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Omonjon Nomonovich Sulaimonov
Fergana Polytechnic Institute
Associate Professor
Ferghana city, Uzbekistan

Mokhirakhon Lutfullaevna Zokirova
Fergana Polytechnic Institute
Master student of Year 2
Ferghana city, Uzbekistan

ROLE OF CALIFORNIAN RED WORM IN BIOHUMUS PREPARATION

Abstract: *The article discusses the role and importance of Californian red worms in biohumus production and the impact of biohumus on crop yields. The author of the current article consider that biohumus has biostimulating properties, contains the necessary proportions of substances necessary for plant growth and development and is rich in various biologically active compounds.*

Key words: *biohumus, crop yields, biological, active compounds, productivity, soil porosity, increase, consume, organic, matter, essential.*

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Introduction

The California red worm Eisenia andrei (Bouche, 1972) has been bred in Uzbekistan for the last few decades. One of the most pressing problems in agriculture is the production of additional products by improving the quality of degraded land and increasing its productivity. Worms in the soil process organic matter into a form that is easily 'digested' by plants, increasing soil porosity and improving the physical and chemical properties of the soil. The result is a dramatic increase in productivity.

The formation of humus is a complex chemical process in which organic matter is broken down not only into simple compounds but also into compounds that are essential for plants. Worms consume organic matter (humus, manure, vegetable and fruit residues, fallen leaves, etc.) and enrich it with biologically active substances in a gut transplantation process, making the worm waste or caprolite necessary for good plant development which becomes an invaluable biohumus. The content of micro- and macro nutrients in this biohumus is in necessary proportions for plant growth and biologically active substances it contains increase the yield of crops. Biohumus is 15-20 times more effective than any organic fertilizer [1,2]. Vermiculture (biohumus extraction) was first introduced in 1959 at the University of California, USA, based on the cultivation of the Californian red worm. The California red earthworm differs from the common earthworm in its rapid reproduction, fecundity and longevity.

California red worms feed on humus, manure and organic waste. The worm's habitat should be soft, porous, with a humidity of 70%; the pH of the medium should be 6.5-7.5 and the optimum temperature should be 22-24°C. If the living conditions change drastically, their numbers will decrease. It takes 2-3 months from egg laying to sexual maturity. The average weight of the Californian red earthworm is 0.5 g, which transfers humus or manure equal to its own weight overnight, turning it into biohumus. If the worm weighs 0.5 g and assumes 50 pieces per m^2 (500,000 pieces per m^2), 250 kg of substrate will pass through the worm's gut in 1 ha per day. If we say that worm activity lasts for 200 days a year, then the amount of substrate that passes through the worm's gut

and is processed is up to 50 tonnes. This shows that worms are a powerful force in improving soil quality.

'California red worm' is grown in flat-bottomed, concrete surface, 1 m wide, 6 m long, 0.6-0.7 m high piles. "California red worm" can be grown in layered metal or wooden boxes and on the floor in 1 m wide, 10-15 m long and 0.5-0.7 m high piles. Manure from livestock farms was introduced outdoors to rot the worms so that they could be 'eaten'. Leaves and straw residues from trees were used to stabilise the environment. To determine the pH of the environment, the manure was liquefied and immersed in litmus paper and the pH was determined by comparing it with standard colours according to the change in colour of the paper.

In addition, the substrate was manually compacted to determine the moisture content. If a few drops of water were released, the humidity was considered sufficient. The temperature was measured with a thermometer in several parts of the room. The result was a pH of 6.5-7.5 in the cells; the substrate moisture content was about 70%. A small amount of paper and about 5% biohumus was added to the substrate to accelerate biohumus formation. After the substrate had been prepared as described above, the worms were placed in piles. First, 20-30 worms were placed per 0.5-1 kg of substrate. After the worms were dispersed in the substrate, the substrate was considered suitable for the worms. Thereafter, 20-25,000 worms were placed per 1 m^2 pile. Every 10-15 days, the substrate is placed 10-15 cm thick on the pile. One of the signs that "supplementation" is needed is that the worms begin to accumulate in the upper layers of the pile.

To maintain the moisture content of the pile at 70%, water is sprayed once a day, twice a day when the temperature is above 20° C. In practice, a small amount of water drips between the fingers when squeezing a small amount into the palm to determine the moisture content of the pile, and the moisture content of such a pile is about 70%. In a half-metre thick pile the worm density is at least 20-25 thousand per 1 m^2, and it takes 45-60 days for the biohumus to mature. The worms are then covered with 5-7 cm of substrate; within 2-3 days the worms transfer from the biohumus to the substrate, this layer is removed and placed in the prepared substrate pile. The remaining worms in the biohumus pile are collected again. Biohumus without worms is dried in the shade, passed through a large sieve and covered. The substrate was tested not only on the piles, but also on the sides.

The piles of worms were grown on a substrate up to three metres wide. On the other side, biohumus is removed. The spaces between the piles of worms were left for walks. As a result, biohumus formation and harvesting continued uninterrupted. In winter the indoor temperature of 17° C is good for worm development. Biohumus contains 3-4% nitrogen, 2-3% potassium, 4-5% phosphorus and in 20 years it will increase yields of cereals per hectare by 25-30%, melons by 30-35%, vegetables by 25-35%, potatoes by 45-55%.

In the first year of biohumus application, 30% of the usual amount of mineral fertilizer is applied to the soil, and in subsequent years mineral fertilizer may not be used.

Conclusion

In conclusion, biohumus has biostimulating properties, contains the necessary proportions of substances necessary for plant growth and development and is rich in various biologically active compounds. 5-6 % of biohumus is sufficient to increase soil fertility. Its bioactive substances are very effective for plant growth.

Useful properties of biohumus;

- according to composition theory, biohumus is 4-8 times stronger than other fertilizers;
- reduces the density of the soil;
- increases the fertility of the soil by 15-25%;
- enriches the soil with organic compounds;
- positively influences the soil microflora;
- significantly increases the number of nutrient micro-organisms;
- good moisture retention;
- consists of mechanically sturdy granules;
- increases plant growth by 11-24%;
- most importantly, the crop will be ready in 2 weeks.

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