the working surface of tillage implements during soil cultivation.

The main physical, physical-mechanical and water indicators together determine its suitability for mechanical processing. The state of the soil, in which, during the process of mechanical processing, it crumbles well and does not stick to the processing tools, is characterized by physical ripeness. In this state, the soil is physically ripe, ripe and suitable for high-quality mechanical processing. Outside of physical ripeness, the soil is poorly cultivated, the cultivation process requires more tractive effort, more labor, time and money, it is necessary to cultivate only at the moment of physical ripeness. The physical ripeness of the soil is determined by the granulometric composition, structure and content of humus and water in the soil. These factors are not equal. On soils with a heavy granulometric composition, with a high content of physical clay, soil moisture has a primary effect on "ripening" - the readiness of the soil for high-quality cultivation. The optimum moisture content when processing heavy soils is 50% of the field moisture capacity. A slight deviation of moisture from this value up or down makes the soil unsuitable for high-quality cultivation. The physical and mechanical properties of the soil are one of the most important factors that determine the quality of its processing and the conditions for the growth and development of cultivated plants, the level of their productivity. In this case, the structure, density, hardness and stickiness of the soil are of the greatest importance. These properties, in combination with moisture, determine the readiness of the soil for processing, its quality and the living conditions of plants.

The agronomically valuable lumpy-granular structure, giving the soil a loose texture, facilitates the germination and spread of plant roots, and also reduces the energy costs for mechanical soil cultivation. Unstructured soils, in comparison with structural ones, possessing greater cohesion, have a stronger resistivity during cultivation.

The density and structure of the arable layer largely depend on the granulometric composition of the soil and its genesis. In the process of mechanical tillage, these characteristics change. Their transformation is aimed at optimizing the aeration conditions for the root layer of the soil.

Physicomechanical and physical properties of soils are discussed. Of these, density, porosity, and hardness are the most important for understanding the ecological functions of sands. Perhaps for the first time the thermal regime of sandy soils has been analyzed so clearly. It is shown that strong heating of sands under natural conditions leads to an increase in the mobility of phosphorus and potassium compounds, which are necessary for plants. In sands, a leaching regime (only 5% of years of soil may not be wetted to the entire thickness), periodically non-washing (when up to 10% of years the soil is not wet to the entire depth), periodically washed

(when wetting is observed only in 10% of cases) and non-washing water regime (wetting of sandy soil only in 5% of cases).

The determination of the agrophysical properties of the soil is divided into:

a) the moisture content of the sand by the listening method before watering, on days 3, 6 and 9 after watering, and before flowering at a depth of 70 cm, during flowering and fruit formation up to 1.5 m every 10 cm;

b) Water permeability by the cylinder method;

c) Field moisture capacity of sand;

d) Bulk density of sand;

e) Capillary border.

The laboratory determined the mechanical, salt composition of the soil, the content of humus, nitrogen, phosphorus and potassium, CO2 carbonates in the soil.

In order to study the dynamics of the nutrient regime, soil samples were taken before and on days 3, 6, 9 after watering. To study the leaching of nutrients in a laboratory experiment, water samples were taken. The humus content in the soil was determined by the method of IV Tyurin; total nitrogen - by the Kjeldahl method; nitrates-colorimetric method Granvald-Lyazhu, assimilable forms in the soil of phosphorus-according to Machigin and potassium according to Protasov.

At the end of the growing season, plant samples were taken from 2 replicates for 10 s of each variant to determine the dry weight of cotton.

REFERENCES

1. K. Mirzazhonov, M. Nazarov, S. Zokirova, N. Yuldashov. Stupid mukofazasi. Darslick. Tashkent, 2004.

2. Zakirova S.Kh. Irrigation regime for various varieties of cotton on the scaffold of deflated light gray soils of the Fergana Valley. Abstract. Tashkent 1987.

3. Akhmedovich, M. A., & Fazliddin, A. (2020). Current State Of Wind Power Industry. *The American Journal of Engineering and Technology*, *2*(09), 32-36.

4. Dilmurod, R., & Fazliddin, A. (2021). Prospects for the introduction of artificial intelligence technologies in higher education. *ACADEMICIA: an international multidisciplinary research journal*, *11*(2), 929-934.