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DYNAMICS OF MOISTURE RESERVES IN THE SOILS OF VARIOUS LANDS IN UKRAINIAN TRANSNISTRIA

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Plants and soil fauna cannot live without water. Water is essential to soil genesis, interacting with the mineral part of the soil, the atmosphere and soil air, and the biosphere. It is an important biophysical and biochemical reagent. Especially important are the upward and downward migration currents of soil moisture and their transfer of substances between genetic horizons, the introduction of substances into the soil profile to form hydrogen-accumulative horizons and the removal of substances outside the profile to form eluvial and eluvial-illuvial horizons.

The main source of soil moisture in different climatic conditions is atmospheric liquid (rain) and solid (snow) precipitation and groundwater. Condensed vaporized water also plays a certain, but less significant, role. The amount and chemical composition of water depends on the terrain, hydrological conditions of the territory, vegetation, soil-forming rocks, and other factors. An important factor is the hydromelioration applied in certain conditions - irrigation and drainage, which radically change the hydrological regime of a territory or a separate field [1].

Water content depends on the properties of the solid phase of the soil (dispersion, porosity, structural state). As a result of the interaction of water in the soil with mineral and organic parts, various forms of soil moisture are formed, which differ in soil retention and availability to plants [2].

Research methodology. The aim of the research was to determine the peculiarities of the accumulation of moisture reserves in the soils of Prydnisteria under different land uses. The study of moisture reserves available to plants in gray forest and black soil of Prydnisteria was conducted on arable land and meadows and forest (for gray forest). Systematically, during March-November, at the beginning of each month, field soil moisture was determined to a depth of 120 cm by the thermo-weight method in layers with the following calculations of moisture reserves and their estimation [3] and water constants. The humidity of wilting plants of the upper soil layer is 10.2% for typical chernozem and 8.6% for gray forest soil. Typical chernozems are of heavy loamy granulometric composition, medium humus. Gray forest soil is heavy loamy, low humus. Meadow and forest areas are located in close proximity to arable land on similar relief elements.

In terms of precipitation, the vegetation period of corn was covered by 30-35% (from 35 to 100% by month: May - 33%, June - 83%, July - 98%, August - 35%, September - 90%). It is worth noting the period from May 10 to June 10 with no precipitation and low soil moisture content.

Nevertheless, during the critical period of laying the number of rows of grain and the number of grains in a row (approximately from mid-June to July 1-5), precipitation was evenly distributed at the level of 85-100% of the supply. That is, there was no lack of moisture for plant growth and development during this period.

During the grain filling period, there was a lack of moisture, as significant precipitation fell only on July 26 (14 mm), August 6 (11 mm) and September 3 (14 mm), and in between the rainfall was 2-5 mm (respectively, the coverage of the norm was up to 50%).

Productive moisture reserves varied from 109 to 157 mm during the growing season. According to the assessment of the amount of moisture reserves in the meter layer by month, only in early June there was an average supply, and at the beginning of all other months there was a good supply. The upper soil layer (0-20 cm) is more dynamic in terms of moisture reserves - from 14-16 mm in early September and June, respectively, to 38 mm in early July.

In September 2023, the first and third ten-day periods were without precipitation, while the second ten-day period received only 12 mm (23% of the norm). In October, precipitation was not evenly distributed over ten-day periods: the first ten-day period was without precipitation; the second - 25 mm (68% of the norm); the third - 20 mm (50% of the norm). That is, the precipitation supply was less than normal, which did not contribute to the accumulation of soil moisture reserves.

In gray forest soils, moisture reserves in the meter layer were also within the limits of sufficient supply. However, at a depth of 30-60 cm, during the periods of precipitation (late June-July and mid- to late September) and in the immediate following decade, increased moisture content was observed compared to other soil layers. This indicates the presence of gleying at the boundary of the illuvial and humus-eluvial horizons. In the arable layer, no signs of this process were found.

The top layer of the soil experienced a greater loss of moisture reserves compared to typical chernozem up to low supply.

Soils under meadow vegetation had lower moisture reserves in summer compared to arable soils. This is obviously due to a greater loss of moisture due to transpiration. Forest soils, compared to soils under perennial grasses and arable land, had less dynamic moisture reserves in the meter layer. In the upper layer, moisture was retained for a longer time due to less physical evaporation from the soil surface (factors: fragmented forest litter with a mulch effect; protection of tree crowns from sunlight; higher relative humidity than in the field). Also, the delay of downward moisture movement by the illuvial horizon was less pronounced due to increased drainage by plant roots. Similar changes were found in gray forest soils earlier [4].

Conclusions. 1. In 2023, the moisture reserves of typical chernozem and gray forest soil in Prydnisteria were generally good for crops, including corn. The topsoil was more dynamic. 2. In soils under herbaceous vegetation, moisture reserves were lower than in arable land due to higher transpiration. 3. The gray forest soil under arable land had higher moisture content above the illuvial horizon, indicating waterlogging; the soil under the forest had better drainage due to tree roots and no evidence of overmoistening.

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NITROGEN STABILIZATION IN DARK GRAY SOIL UNDER HIGH DOSES OF MINERAL FERTILIZER IN THE WESTERN FOREST STEPPE

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Urea and ammonium nitrate are the most widely used nitrogen fertilisers for various crops, with annual demand forecast to increase by 1.5-2% in the coming years.