

EXECUTION OF LABORATORY WORKS OF ECOLOGICAL CONTENTS ON MECHANICS

Z. A. Yavkacheva

teacher of the Tashkent Institute of Engineers railway transport
Tashkent, UZBEKISTAN

ABSTRACT

This article highlights the environmental performance of laboratory work.

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INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The laws of nature are the same as they were in the past, as they are now, and will continue to remain so. In order to have a holistic view of nature, it is necessary to know and understand nature and its laws well. Knowledge of the laws of nature allows us to obtain accurate information:

1. About the methods and ways of disclosing the elemental phenomena of nature;
2. On the existence of a relationship between the laws of nature and society
3. Promotes the prediction of the future of nature and man, organically linked to the laws of nature.

Under the conditions of the serious influence of human activity based on the development of science and technology on the environment, forecasting, the future, relying on knowledge of the laws of nature is important. In order to so that the impact of human activities on the environment does not cause human disasters, it is necessary to anticipate its consequences

For this it is necessary to have a complete understanding of nature and its eternal laws, to be able to apply it and to know the sciences that study nature and its laws.

It is necessary to have a clear knowledge of the laws of nature that study physics, astronomy, biology, chemistry and technology.

It is a good idea that the riddles in the school physics textbook basically begin with a study of mechanics.

It is important to focus on an interdisciplinary approach to problem solving, as well as to teach students environmental education in teaching mechanics

1 laboratory work

Studying the effect of soil density on plant growth

The goals of environmental education: to study the effect of soil density on plant growth, to explain to youth the need for knowledge of the scientific basis for preparing seeds and fields for sowing.

Necessary instruments and accessories: scales accurate to 200 g and weights, a beaker for measuring the volume of a soil sample (in cm³), bar, hammer, electric stove, small metal sheet, local fertilizer, smooth metal spatula.

The content of the work.

Soil is the upper, fertile, porous layer of the earth that has organic and mineral substances, water, air and microorganisms. The soil differs from rocks in its fertility.

Density is one of the main agrophysical characteristics of the soil. It depends on the ratio of soil fragments and soil composition. If the soil is dense, then water and air do not penetrate into it, it is quickly drained due to wind and қатқалоқ is formed, as a result of which the fertility decreases.

The density of the soil is characterized by mass in a single volume, porosity and other physical parameters that are important in soil formation and increase its quality indicator, such as fertility. The training of these properties is especially important in agricultural conditions, since as a result of irrigation and periodic passage of tractors and agricultural machines, the soil is mechanically compacted and the microorganisms that are in its composition die.

The density of the soil depends on the mechanical composition of minerals and organic substances.

Dense soil is called if there are difficulties in plowing and harrowing.

As a result of compaction of the upper layer of the earth, due to the high density of the soil, the supply of plants with nutrients decreases.

Soil density can be affected by methods of cultivating the land - changing the density of the soil, applying organic fertilizers, freezing water, etc.

In agriculture, especially in cotton growing, one of the important soil quality indicators is density. Soil density is of great importance in the growth and development of plants. As a result of changes in density, microbiological processes in the soil also change. In Central Asia, soil density is of great importance in the growth and development of cotton.

The soil of Central Asia is prone to the formation of қатқалоқ. The heavier the mechanical composition of the soil, the capillary tubes of the soil are restored during the formation of Satalo, and the moisture of the soil evaporates faster, preventing the germination of cotton, and causes the seedlings to discharge.

In the life of plants, capillaries are important, through which not only water, but also various other solutions, rising up, as a result of biochemical and energy metabolism under the influence of sunlight, contribute to the development of plants. Timely nutrition of agricultural plants is important in their growth and development. The manifestation in nature of such laws of physics as capillarity, internal friction, viscosity is explained by the formula, which is called the Juren formula. Here is the internal radius of the capillary, is the acceleration of gravity, is the height of the liquid column, is the coefficient of surface tension, is the density of the liquid, is the limiting angle.

The value located on the right side of the equation is called the constant capillarity and is the physicochemical characteristic of the liquid. According to this formula, the smaller the inner radius of the capillary, the higher the liquid rises through the tube. The composition of the soil and trunks of plants also contains capillary structures through which various solutions and liquids rise upward and intensively evaporate.

If қатқалоқ is formed after germination of weed plants, then they compress the trunks of plants and have a negative effect on normal physiological processes. Therefore, on sowing fields, mandatory loosening of the soil after spring rains is necessary.

In order to prevent қатқалоқ and weed growth, early treatment of seedlings is necessary. Especially early care of seedlings is significant in years with inconvenient weather. Because the more rain, the more soil is compacted and conditions are created for rotting cotton roots and weed growth. The sooner we start cultivating the soil under such conditions, the faster the soil heats up. The timing and depth of processing of cotton beds depends on the condition of the soil, pollution by weeds and weather conditions. These measures are aimed at removing weeds, loosening the soil, that is, creating favorable conditions for microorganisms, free access of air to the roots of the soil and preserving moisture.

Compaction, hardening of the soil not only reduces the soil, but also contributes to the lack of nutrients needed for plants.

Well-treated, humus-rich soil has a lower density, which has an important role in the flow of biological processes and the accumulation of necessary substances for plant development.

In order to increase soil fertility, local fertilizers are used. These include livestock and poultry manure, municipal waste and others, which in addition to their composition still have trace elements necessary for plants. Local fertilizers play an important role in improving soil quality. Heavy, loamy soil is less compacted under the influence of local fertilizers and comes to a mud state, it is easy to process, access to water and air increases, it heats up faster.

Often people burn autumn leaves, which in turn leads to environmental pollution. And if you dig in the fallen leaves, then by spring they will turn into vermicompost. And this positively affects the fertility of the soil and reduces air pollution.

Soil density for cultivated plants should be 1.0 - 1.2 s / cm³ and this indicator varies depending on the type of plants and soil properties. If the soil density in the most optimal range exceeds the value of 0.01 g / cm³, the fertility of cereal plants decreases by 0.35 - 0.6 c / ha, and potatoes - by 1.0 - 2 c / ha. In order to check the suitability of compacted soil for sowing and to study the effect of soil density on plant life, we will familiarize ourselves with the procedure for the following laboratory work.

The order of the work:

1-way

1. Measure the soil sample from the garden in grams using a lever scale.
2. Measure the volume of the soil sample using a beaker (in cm³).
3. Determine the density of the soil sample using the formula.
4. Perform the above measurements for heated soil in the same manner.
5. Seal the other part of the soil sample and determine its density in the same way.
6. Determine the volume of compacted soil using a beaker.
7. The results of measurements and calculations in table 1.

Table 1

Soil sample	Sample weight, m	Sample volume, V	Soil sample density $\rho = \frac{m}{V}$.
1. Garden soil sample			
2. Heated soil			
3. Compacted soil			

Method 2

1. Measure the mass of soil saturated with local fertilizers using lever weights (in g).
- 2.. Measure the volume of the soil sample using a beaker (in cm³).
3. Determine the density of the soil sample using the formula.
4. Calculate the density of the heated soil sample by the above method.
5. Seal the other part of the soil sample and calculate its density using the above method.
6. The results of measurements and calculations in table 2.

table 2

Soil sample	Sample weight, m	Sample volume, V	Soil sample density $\rho = \frac{m}{V}$.
1. A sample of soil saturated with local fertilizers			
2. Heated soil			
3. Compacted soil			

(compare the density of the samples and draw conclusions).

Questions for self-control

1. Why did the density of compacted soil turn out to be higher?
 2. What effect does this development of plants have?
 3. How to cultivate the soil to create favorable conditions for seedlings sprouting?
 4. Why is it difficult to sprout seedlings after rain?
- What do you think is the reason for the fertility of the soil saturated with fertilizers?

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