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ROLE OF EARTHWORMS IN SOIL FORMATION

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Annotation: Soil is a necessary component of nature. The main property of the soil - fertility depends on the interaction of the components of inanimate and living nature. Earthworms play a big role in the soil - in addition to collecting humus, they also take an active part in the processes taking place in the soil. The fact is that processes of decomposition and oxidation take place in the soil under the influence of soil microbes, during which mineral substances are released, which feed the roots of plants.

Keywords: soil, fertility, earthworms, ecology, products.

Introduction. Many summer residents are thinking about ways to increase soil fertility in their area in order to get a good harvest. The most common method is the application of mineral fertilizers. It's convenient and doesn't take much time. But this method of increasing fertility requires knowledge of what and when to apply, as well as in what quantities. An excess of fertilizer can harm both plants and soil. In addition, funds are needed to purchase fertilizers. Therefore, I was interested in the question of whether it is possible to increase soil fertility in a natural way without special costs. Today, this is a topical issue for many people involved in the cultivation of environmentally friendly products [1].

A huge number of various organisms live in soils, providing its loose structure and fertility. Most often, people do not pay much attention to them, and sometimes they do not notice them at all. Do they benefit the soil or just live there?

The surface of most of the land is covered with soils. Soil properties (along with climatic conditions) determine the possibility of their settlement by one or another vegetation, and the latter, in turn, determines the nature of the population of animals living in the soil and on its surface in a given land area. Thus, the soil is in full measure the “basis of life”. The presence of fertile soils is also a necessary prerequisite for the emergence and development of agriculture and animal husbandry. The formation of soils from rocks and the change in the properties of already existing soils, soil formation, is a set of processes that began simultaneously with the emergence of land and have been going on continuously everywhere to the present. The first stage of the process of soil formation is carried out by the forces of inorganic nature: the sun's rays, which cause uneven heating of rocks, atmospheric air and water are the main geological factors of soil formation. But in parallel with this, biological factors act and gradually come to the fore. It is now generally accepted that the soil is an integral complex of mineral and organic substances with living organisms. The totality of the results of the vital activity of soil organisms constitutes a complex of biological factors of soil formation. A special role belongs to earthworms.

Making passages in the soil, earthworms loosen it and contribute to the penetration of water and air into the soil, which are necessary for the development of plants. The mucus secreted by the worms sticks together the smallest particles of soil, thereby preventing its spraying and erosion. Dragging plant residues into the soil, they contribute to their decomposition and the formation of fertile soil [2].

Earthworms are most active in the warm season. In winter they hibernate. Freezing temperatures kill the worms instantly, so they must burrow deeper into the ground, where low temperatures do not penetrate. In the spring, when the temperature reaches a suitable value and the earth is saturated with rainwater, earthworms begin to multiply very quickly, producing about a hundred young worms per year.

Earthworms are the dominant species of soil invertebrates and make up 50–72% of the total soil biomass. There were up to 1–200 million earthworms per 1 hectare of well-groomed meadows and pastures (before chemicalization) (about 20 million on average). Thus, the biomass density of worms is 2–5 t/ha, which is almost 100 times higher than the biomass density of terrestrial animals.

Earthworms (lat. Lumbricina) belong to the class of low-bristle, or oligochaetes (lat.). They have a body 10-16 cm long. The body of an earthworm consists of segments - rings. The number of segments is from 5-7 to 600. On Each segment has four pairs of setae: two dorsal and two ventral. The bristles are so small that they can only be detected by touch, by running a finger from the back of the worm's body to the front. These worms need them when moving in the soil: bent from front to back, they help the worm to stay in the hole and quickly move forward. Under the epithelium is a developed musculature, consisting of circular and longitudinal muscles. Due to the alternate contraction of these muscles, the body of the worm can contract and lengthen, which facilitates the movement of the worm in its habitat [2].

In an earthworm, the digestive system consists of well-defined sections - the pharynx, esophagus, goiter, muscular stomach, middle and back intestines. The mouth is located at the front end of the body of the earthworm; the anus is in the back.

Earthworms feed on rotting plant debris, including fallen leaves, which they drag into their minks.

The muscles of earthworms work actively and therefore require a lot of nutrients and oxygen, which blood brings to them. The nervous system of the nodal type ensures the coordinated work of the muscle layers associated with the burrowing, motor, food and sexual activity of the earthworm.

The respiratory system of the earthworm is absent. Absorption of oxygen is carried out through the surface of the body. The sense organs of the earthworm are absent, but there are tactile and light-sensitive cells scattered over the entire surface of the body and allowing the earthworm to feel the touch of the body wall and the change in illumination. [one]

The earthworm lives in moist, humus-rich soil. It feeds on organic matter, passing earth with plant debris through the intestines. During the day, earthworms stay in the soil, making passages in it. In dense soil, the worm can eat its own way, passing the earth through the intestines. Lumps of soil can be seen on the surface of the soil - they are left here by worms. After a heavy rain that flooded their passages, the worms are forced to crawl out onto the surface of the soil (hence the name - rain) [2]. In summer, the worms stay in the surface layers of the soil, and for the winter they dig minks up to 2 meters deep. Earthworms live relatively long lives. Some manage to live for about ten years if they do not become victims of birds and moles. Another threat to their lives is the pesticides so widely used in horticulture today.

Earthworms are large invertebrate soil animals that feed on plant debris. There are about 87 species of them in the soils of our country [3].

Passing dead plant tissues through themselves, the worms destroy them, digest them and mix them with the ground. Rummaging in the ground, they absorb not only humus, but also bacteria, algae, fungi with their spores. Absorbed representatives of soil microflora and microfauna are digested in the digestive tract of worms and are practically absent in excrement (coprolites). But they contain a huge amount of bacteria from the intestinal microflora of the worm. Vitamins, enzymes and minerals contained in humus are returned to the soil, making it more fertile [4].

The very presence of earthworm passages in the soil changes its properties. It is quite clear that the more earthworms make moves in the soil, the more favorable conditions will be created for the

penetration of air and water into it. Air and water are indispensable conditions for the life of soil organisms, primarily bacteria and fungi, whose activity plays an outstanding role in supplying the root systems of higher plants with the substances they need. In addition, cavities in the soil, of various origins and various sizes, are the main habitats for various groups of small soil animals that take part both in the manufacture of humus and in its further processing [5].

Through the passages of the worms, not only air, water and plant roots penetrate into the deep layers of the soil: the walls of the passages and the adjacent areas of the soil are populated by microbes and other soil organisms; the passages of the worms serve as conductors of life deep into the soil.

In the literature, you can find enough information about the structure of the earthworm, but the role that earthworms play in agriculture is considered insufficiently studied. For example, manure in soils devoid of earthworms can lie for years without rotting or mixing with the soil, and not only does not improve the soil, but even worsens it [6]. In order to evaluate how important the presence of earthworms in the soil is, and what role they play in its mixing, we decided to verify the results of the following experiment.

Conclusion. Earthworms, moving in the soil, are involved in mixing its layers. Feeding on plant residues on the surface of the soil and swallowing them along with the earth, earthworms drag fallen leaves from the surface. Small lumps-granules appear on the surface of the soil, and the passages of worms are clearly visible throughout the entire container of the jar. Through such tubules, air and water will better penetrate into the soil, and lumps will make it looser. This will improve the physical properties of the soil.

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