

Міністерство  
освіти і науки  
України



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Національний університет біоресурсів і  
природокористування України  
Механіко-технологічний факультет

Представництво Польської академії наук в Києві  
Відділення в Любліні Польської академії наук  
Академія інженерних наук України  
Українська асоціація аграрних інженерів



***ЗБІРНИК ТЕЗ ДОПОВІДЕЙ  
II МІЖНАРОДНОЇ НАУКОВО-ПРАКТИЧНОЇ  
КОНФЕРЕНЦІЇ  
"Агроінженерія:  
сучасні проблеми та перспективи розвитку"  
(7–8 листопада 2019 року)  
присвячена  
90-й річниці з дня заснування  
механіко-технологічного факультету НУБіП України***



Київ – 2019

УДК 631.171.075.4

## INFLUENCE OF SLUDGE OF BIOGAS PRODUCTION ON YIELD AND SUSTAINABILITY OF CROP PRODUCTION

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Manure, which is a waste product of livestock production, usually applied to increase the fertility of the soil as an organic fertilizer. However, in the first year of application of fresh cattle manure plants use 30-40% of phosphorus, 60-70% of potassium and only about 18% of the nitrogen contained in it. Full assimilation by plants of nutrients of manure occurs within three years. The decomposition of manure simultaneously with the mineralization of nitrogen, phosphorus and sulfur, at least 70% of the carbon of the organic substance is converted into carbon dioxide. On the one hand, this improves the nutrition of plants through photosynthesis, but significant amounts of carbon dioxide not used by plants gets into the upper atmosphere, enhancing the greenhouse effect.

So before you make fresh manure in the soil must be prepared. Composting produces humus, nutrients which can be digested much better. However, the composting process takes quite a long time, it does not solve the problem of emissions of carbon dioxide. Another method of preparing the manure to a more complete utilization of nutrients by plants is methane fermentation. This forms a valuable organic fertilizer in different sources is called differently: biochem, slurry biogas production, effluent, biogas residue, biogaratie, digestate, digestate pulp, etc., and a significant portion of carbon, which in other cases participated in the greenhouse gas, carbon dioxide is converted into energy methane gas, which is mixed with carbon dioxide forms a biogas.

In the works indicated that the sludge of biogas plants, including those obtained after anaerobic digestion of sewage sludge, due to the high content of nutrients (N, P, K) can be used as organic fertilizer for agricultural L. Baader, W. Dohne and M. Brenndorfer explained the mechanism of formation of such a quality organic fertilizer in the process of methane fermentation of waste, according to which the process of fermentation, the ammonia is released from organic nitrogen compounds together with compounds of phosphorus and potassium present in the substrate and formed as a result of decomposition, and turns pereobrazhennya mass in the nutrient-rich organic fertilizer. In addition, depending on the degree of fermentation, reduced carbon content compared with its content in the initial substrate. The resulting decrease in C/N ratio is favorable when using sludge as fertilizer. In addition, during anaerobic decomposition of organic matter the decomposition of organic compounds responsible for the presence of unpleasant odors in the initial substrate. Therefore, the sludge of biogas plants, as a rule, does not have the odor that is characteristic for the initial product prior to its anaerobic digestion.

The degree of decomposition of organic matter (bioconversion) liquid manure depends on exposure. According to V. I. Kravchuk, V. S. Targoni and V. P. Klimenko, the maximum degree of bioconversion of organic substances 53% (technical digestion) is achieved only when long-term exposure and in practice not used. Best organic fertilizer for methane fermentation under mesophilic mode is obtained when the degree of bioconversion of organic matter 30-33%. To achieve this level of bioconversion of organic matter in flow-through reactors complete mixing of the necessary exposition 20-22 days. It should be borne in mind that in equipment of continuous and quasi-continuous action part of the substrate can exit from the installation is not completely processed. In installations of periodic action, the average duration of the fermentation raw materials in the psychrophilic temperature range is 30-40 days or more, in mesophilic mode – within 10-20 days under thermophilic – within 5-10 days.