

*K. Melnyk, L. Melnychuk, Master students
G. Parfenyuk, PhD, research advisor
N. Kurnosova, PhD in Phil., Ass. Prof., language advisor
Zhytomyr State Technological University*

FORMATION OF SOIL PHYSICAL STRUCTURE PARAMETERS IN RESTORED AREAS

In our paper we are concerned with physical structure parameters of the sod-podzolic sandy soil affected by Irshansk Mine-Concentrating Works operation in the Zhytomyr region. Soil physical properties include: texture, density, porosity, structure, consistency, soil moisture content. In our paper we considered its density and porosity.

By density we mean weight per unit volume of an object. Particle density is equal to the mass of solid particles divided by the volume of solid particles - it is the density of only the mineral particles that make up a soil, it excludes pore space and organic material. The normal soil density is 2,60 to 2,75 g/cm³.

Porosity is the total volume of all pores and spaces between the particles of the solid phase of the soil. Ideally, the total pore space should be 50% of the soil volume. The gas space is needed to supply oxygen to organisms decomposing organic matter, humus, and plant roots. Pore space also allows the movement and storage of water and dissolved nutrients.

The selected undisturbed samples of 0-20 cm soil layers were analyzed and their density and porosity parameters were measured. Measurements were made by mean of the cylinder 109 cm³ in volume. The results of our research are given in the table below.

The parameters of density and soil porosity

Soil layer, cm	Control				Reclamation			
	g/cm ³	Porosity, %			g/cm ³	Porosity, %		
		overall	capillary	no capillary		overall	capillary	no capillary
Ordinal indicators								
0-5	1,21	54,1	37,5	16,6	1,10	60,4	36,7	23,7
5-10	1,21	53,9	36,9	17,0	1,14	58,1	37,1	21,0
10-15	1,26	50,9	36,1	14,8	1,16	57,4	36,0	21,4
15-20	1,28	51,2	36,2	15,0	1,16	56,2	36,2	20,0
Average performance								
0-10	1,21	54,0	37,2	16,8	1,12	59,2	36,9	22,3
10-20	1,27	51,6	36,7	14,9	1,16	56,8	36,1	20,7
0-20	1,24	52,8	36,9	15,9	1,14	58,0	36,5	21,5

The data obtained show that the density of the restored samples changes with the depth and is 0.1 g/cm³ less than the control sample density. A gradual density increase reaches 58,0%, that 5,2% exceeds the control level. The capillary porosity does not change with the depth of the soil layer and its parameter is 21,5% that is 1,4 times higher than the control parameter.