ISSN NO: 2771-8840
Date of Publication: 18-01-2024

History of biohumus and its importance in soil fertility

Akhmadjon Nasritdinov[1]
Sh.Dadaxanov[2]
Oybek Abdumalikov[3]
Namangan Institute of Engineering Technology

Abstract. In the article, a detailed introduction to the promising direction in the field of increasing soil fertility, a real life ointment for the soil, the history of biohumus and its importance in soil fertility and ways of its implementation, the number of nests and the area where they are placed, the number of nests on the preparation and production technology of the California red earthworm and knowing the approximate amount of worms in them, after calculating the required amount of nutrients, bringing it to the specified area and placing it according to the preparation method, high-quality biohumus was obtained
Key words: soil and water, respiratory organs, endocrine systems, soil fertility, earthworms, earthworm hybrids, California red earthworm, biomass.

Introduction. As a result of the old methods of agricultural management, which only verbally recognized the importance of increasing soil fertility, and in practice, the increasingly intensive use of artificial chemical fertilizers led to the soil getting used to chemicals. The unpleasant complications of this situation are well known to all of us today.

According to medical experts, babies in the CIS countries are born with defects in the liver, kidneys, spleen, stomach and other internal organs. This indicator is even worse for the population of the republics of Central Asia. Recently, the use of nitrogen fertilizers, which accelerate the development of plants, has become increasingly popular in agriculture. Yes, indeed, thanks to such fertilizers, fruits and vegetables grow quickly and become beautiful. However, the negative side of this type of fertilizers is that they accumulate harmful nitrates in the fruit more than normal. Nitrates are known to have a destructive effect on any living tissue.

Contamination of soil and water bodies with toxic chemicals has had sad consequences. The number of respiratory organs, endocrine systems and cardiovascular system organs, liver diseases, the birth of mentally retarded children, malignant tumors and women's diseases is increasing sharply.

After that, it became clear that it was impossible to go this way. But what to do? Since ancient times, the wealth of a farmer has been determined not by the expensive things in his household, but by the quality of the food grown on his land. Even today, the whole world community pays great attention to the food grown on his land. if so, the product is sent back to the country where it was produced.

What is the solution to this problem in developed countries? It is known from the analysis of the literature that earthworms consume and recycle the waste (manure, plant residues) that fell on the plow, and produce an invaluable product for the soil - biohumus. And the productivity of the soil is determined by the amount of this same humus. Scientists, experts and farmers of almost all developed countries are convinced that it is useless to try to balance humus deficiency in the soil by applying large amounts of mineral fertilizers. Life examples, countless experiences testify that the way to salvation is not in the chemicalization of agriculture, but in the rational use of the miraculous creative forces of Mother Nature.

From the history of the use of earthworms, it has long been known that they have a positive effect on the productivity of the soil. The role of earthworms in soil formation was first noticed and described by English naturalist Gilbert White. As early as 1789, he put forward the very correct idea that without earthworms, the soil would be "cold" and "barren, unproductive." Other naturalists in Europe also wrote about the positive "activity" of earthworms.

The creation of the soil vegetation layer and observing their way of life" is the most perfect work.

By the middle of the 20th century, they began to use soil sacrifices in practice. The first farms specializing in the artificial reproduction of earthworms appeared in the United States in the late 1940s. However, in these farms, worms are not bred for humus, but as food for fishing. A few decades later, in a situation where the problem of excess nitrates in agricultural products in the USA was on the cross, scientists began to seriously think about the issue of artificial production of biohumus. The results of previous experiments were not

ISSN NO: 2771-8840
Date of Publication: 18-01-2024

satisfactory. In the late 1950s, a new hybrid species of earthworm was created in California called the California Red Earthworm. Since 1979, this type of hybrid worm has been widely bred industrially in Western Europe. By the end of the 1980s, 700 specialized sites for breeding red worm hybrids were established in the USA, 140 in Italy, 40 in France, and 30 in Germany.

The governments of these countries are farmers of earthworms-
provided them with preferential loans and grants and created the necessary conditions.

The Vladimir State Pedagogical Institute was the first in the CIS to start breeding earthworms in 1984. In 1985, at the Institute of Biology of the Kyrgyz Academy of Sciences, research was conducted on the processing of organic fertilizers using earthworms. At the experimental station of the Pamir Biological Institute of Tajikistan, the effect of earthworms on the processes of rotting and turning into humus of soil biomass was observed. It is a pity that this experiment and observations were only attached to scientific results - indicators, and were not implemented in practice.

Finally, in the late 1980s, practical work on industrial reproduction of earthworms began in the Fergana Valley. In 1989, the "Dostlik" collective farm in Khanabad, Andijan region brought 5 million Californian red worms. By March 1992, their number reached 5 billion.

Materials and methods. According to the technology of preparation and production of California red earthworm, the number of nests and the area where they will be placed are determined. Knowing the number of nests and the approximate amount of worms in them, the required amount of food is calculated and brought to the designated area. The brought biomass is washed with water three times in two weeks. The purpose of washing biomass is to get rid of the heat and toxic substances of urine.

It is spread thickly and the California red worm is placed in the middle of the biomass. If it is not well washed and cleaned, the California red worms do not enter the biomass. In this case, the California red worm is washed again and placed. The surface of the biomass is covered with straw, straw, and leaves. water is sprinkled 2-3 times a week. After the specified time, new biomass is placed on both sides of the biomass, California red worms will switch to new food for 1-2 weeks.

In winter, on frosty days when the cold comes, the building is heated, the temperature should not drop below 5-10 degrees.

In such buildings, it is possible to install two-three-story shacks for worms, as well as use special cages attached to racks. Areas or buildings designated for vermicompost production should be illuminated day and night. Because in the dark, worms crawl out of holes in all directions. A weak light emitted by an 80 W electric lamp on an area of 100 square meters is enough to prevent worms from crawling out of the substrate.

It is better to dig nests on land with a certain slope. This ensures that excess water runs off when it rains and prevents puddles from forming. The same applies if the ground is sandy or stony. Earthworms are afraid of the wind, so it is necessary to choose places protected from the wind.

Various buildings for humus processing and storage (sheds, warehouses, sheds, etc.) there should be bags, as well as wire, pitchfork, pitchfork, harrow, trowel and other work tools.

ISSN NO: 2771-8840
Date of Publication: 18-01-2024

Figure 1. Field prepared for obtaining biohumus

One of the important conditions for the reproduction of worms by the canoe method is to maintain a constant level of moisture in the habitat of the worms, as well as during the composting process. Practical experiments have shown that if the humidity of the substrate is maintained at the same level, then the fermentation (fermenting) process is normal, and the productive life of worms in the nests is ensured.

Worms are extracted from the substrate as follows. On the eve of hatching, worms are fed new food. Food should be enriched with new components. 5 cm from the old before laying the new substrate. thick surface layer is copied. After 6-7 days, another layer of the same thickness is transplanted, where 50-60% of the total number of worms live. The transplanted layer is placed in a new nest together with the worms. Instead of the moved layer, new feed is put. After 6-7 days, this layer is also moved. 25-35 percent of worms live in it.

Research results. These worms are also placed in the new nest along with the habitat. New food is placed on the vacated surface, and in about 6-7 days, the remaining worms fill the surface of the substrate. In this way, worms are extracted almost completely (95-97 percent) without any losses. Young worms born in the last few days may remain in the substrate.

The resulting vermicompost is slightly dried and the moisture content is reduced to 50-60%, since the moisture content of the fertilizer produced by worms is 80-82%. Humus is divided into varieties according to the following three groups: very soft, soft and granular. These three types of products are used in different fields.

ISSN NO: 2771-8840
Date of Publication: 18-01-2024

Figure 2. Prepared biohumus product

If the worms have been active for a certain time and have left the village, the nests are divided for the first time in April. Preparations will begin in March. Each nest bed divides into three new ones in April. If the worms in their nests have lived an active life during the whole autumn and winter period, that is, for 6 months, all the worms and humus in them are separated. Newly filled nests in April are made for separation in June, if the necessary conditions are created. The reason for this is that worms are more active in the spring-summer season, and the reproduction process is accelerated. The nests are separated in July and the humus layer is not removed, in general the technology of this process is slightly different from that in April. We said that the surface layer of the substrate is moved when separating the nests in April. And from the nests of July beds, only half of the width of the surface is copied. No new feed is added, as a result, after the substrate layer has been transplanted three times, one side of the nest is higher than the other by about 15 cm. After removing the worm layers, the surface of the substrate is leveled.

In October, the bed nests are divided for the third time, and the humus from the April nests is separated. During this period, the April nests are divided three times, and the July nests are divided four times. The next ones are left for the winter, divided in April, and the resulting humus is separated. Thus, the period of preparation of hummus will be 6 months.

When the worms are left in the open air, they are covered with straw, manure and polyethylene film. Nests with a height of 50-60 cm are 8-10 cm from frost. a thick layer of straw, then a 20-30 cm layer of crushed straw and mixed manure and on top of that it is protected by a layer of straw of the same thickness.

Experiments show that with the help of earthworms it is possible to turn organic matter into biohumus, which can be quickly absorbed by plants. A valuable feature of biohumus is that it is resistant to water washing away with its granular structure. Biohumus contains ten times more plant nutrients. For example, if 500 head of cattle are kept in a livestock farm, 200 hectares of land can be fed with manure. If this amount of biomass is used for the production of biohumus, it is possible to feed 1000 hectares of land. Biohumus can also be applied to vegetable and paddy fields to obtain an environmentally friendly product.

Concluslons. The role and importance of California red worms is that their activity is increasing day by day and allows us to process various wastes that pollute our environment, such as livestock waste, household

ISSN NO: 2771-8840
Date of Publication: 18-01-2024

waste, sewage sludge, etc., and use them as organic fertilizers in agriculture. This type of organic fertilizer production does not require large investment and operating costs. It is advisable to use the activity of worms and microorganisms in the processing of household waste and handicraft industrial production residues in residential areas. It is known from the experience of foreign countries that with the help of earthworms, any organic residues can be turned into extremely nutritious fertilizers rich in useful nutrients for plants, with a granular composition, which does not dissolve or wash away under the influence of water.

List of references used

1) Abduhamidovich, Nasritdinov Ahmadjon. "MANGOSTIN DARAXTI VA MEVASINI TIBBIYOTDA FOYDALANISH." *Journal of new century innovations* 28.2 (2023): 12-14.
2) Abdukhamidovich, Nasritdinov Akhmadzhon, and Numonov Otagek Urmonovich. "The Results of Theoretical Studies of the Chisel Cultivator Rack Frontal Surface Shape." *Annals of the Romanian Society for Cell Biology* (2021): 5930-5938.
3) Abdukhamidovich, Nasritdinov Akhmadzhon, Muhabbat Davlatova Urmanovna, and Numonov Otabek Urmonovich. "Strip Till Age of Soil for Deuteric Sowing (Second Crop)." *International Journal on Orange Technologies* 3.4 (2021): 71-74.
4) Насритдинов, Ахмаджон Абдухамидович, and Хусниддин Тургунбоевич Киргизов. "Агрегат для полосной обработки почвы." *Современные научные исследования и инновации* 12 (2015): 412-416.
5) Лабух, Владимир Михайлович. "Определение площади поверхности скола стружки ярусным глубокорыхлителем." *Техника в сельском хозяйстве* 2 (2011): 37-38.
6) Насритдинов, Ахмаджон Абдухамидович. "Результаты исследования формы лобовой поверхности стойки чизеля-культиватора." *Universum: технические науки* 1 (58) (2019): 18-20.