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## INFLUENCE OF ORGANIC FERTILIZER (BIOFERTILIZER) OBTAINED AS A RESULT OF ANAEROBIC PROCESSING ON SOIL FERTILITY AND GERMINATION OF COTTON SPROUTS

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### ABSTRACT

*This article provides information on the success of feeding cottonseed with biofuel from renewable bioenergetic devices. Information on the composition of biofuel and the effectiveness of feeding cotton. The pace of acceleration of agriculture has significantly increased in recent years in the country. However, in order to obtain high yields from plants, the use of mineral fertilizers was forced, and attention to the natural development of the soil was reduced. Thus, with the use of organic fertilizers, along with the increase in cotton yield, soil fertility also improves, and the rate of mineral fertilizers can be saved by 15-20 percent.*

**KEYWORD:** *Organic Waste; Biofertilizers; Local Fertilizers; Methane Bacteria; Biogas; Biogas Device.*

### 1. INTRODUCTION

The yield of agriculture depends on part of the assimilation of various substances in the soil, as a result of which the organic and mineral content of the soil decreases year by year. To restore soil fertility, it is necessary to regularly apply organic and mineral fertilizers [1]. These fertilizers must contain phosphorus, potassium, nitrogen, carbon and other substances necessary for plant growth and development [2].

Crops such as cotton and wheat are planted instead of natural plants. The demand of these crops for soil, as well as the amount and residue they leave in the soil, and the processes of their decay and humus, are completely different from those of natural plants. Microbes multiply in the soil and their type changes [3]. At the same time the microbiological and enzymatic activity of the soil increases. Increased biological activity of the soil leads to a change not only in the substances in the soil humus, but also in the interactions.

Plant growth and yield are inseparable from soil fertility, its properties, in many respects determine the biological circulatory movement of substances and, consequently, affect soil properties. Plants need a lot of nutrients during the short growing season and get them mostly from the soil. However, most of these elements do not return to the soil, but leave the biological cycle with the crop [1, 4]. Therefore, the soil in which cultivated plants grow must have a reserve of nitrogen, phosphorus and other nutrients.

Nitrogen, phosphorus, potassium and some trace elements are added to the soil as fertilizer. Even in gray-oasis soils with high fertility between irrigated soils, it is possible to grow 12-15 ts of cotton in the natural state without mineral and organic fertilizers. When mineral fertilizers are applied to the soil, the yield can reach 30 ts and more.

The pace of acceleration of agriculture has significantly increased in recent years in the country. However, in order to obtain high yields from plants, the use of mineral fertilizers was forced, and attention to the natural development of the soil was reduced. As a result, the soil's fertility potential began to decline. The organic matter removed from the crop caused a decrease in the amount of humus, nitrogen and other nutrients in the soil.

## 2. Methods

Humus is an important factor in determining soil fertility, but in recent years, as a result of dehumidification in the soil, humus in the soils of cotton-growing districts of Uzbekistan has decreased by 40-50%, resulting in deterioration of soil biological activity and soil compaction. Soil compaction leads to deterioration of its air, water, heat regime, reduced activity of microorganisms, resulting in a decrease in soil fertility. The data obtained showed that the plant develops well only when the soil density is up to  $1.4 \text{ g / sm}^3$ .

The amount of humus, nitrogen, phosphorus, potassium, sulfur and a number of trace elements in the soils of farms, which cover the annual planting of cotton, cereals, fruits, vegetables and melons with organic and mineral fertilizers, replaces the nutrients removed from irrigated soils. on the contrary, there is a decrease in soil fertility in farms that are not replaced. Therefore, the proper use of organic and mineral fertilizers is of great importance in increasing the level of fertility of irrigated soils and increasing the productivity of agricultural crops. Therefore, special attention should be paid to the application of organic and mineral fertilizers. This includes non-traditional fertilizers (bentonite, glauconite, vermiculite, river deposits, coal industry, cattle manure and municipal waste) and composts based on them, as well as high-quality organic fertilizer (biofertilizer) from animal manure processed in a biological gas plant. The application is of great practical importance [5, 6, 7, 8].

### 3. RESULTS AND DISCUSSION

In recent years, the supply of organic fertilizers to agriculture in the world, including in our country, remains a problem. This is due to the fact that in order to maintain the humus balance in Uzbekistan without deficits, 18-20 tons of organic fertilizers should be applied per hectare of irrigated land annually. For that reason, anaerobic processing of agricultural, livestock and chicken manure to prepare high-quality organic fertilizers is the most effective way to use them profitably and solves two problems at the same time; firstly, the problem of organic fertilizers, and secondly, the issues of protection of the environment from waste pollution will be solved [9, 10]. The efficient use of such wastes through the preparation of organic fertilizers and plays an important role in regulating the balance of nutrients in agriculture, the participation of nutrients in the metabolic chain of waste. [11, 12].

Organic fertilizers (biofertilizers) obtained as a result of anaerobic processing were used in low-yielding lands in cotton, potato and corn crops, their effect on soil water-physical and agrochemical properties and nutrient uptake, plant nutrition, growth, development and productivity were studied. (Figure 1).



**Figure 1. Planting and development of potatoes with biohumus.**

One of the peculiarities of irrigated soils in the country is their low content of organic matter (humus) and nitrogen. According to scientific data, the cotton plant meets its nitrogen requirements by 60-70% due to nitrogen in the organic part of the soil and 40-30% due to mineral nitrogen fertilizers.

The results of a number of experiments show that the content of organic phosphorus in the biofuel is up to 0.2... 0.5%, potassium up to 0.4... 0.9%, magnesium up to 0.08... 0.3% and iron content up to 28... 400 mg. / kg increase [13, 14]. In addition, the initial nitrogen content in the organic waste processed in the anaerobic process is fully preserved.

As mentioned above, the presence of large amounts of organic matter in the biosludge not only improves the hygroscopic condition of the soil, but also improves its absorption of moisture and water, thereby preventing soil erosion and increasing soil fertility (Figure 2,3).

Recycled organic fertilizer (biofertilizer) improves the physical properties of the soil when applied to the soil.



**Figure 2. Planting with biohumus under cotton seeds.**



**Figure 3. The state of development of cotton seedlings in the field planted with biofuel.**

The fact that the protein and lignin in the biomass do not occur freely among the chemicals indicates how much it is necessary for the plant world, when it is placed in the soil, it begins to be assimilated by plants and affects the yield for 3-5 years longer than mineral fertilizers. It is known that humic acids are the main raw material for plant growth and are one of the main factors in increasing their rapid maturation and productivity. The content of humic acids in the biomass is 13% - 28%, depending on the processing temperature, relative to the dry organic matter. There is a lot of information that it increases the yield from 10% to 70% when the crop is planted.

#### **4. CONCLUSION**

Thus, with the use of organic fertilizers, along with the increase in cotton yield, soil fertility also improves, and the rate of mineral fertilizers can be saved by 15-20 percent. According to many scientific studies and data obtained from advanced farms, the effectiveness of mineral fertilizers in cotton increases when they are used in combination with organic fertilizers. If organic fertilizer (bioslam) is applied to the soil along with the seeds during sowing, the cotton can produce early, slender, healthy seedlings. Due to the application of organic fertilizers (biofertilizer), the soil temperature at the depth of sowing increases by 0.2-0.5<sup>0</sup>C, soil moisture by 1.0-1.5%, and full germination of seedlings is achieved.

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