

SUSTAINABLE SOLUTIONS FOR ORGANIC WASTE MANAGEMENT

Kuzmin K. S., wikihow711@ukr.net

Dmytro Motorny Tavria State Agrotechnological University

Waste disposal problem is relevant due to the trend towards the agglomeration enlargement, concentration of most of the population in cities and accumulation of various types of waste at dumps. Different types of organic and inorganic waste products require colossal energy costs for their recycling or disposal. Waste management may or may not include waste recycling – process of converting the physical, chemical or biological state of waste to provide subsequent waste management activities. Currently, the biological, thermal, chemical, mechanical and mixed methods of organic waste utilization are used.

Taking into account the necessity to ensure the environmental and energy security of Ukraine it is especially important to study the sustainable prospects for biological recycling of organic waste in order to obtain useful products – compost and biogas. According to the latest research, scientists have found a solution to the task of the rational method of allocation, construction of production of facilities with special equipment for waste disposal.

Biogas plants are becoming more and more popular in the development of renewable energy sources in Europe, and more recently in Ukraine [1]. Biogas, a product of these plants, is valuable for its high methane content. Biogas is used instead of the natural gas (providing the necessary equipment has been remodeled) for combustion in thermal or power generating plants. The garbage disposal start can be a trivial term, nevertheless, it has been proved that waste transporting increases of unpleasant odors, as well as the levels of emissions. The possibility of using technological pyrolysis within one hour at high temperatures and insufficient air supply causes the decomposition of the object into its component parts.

In Ukraine, the green tariff has the highest price rate, so owners of biogas plants can get more profit from energy supply [2]. In addition, environmental-friendly electricity ensures independence from the central network and prevents emergencies caused by its disconnection. A promising by-product of the biogas complex is the production of organic fertilizers. In this context, it is necessary to include in this complex agricultural enterprises for mutual benefit.

Biogas is a renewable energy source and can replace expensive natural gas in heating systems or power generators. Biogas complexes use biomass as feedstock produced from industrial waste. Thorough analysis, preparation of mixtures and adherence to technological regimes make it possible to obtain biogas with a high methane content. Thus, the disposal of waste by processing it into biogas allows you to:

- get rid of the costs of waste disposal;
- improve the environment by recycling waste;
- get an additional resource in the form of heat;
- receive energy sale revenue;
- receive income from the production of fertilizers.

Composting as a recycling method is proper for the disposal of organic substances such as paper, vegetable residues, food waste. The composting process consists of creating special clusters that are subject to turning over at a certain time interval. The mentioned above strategy is substantiated by the need for obtaining data and processing the observation results. The product obtained by natural decomposition of organic components is used to enrich the soil while plowing, planting seedlings or seeds. This method can be used by companies whose work is related to the production or processing of organic raw materials or by private landowners. The composting method improves the ecological situation in soils. Using this process, organic household waste can be not disposed of in common landfills but utilized and converted into organic fertilizers for soil. Basically, composting is a solution to two problems simultaneously. At the local level, it is possible to get rid of most organic residues and to get nutrient soil for flowers or vegetables for free [3].

Therefore, recent studies show methods of composting organic waste that allow not only to reduce environmental pollution from waste, but also to obtain valuable organic fertilizers – compost and protein feed. Among the recommended methods there are other cost-effective processes for the disposal of organic matter, harvest waste (cereal straw, cobs and stalks of maize, sunflower heads), as well as waste from the sugar and oil and fat industries. It is expedient to use such waste as a forage for animals or birds and also to manufacture from waste useful and eco-friendly products like cellulose, paper, cardboard, oil, yeast or citric acid in an environmentally sustainable way. Innovations that would deal with disposal and recycling are demanded in Ukraine. Current regulatory uncertainties in the field of waste management, which is a new sphere in Ukraine, can be overcome; legislative work aimed at their elimination is underway.

References

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Scientific adviser: *Zaitseva N V., Senior Lecturer, Department of Foreign Languages, Dmytro Motorny Tavria State Agrotechnological University.*