

Poultry Waste Disposal

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Abstract – This research addresses methods of poultry manure utilisation to produce organic mineral fertiliser. We studied the prospects of use of clinoptilolite mixed with palygorskite as adsorbents of ammonia emissions from bedding used on a poultry farm.

Keywords – adsorbent, poultry droppings, ammonia, utilisation, organic mineral fertiliser.

Introduction

Application of intensive production processes in the field of poultry farming results in the huge accumulation of poultry droppings. Research data shows that part of animal excrements, urea and manure in over 13.5 mln ton of agricultural wastes generated in recent years make 37% (or 4.938 mln tons).

Description of the problem

Generated droppings amount is determined either by a calculation method based on average annual litter output per middle-aged bird, or by weighing, as referred to in [1]. The chemical composition of droppings, which content and properties depend on bird species, keeping and feeding as well as accumulation conditions, defines its processability. It is found [2], that moisture content of laying-chicken droppings is 68-78%, pH = 6.8÷7.4, and density is 1.04-1.15 g/cm³. Dry droppings content is presented in [3].

An initial stage of manure production is accumulation of droppings in a dung yard. During storage of poultry manure its losses can be as follows: by organic matter – up to 30-60%, by nitrogen – up to 36%, by phosphorus – 12%, by potassium – 10%. [2, 4, 5, 6]. Poultry droppings utilisation methods are studied by scientists and technologists for a long time. These studies are related to the development of efficient ways of manure storage in a dung yard, composting in pits and worm composting [7-10], thermal drying at different temperatures (65 to 1000 °C) in order to receive powderette [2, 11, 13], anaerobic and biologic fermentation using aerobic meso- and thermophilic bacteria to produce biogas, and pyrolysis for production of heat and energy [12, 15]. Also, studies are carried out in formation of a balanced organic and mineral fertiliser composition, which would combine favourable properties of both organic and mineral fertilisers as a result of change of phosphorus and nitrogen content as well as adding admixtures [14-17].

We consider adding sorbents like clinoptilolite and palygorskite to litter followed by granulation and drying one of the most efficient methods of poultry droppings utilisation. The benefits of this method include relative moisture indicator (12-15%), odour-free product, convenient packaging and application to soil, nearly complete sterility from pathogenic organisms and weeds, and reduction of droppings weight in 3-4 times.

Conclusion

The studied composition of organic fertiliser of prolonged action based on poultry manure and a mixture of palygorskite and clinoptilolite will serve as means for improvement of the soil structure.

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