METHOD OF APPLICATION OF BIOGUMUS AS WELL AS OBTAINING LIQUID BIOORGANOMINERAL FERTILIZERS FROM RAIN WORM BIOGUMUS

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Abstract: This term (Greek word for “bios”-liveliness, Latin for “hummus”- Earth soil) means. Biogomus is an organic fertilizer produced with the help of California red worm. Although it is known to everyone by the name of vermicompost, that is, worm compost, the process of forming a biogomus is quite simple. He eats earth worm skil and reproduces it mixed with various minirals and Fertilizers. And the processed product is called.

Keywords: biohumus, mineral fertilizer, California red worm, nitrogen oxide, phosphorus oxide, acids, ammonia.

The Biogomus contains 0.7-1.2% potassium, 0.3-0.5% magnesium, 2-3% magnesium, 0.8-2% nitrogen and a lot of phosphorus. Biohumus for seedlings also contains fulvin and humic acids. Only they are able to process the photon energy of the sun. Acids turn it into chemicals. In the soil, they secrete pathogenic bacteria (block). It is important for the development and life of plants. Fulvin acid gives cells the necessary nutrients, prevents swelling, eliminates toxins and viruses .

Many doctors are sure that one of the causes of any disease in general is fulvin acid deficiency. It can only be obtained from plants. Hence, liquid biogomus is not just a fertilizer, but a type of Medicine. For them, the substance is a growth stimulant of the root system. Having received food, it penetrates into the deep layers of the soil. Moisture can be obtained from them. This is useful during periods of drought. In normal soil, humic acid is found in an insoluble form in water. Plants only absorb solutions. It is possible to dissolve the substance from the biogomus.

One of the main problems facing agriculture in our country is the low coefficient of beneficial effects of mineral fertilizers. This is 60-70% for potash fertilizers, 20-25% in the first year for phosphorus fertilizers, and 40% in the last 2-3 years.

The next problem is related to soil humus, which is considered the basis of productivity in all soils. Humus plays an important role in the processes of improving the physical properties of the soil, creating a moderation of the water-air regime. It acts as an accumulator of soil energy, preventing mineral fertilizers from being washed out of it and thereby causing environmental pollution, as well as turning difficult soluble phosphorus compounds into a well-assimilated state. All this ensures the mobility of bound phosphates in the soil, which is 3 to 6 g of P2O5 per 1 m2 of arable land. This is a large stock of phosphorus, which at the moment has no benefit for the crop.

Biogomus is a quality organic fertilizer made from manure that can be applied to all agricultural crops. It contains 40-50 percent dry organic mass, 10-12 percent humus, 0.8-0.3 percent nitrogen, 1.3-2.5 percent phosphorus, 1.2-3.9 percent potassium, 4.5-8.0 percent calcium and other microelements.

Particular attention is currently paid to the production of fertilizers and plant development stimulants with humus substances in the composition using organic resources and their application in agriculture, due to the fact that humus substances in the composition of fertile soils are decreasing. In this regard, the development of technologies for obtaining Humic fertilizers and stimulants, which are necessary in increasing the fertility of soils, is one of the urgent tasks.

In our republic, a certain level of scientific results has been achieved on the processing of the oxidized form of Angren coal into organomineral fertilizers [1]. In this regard, it is important to establish the production of liquid bioorganomineral fertilizer using rain worm humus as a source of raw materials. In order to fill the gap in the field of bioorganomineral fertilizers in crop production by Topchilab irrigation and hydroponics method, a technology for the production of liquid bioorganomineral fertilizer was created on the basis of rain worm biogumus.

The principle technological scheme for the production of liquid bioorganomineral fertilizers is shown in Figure [1].

A reactor with an external heater (30-35^{o}C) is fed 5000 kg of water and 500 kg of sifted and crushed biogumus, and a suspension is formed by mixing. Here 50 kg of nutrient medium (sugar, patoka and sh.k.) is also added. The ratio of biohumus to water is 1:10. To ensure regular mixing of the biohumus with water, a rotary engine and a stirrer are fixed on the reactor axis of its rotation. The speed of rotation of the mixer is 180 ayl/min, The temperature in the reactor water mask is kept at 30-35$_{o}$C.

The mixture of biogumus with water is mixed in the reactor for a period of 40 minutes. At the same time, air is supplied to the reactor using a compressor for water separation aeration from the biogumus for 120 minutes. When the aeration is finished, the mixed suspension of the biogumus is held in the reactor, where it is infused for 2 hours. The clarified bacterial separation above the precipitate is transferred from the reactor to the Collector (image 2) using a pump.

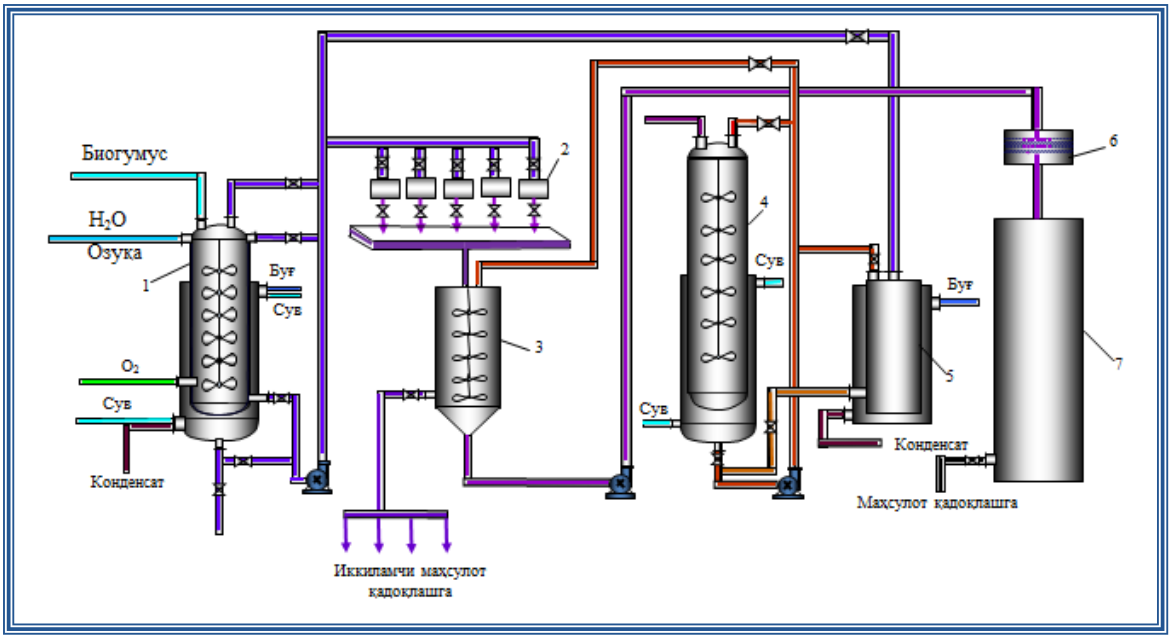

Figure 1. Principled technological scheme for the production of liquid bioorganomineral fertilizers from rain worm biogumus:

1-reactor; 2-bacterial separation aggregator; 3-liquid bioorganomineral fertilizer preparation mixer; 4-alkaline extracts neutralizer; 5-collector-clarifier; 6-Filter; 7-finished product warehouse.

5000 kg (in a ratio of 1:10) of boiling water (70-80oc) is added to the residual precipitate in the reactor (image 1). The water temperature in the reactor mask is also delivered to 70-80°C. Then 35 kg (in a ratio of 1:0.07 compared to biogumus) of nitric acid is added to the suspension in the reactor, and the process takes 2 hours with regular stirring. Then the decantation process is carried out-the clarification and extraction of nitric acid solution from the biogumus, and then the acid separation above the precipitate is transferred from the reactor to the Collector-clarifier (image 4) using a pump.

5000 kg (in a ratio of 1:10) of boiling water (70-80°C) is added to the residual precipitate in the reactor (image 1). Then 25 kg of sodium Alkali (in a ratio of 1:0.05 compared to biogumus) is added to the suspension in the reactor, and the extraction process is carried out for 2 hours with regular stirring. In this case, the extraction of humic acids from the biohumus to the aqueous solution occurs.

Then the decantation process is carried out-the clarification and extraction of the first alkaline solution from the biogumus, and then the alkaline separation on the precipitate is transferred from the reactor to the Collector-clarifier (image 5) using a pump.

Boiling water (70-80oc) is added to the precipitate in the reactor in a ratio of 1:10 from the heater. During the extraction process for 2 hours, the mixer is carried out periodically and 160-200 kg (in a ratio of 1:0.06 compared to biogumus) and 1:0.3-0.4) of cornflower ash are added as a reagent for the complete extraction of humic acids. The extraction process takes 2 hours, stirring regularly. In this case, a complete extraction of humic acids from a biohumus to an aqueous solution occurs.

Then, after a 2 – hour clarification process, the decantation process is carried out-the clarification and extraction of the second alkaline solution from the biogumus, the purified alkaline separation above the precipitate is transferred from the reactor to the Collector-clarifier (image 5) using the pump.

The mixture of alkaline separations in the Collector-grinder (image 5) is cooled naturally to a temperature of 20-30oC. The cooled alkaline solution is transferred to the Collector (image 4), as a result of which part of the alkali is neutralized with nitric acid in the Collector.

The acid-alkaline mixture in the Collector (image 4) is neutralized by adding small-small shares of mineral acids until the pH-medium reaches 8-9 with regular stirring, resulting in a neutralized alkaline separation. As a Mineral acid, thermal phosphate acid or extractive phosphate acid purified from foreign additives (fluorine, sulfate and other) is used.

To obtain liquid bioorganomineral Fertilizers, a mixture of a bacterial separation in a collector (image 2) and a neutralized alkaline separation in a collector (image 4) is mixed in a 1:6 ratio in a collector (image 3).

The finished product is passed through a 20 μm hole filter (image 6) and sent to the finished product warehouse (image 7) or to the consumer.

After the completion of the cycle, the semiconductor precipitate, which remains in the reactor, collectors (Images 1, 4 and 5), is transferred to a separate container. It can also be used later as a solid organomineral fertilizer [2-30].

The rheological properties of alkaline extract and liquid bioorganomineral fertilizer extracted from biogumus are shown in Table 1.

Table 1

Rheological properties of alkaline extract and liquid bioorganomineral fertilizer extracted from biogumus:

Temperature (t), ^{0}C	**Alkaline extract**		**Liquid bioorganomineral fertilizer**	
	density (ρ), г/см^3	**viscosity (η), сПз**	**density (ρ), г/см^3**	**viscosity (η), сПз**
25	1,0246	1,06	1,0150	1,05
30	1,0223	0,96	1,0135	0,95
40	1,0175	0,83	1,0102	0,81
50	1,0131	0,73	1,0070	0,72
60	1,0090	0,66	1,0037	0,64
70	1,0047	0,61	1,0000	0,58
80	1,0007	0,58	0,9963	0,54

Biological humus is a fertilizer that surpasses ordinary compost and manure in composition and nutritional value. Adding to the soil in a ratio of 10-20% to its total volume allows you to improve the soil that has dried up or contains a large amount of salts. During processing, there is a complete disinfection of organic masses, their purification from helminth eggs. Biohumus contains many useful components in an optimally balanced form:

Mineral elements in the form well absorbed by plants.

Enzymes. They ensure the transformation of organic residues into nutrient compounds.

Substances that prevent the reproduction of pathogens.

Phytohormones. They improve plant growth and stress resistance.

This type of environmentally friendly fertilizer contains 4-8 times more humus than compost from cow dung or plant residues. Among its advantages are good moisture capacity, fragility, compatibility with other types of organic fertilizers, there is no need to spend large energy consumption during the production and application process. The possibility of selling surplus products allows you to cover expenses and receive a certain income. Thus, by mastering this technology in the conditions of industrial production, it is ensured to satisfy the demand of agro-industrial enterprises for effective liquid bioorganomineral fertilizers with unique consumer properties. These fertilizers are characterized by high quality, can be stored for a long time, used for drip irrigation and hydroponics, and show high export potential. The product is highly cost-effective, with high added value and agrochemical efficiency.

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