THE RESULTS OF THE STUDY OF PHYSICAL, MECHANICAL AND TECHNOLOGICAL PROPERTIES IN BASIC SOIL CULTIVATION

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Qualitative softening of compacted soil and weed control is the main purpose of tillage. Soil softening improves the physical and mechanical properties of the soil, the water, air, heat and nutrient regimes, also improves the activity of various beneficial micro-organisms, accelerates the breakdown of organic matter, nutrients in the form are easily absorbed by plants and are formed in the soil. In the following years, the focus of agricultural specialists and farmers has been on the rational and efficient use of land resources and the production of quality crops. This requires important measures, such as improving the reclamation of irrigated land, reducing soil salinity and preventing erosion.

The widespread use of efficient tillage practices and soil protection technologies is the basis for increased soil productivity, as well as crop productivity. For this reason, in developed countries, including arid and more saline regions, the introduction of high-tech cultivation is of great importance. Proper use of these technologies will be more effective on farmland in Bukhara province, where soil density is hard and salinity levels are higher.

The main method of tillage is ploughing. Activities such as ploughing, planting and tending crops form a science-based farming system. It is designed to put economical tillage methods and new technologies into practice. Many scientists (G. M. Rudakov, V. P. Kondratyuk, M. M. Murodov, N. S. Bibutov and others) studied physical-mechanical and technological properties of soil: hardness, moisture, density, granularity.Knowledge of the physical, mechanical and technological properties of land, as well as the correct and rational use of land by agri-holding specialists, determines the increase in yields.

Physical-mechanical and technological properties of soils: hardness, moisture content, density and granularity have been studied by many scientists (G.M. Rudakov, V.P. Kondratyuk, M.M. Murodov, N.S. Bibutov and others).

Because the nature of the soil is variable, the hardness, density and moisture of the soil must be examined before ploughing. It is known that in agricultural conditions the soil is compacted mainly by external forces. For example, a certain volume of soil is compressed vertically and expanded horizontally by the pressure of the tractor wheels. During compaction, the porosity of the soil decreases and the air it contains is squeezed out. If the amount of humus in the soil is sufficient, the soil retains this property well.

You should also pay attention to the level of soil salinity when cultivating the soil. It is not uncommon for salinisation to occur in areas where seepage water is located. In areas with increased salinity, the application of the necessary techniques and technologies for deep groundwater seepage placement cannot be considered satisfactory. The reasons for this are: unreasonable technological processes for autumn salt washing; lack of special deep softening

equipment and existing defects; lack of quality planning works; shortcomings in ensuring efficient operation of drains and lakes; lack of special devices for opening up drainage on lands where groundwater seepage is in the surface layer and existing ones are not properly used.

Therefore, in order to study the physical and mechanical properties of the soil, i.e. hardness, density, moisture, studies were carried out in the fields of the KMITI educational and experimental farm. To ensure the accuracy of the data, the experiments were carried out on a special field, which had been levelled and watered in advance. A ring force penetrometer was used to investigate soil hardness.

The purpose of the sharp cone is to make it easier for the rod to penetrate the soil with the lever. The boom function helps to measure the hardness of the soil in the desired layer. And the metal device that connects the ring to the handlebar grip has the function of connecting the ring to the handlebar grip. The metal ring is circular and bends under pressure to actuate the spring device. The screw adjustment mechanism is located above the retaining ring and drives the spring-loaded metal. The penetrometer handle is used to hold it upright and to insert the steel tip into the soil.

Table 1

Soil hardness, moisture and densityi

Cultivated area under study			Soil test results: by depth (cm)					
		0-10	10-20	20-30	30-40	40-50	50-60
An alfalfa field	*Humidity ,%*	8,042	8,47	9,27	9,49	14,71	17,12
	Hardness, (MPa)	1,78	3,18	4,38	4,48	4,89	5,45
	The density ,he/см³	1,23	1,31	1,37	1,53	1,75	1,62
cleared field from cotton	*Humidity ,%*	11,45	13,18	11,39	12,12	13,01	18,61
	Hardness, (MPa)	3,68	2,78	3,78	5,38	4,21	3,61
	The density ,he/см³	1,32	1,28	4,38	1,36	1,45	1,59
Wheat field	*Humidity ,%*	19,60	18,31	17,62	15,46	13,01	18,61
	Hardness, (MPa)	2,69	3,80	3,81	5,39	3,35	4,51
	The density ,he/см³	1,29	1,33	1,35	1,39	1,45	1,75

To determine soil moisture, samples were taken from different depths using drills. An EP meter was used to obtain characteristics of constant moisture content. The amount of moisture depends on the size of the field, this occurs 2-3 days after irrigation or after a heavy rain..

To measure the relative resistance, the drill pile must be driven to the desired depth with the EA. If resistance is felt when rotating, the sample is taken shorter and the drill returned a full turn. It is recommended that the drill bit is lifted and gently rotated. Take a spatula to take a sample from the body. A layer must be used to obtain an acceptable result. The ES sensor must be placed without rotation. After lifting the drill bit, it is slowly twisted in a slightly bent position, the resulting sample will fall out of the drill bit, if it is sticky, it can be removed by hand or tapping, after which the sample is checked. After completing the work, the counter is cleaned of dirt and soil and put away in its case. So, while investigating soil humidity, hardness and density with above mentioned instrument at different depth in plots free of alfalfa, wheat and cotton, the following results were obtained: soil humidity in plot sown with alfalfa for 3 years was 0-10, 10-20, when investigating at the depth of 20-30 and 30-40 cm its humidity was increased to 8,042-9,49%, hardness was increased to 1,78-4,48 MPa and density was increased to to 1.23-1.53 g/cm3. Soil moisture in cotton fields was 11.45-12.12%, hardness 3.68-5.38 MPa, density 1.32-1.36 g/cm3; In the area sown with wheat, soil moisture was 19.60-15.46%, hardness 2.69-5.39 MPa, density 1.29-1.39 g/cm3..

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