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DETERMINATION OF TOTAL PHOSPHORUS, HUMUS AND NITROGEN IN SOIL SAMPLES FOUND IN KHOREZM REGION AND THEIR ROLE IN INCREASING SOIL FERTILITY

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Abstract
Increasing soil fertility is one of the most pressing problems. The reason is that fertile soils are extremely necessary for high productivity. Especially in the development of wheat, barley, rice and other high-need branches of today's agriculture, it is becoming necessary to study the chemical composition of the soil and increase its fertility by chemical, biological, biotechnological methods. This article talks about a partial solution to such problems.

Keywords: soil, chemical composition, humus, nitrogen, phosphorus, earthworm, analysis, plant, feed.

Introduction

Literature analysis: Simultaneous determination of total nitrogen, phosphorus, potassium in the soil by the Mesheryakov method is based on the determination of one soil extract based on burning in concentrated sulfuric acid (in the presence of hydrochloric acid) [1]. The solid phase of the soil holds the main reserve substances for plants. 90-99% of the soil solid phase is made up of mineral substances, only a few percent of organic substances. Although the amount of organic matter is very small, it plays an important role in determining soil fertility. According to A.P. Vinogradov, almost half of the solid phase of the soil is oxygen, one third is silicon, more than 10% is aluminum and iron. Only about 7% is contributed by other elements. All these elements are found in the mineral part of the soil, in various mineral compounds [2].
While carbon, hydrogen, oxygen, phosphorus, sulfur are found in the composition of both mineral and organic parts of the soil, nitrogen is included only in the composition of organic substances [3,4]. The amount of gross nitrogen in the soil is directly related to the amount of humus and phosphorus: in soils rich in organic matter, nitrogen is much more, but the granulometric composition of potassium varies depending on the parent rock. The amount of phosphorus in the crust of the earth is 0.12% or 1 (1015 tons). The total amount is 5-50 times

more than nitrogen and 8-40 times more than phosphorus, so soils usually have more reserves of potassium than nitrogen and phosphorus [5].

Materials and methods: During our experiments, we used general physiological, agrochemical methods and Mesheryakov, Vinogradov, Kessler, Dospekhov statistical analysis methods. Soil samples were taken from farms in Khorezm region. The experiments were carried out in the Department of Biotechnology of Urganch State University and the laboratories of XMA.

The progress and results of the scientific work: Our samples were taken from the soil up to 10 cm, because it is known from the literature that the upper layer is rich in all mobile nutrients. 2 g of the soil sample sieved with a pore diameter of 0.25 mm was taken on an analytical balance, turned into a conical flask with a capacity of 250 ml, moistened by pouring 1.5 ml of distilled water and adding 5 ml of concentrated sulfuric acid, 30 minutes left. Then, 1 drop of hydrochloric acid was added to the flask and a small funnel was placed in the mouth, and the mixture was burned on an electric stove until it became colorless. After that, the flask was cooled and the remnants of the mixture closed on the neck of the funnel and the flask were washed into the flask with 35 ml of distilled water. The solution was filtered into a 100 ml volumetric flask and filled with water up to the mark.

Total NPK amounts were determined by taking a certain amount from the same solution.

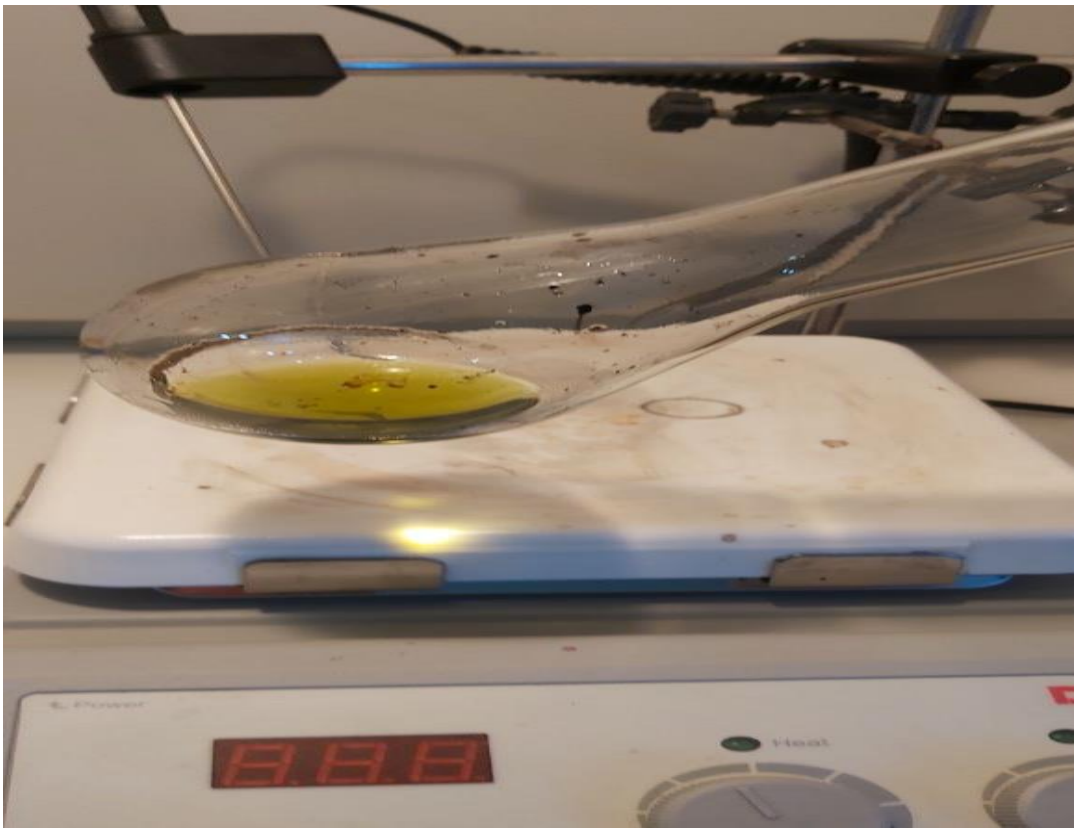

Figure 1. Determination of nutrients in the sample.

To determine the amount of total nitrogen, 2-3 ml of the filtrate was transferred to a measuring flask with a capacity of 50 ml, and 2 ml of Segnet salt solution was poured over it.
After 10 minutes, 35 ml of distilled water was poured into the measuring flask and neutralized with 5% NaOH solution until the blue litmus paper turned red. Then, 2 ml of Nessler's reagent was added to the mixture, resulting in the formation of yellow mercury-ammonium iodide:

$$2HgK_2I_4 + 3KOH + NH_3 = NH_2IHg_2O + 7KI + 2N_2O$$

$$X = \frac{a \cdot V_2 \cdot V_4 \cdot 100}{H \cdot V_1 \cdot V_3}$$

The mixture was mixed thoroughly, water was added to the mark and colorimetric using a light filter with a wavelength of 440 nm.
Instructions for calculating the results of laboratory work:
X = A · W · 1000/ V - T;
where: X is the amount of N-NH4, mg/kg;
A - amount of NH4 in the calibration curve, mg;
W - gross suction volume, ml;
V - the volume of suction taken for analysis, ml;
T - soil tension, g
10 ml of filtrate was transferred to a measuring flask with a capacity of 100 ml and 45 ml of water was poured over it.
In the presence of 2-3 drops of phenolphthalein, the solution was neutralized using a 10% NaOH solution until it turned pale pink, and water was poured up to the measurement line.
10 ml of the neutralized solution was transferred to a measuring flask with a capacity of 50 ml using a pipette, and 25 ml of water was poured over it. Then, 2 ml of molybdenum reagent was added, distilled water was poured up to the measurement line, and 0.5 ml of tin (I) chloride solution was added. The mixture turned blue, and it was colorimetric using a red light filter (#7). Instructions for calculating the results of laboratory work:
The amount of total phosphorus was determined by the following formula:
Here 150 X = P_2O_5 quantity, %; a = P_2O_5 the amount of in the calibrated graph, mg-100 ml V1= kul the volume of the solution in the ash-formed flask,100 ml V2= suyultirish uchun olingan eritma hajmi, 10 ml.volume of solution taken for dilution, 20 ml V3 = total volume of diluted solution, 100 ml V4 = volume of solution obtained from diluted solution, 10 ml.

Table 1

Soil layer sm	Phosphorus	Hummus	Nitrogen
10 c	0.085	0.412	0.036

Summary
Such mobile nutrient elements in the soil directly affect the formation of fertile and high-quality arable soil. Most of the soils in the territory of Khorezm region are of medium and high salinity,

and sometimes there are opinions that it is not necessary to use potassium fertilizers. It is advisable to use California earthworms, green fertilizers, and organic fertilizers to maintain and increase the above parameters in the soil.

REFERENCES:

1. Zokirov X.X. Agrokimyo. – T.: Universitet, 1998
2. Zokirov X.X. “Tabiiy resurslardan oqilona foydalanish”. Darslik. SurxonNashr-2020.
3. Zokirov X.X. “Surxondaryo tabiati va ekologiyasi”. O’quv qo’llanma. TerDU nashr matbaa markazi nashriyoti-2021.
4. Q.Rahmonov, Sh.Narbayev, Z.Muqimov “Yer resurslarini boshqarish”. O’quv qo’llanma. T.TIQXMMI, 2018.
5. H. T. Artikova, Sh.Sh.Nafetdinov, H.H.Salimova, S.S.Hojiyev, S.Sidiqov, J.Sattorov, S.Maxammadiyev,O.Ergasheva O‘simliklar oziqlanishi va o’g’itlar. O’quv qo’llanma. “Durdona” nashriyoti. Buxoro-2022.