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MANURE FERTILIZERS: ALTERNATIVE PRODUCTION TECHNOLOGIES AND THEIR ENERGY DEMANDS

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Swine manure disposal has become a significant problem for industrial scale breeding facilities. The average daily manure production is around 0.03 m³ for one pig. Traditionally, manure is used as a fertilizer. However, environment safety limits the amount of manure that can be applied to soil and the time available for fertilisation. Large breeding facilities need to store manure during the winter season (when fertilisation with manure is forbidden) and transport manure to more distant farmland. The current trend in legislation is toward a reduction of pollution risk and recycling of nutritional compounds present in waste streams. The development and implementation of manure processing methods are required to meet the future standards. Several processing methods for manure were tested at laboratory and industrial scales. Each method has its advantages and disadvantages. This work presents a short comparison of manure treatment methods. Special attention is given to the fertiliser production aspect since it is an alternative to the production of synthetic fertilizers based on fossil fuels and minerals. The main problem with fertilisation with manure is a relatively low concentration of nutritional compounds in comparison to synthetic fertilizers. Thus, the technologies used for nutrient concentration are of special importance. These technologies include reversed osmosis, ammonia stripping, and precipitation. To compare the effect on the environment, the energy demand is calculated for each technology. This parameter was chosen because it does not depend on fuel market price and will be similar in different world regions. Moreover, the transportation costs of the derived fertilisers are compared. The presented calculation shows that selection of the most suitable treatment technology depends on the distance between the manure production facility and fertilised farmland.

Biography

Slawomir Jablonski completed his PhD at the age of 29 years at the University of Wroclawski (Poland). The subject of PhD was computer modeling of microorganisms' population involved in anaerobic digestion. He took part in different scientific projects regarding usage of anaerobic microorganisms in different applications. He has published around 10 papers in reputed journals in the field of microbiology, computer modeling of microorganisms' populations and anaerobic digestion. Currently he is working on the project focused on reduction of environmental impact of fertilization with manure.

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