



A Monthly e Magazine
ISSN:2583-2212

March, 2017, 60-63

Online popular Article

Poultry Litter production and its Economic Value

Manoj kumar Sinha*, Manju Sinha

Assistant Professor, Department of Veterinary Anatomy, Bihar veterinary college, Patna
Assistant Research Officer, Division of Virology, Institute of Animal Health & Production, Bihar,
Patna

Introduction

In recent years, one of the rapidly growing livestock sectors is broiler farming. Due to the growing broiler production, the issue of manure utilization is becoming more important not only from an environmental standpoint, but also from an economic aspect. In comparison to other organic matter-containing fertilizers, broiler manure includes a high percentage of readily available micro- and macro-elements for plants and enhances the soil physical characteristics, soil organic matter content, water-holding capacity, nutrient uptake, and, ultimately, plant productivity. Raw poultry manure is highly recommended to be treated before use directly as a fertilizer due to its pathogen microorganism content. Composting produces a valuable and environmentally favorable end product. A single chicken before slaughter produces about 2kg manure in its lifetime.

Composition of Litters

Poultry waste is composed of manure/dropping (organic matter), blood & feather (proteins), offal (lipids) and head & feet (proteins & lipids). Poultry litter is the mixture of bedding materials such as sawdust and wood shavings, feathers, spilled feed, and manure. Poultry manure contains all 13 of the essential plant nutrients that are used by plants with approximately 65.5% of nitrogen, 83.5% of potassium, and 68.5% of phosphorus. These include nitrogen (N), phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), manganese (Mn), copper (Cu), zinc (Zn), chlorine (Cl), boron (B), iron (Fe), and molybdenum (Mo). Using poultry manure as a fertilizer for crops or trees may provide a portion, or all, of the plant requirements.



Economic Importance of Poultry Litters

- **As a Very Good Organic Fertilizer-** Poultry litter is a rich fertilizer with a great number of nutrients essential for plant growth and has been used as organic fertilizer for centuries. It contains a high amount of major nutrients especially N, P, and K. and trace nutrients like Cu, Zn, As etc. are also present in this manure.
- **As Fish Feed Supplement-** poultry litter used as fish feed supplement. Some poultry farmers especially in China take this advantage to construct battery cages directly on ponds while others feed poultry manure directly to fish. Whereas some poultry fish farmer in directly throw dead poultry into fish ponds so that waste is now recycled into inputs. The nitrogenous waste from poultry litter can efficiently fertilize ponds for growth of plankton as fish food.
- **As an Effective Soil Amendment-** poultry litter acts as soil amender. Excessive application of chemical fertilizers and continuous cultivation of the same crop in the particular field cause deterioration in soil structure and soil quality. Poultry manure has been found to decrease the bulk density and to increase the water holding capacity, organic matter content, oxygen diffusion rate, and aggregate stability of the soils. When poultry litter is used as a mulching material, it conserves soil moisture and save the surface feeding roots from drying out in the summer heat.
- **As a Bio-oils-** For instance, broiler and turkey litters were converted into bio-oils and organic fertilizers and the gas generated in this process was used to operate pyrolysis unit in what seems to be a self-sufficient machine.
- **As a Very Good Animal Feed-** Properly processed poultry manure and litter are enriched with protein, minerals and fiber and have been mixed with cattle feed for these nutrients. Poultry manure or litter can be used as feed for cattle and fish.
- **As a Good Fuel Source-** Poultry litter can be used as a great source of fuel. Poultry litter with moisture content less than 15% can be burnt directly as fuel to generate heat energy. Biogas, a very useful combustible gas with around 60% methane, can be produced by anaerobic digestion of poultry waste. Biogas, produced by poultry litter, can be used for various purposes including fuel for engines, to produce electricity, to produce heat by simply burning and so on. Turning the pile regularly is needed to homogenize the pile. Turning and maintaining pasteurizing heat (55-65°C) for 2 weeks kills all weeds and pathogens and gives compost which is not properly mature. The compost thus results is not stable and emits strong odor but still that is good fertilizer with no weeds and pathogens.



Biogas (methane) is produced from organic matter through anaerobic decomposition and this process is called methanogenesis.

Method of Compost Production

Compost is the uniform, stable, odorless, soil-like product of a natural, biological process known as composting. There are many potentials on-farm and off-farm uses and markets for compost including the nursery industry, organic growers and vegetable producers, homeowners, golf courses, highways and land reclamation. Poultry wastes contain some harmful bacteria like *campylobacter* sp. *E. coli* and *salmonella* sp. and can cause illness if ingested. Compost used as a soil conditioner and organic fertilizer. Composting process depends upon the activity of microorganisms. These microorganisms require a carbon: nitrogen (C:N) ratio between 15 and 25, a moisture content of 40 to 60%, a pH between 5 and 12, and greater than 30% free air space. In order to use the manure from poultry birds produce as fertilizer it needs to be composted first. There are four general methods of producing compost.

- **Static pile-** The simplest form of producing compost involves mixing the poultry litter with a carbon source (most often sawdust) and putting it into a pile that is aerated from below.
- **Windrow methods-** It involve laying out the poultry litter/sawdust mixture in long piles that form tall rows. The rows are turned periodically to increase aeration and thus speed the composting process.
- **Improved windrow-** It is similar to standard windrow but involves greater capital expenditure on equipment and facilities that increase production efficiencies and reduce production time.
- **In-vessel and agitation systems-** It involve putting the input mixture into trough bays or large drums that mechanically agitate the product. This system has the shortest production cycle but involves the greatest expenditure on equipment, facilities, and operation.
- **Electricity Generation-** Different types of technologies are being used in different poultry farms in the country. The most common one is to use natural gas generator which uses biogas as fuel. But this power plant in Tamil Nadu's Namakkal district uses 300 tones of poultry waste to produce 4 MW of electricity every day. First, the plant produces methane by fermenting the poultry waste through a process called bio-methanation. The gas is used to run turbines which generate power. The supply is connected to the state electricity grid.
- **Used as forest fertilizers-** Poultry litter would be applied to forest land primly as substitute for commercial phosphorus fertilizer such as diammonium phosphate (DAP).



References

- Anonymous, 2007. Converting poultry litter in to bio-oil. Poultry International. www.poultryinternational.digital.com. pp 1–3.
- Beegle, D. B., 1990. Manure nutrient management plans for crops. Proc. 1990 National Poultry Waste Management Symposium, pp.214-220.
- Mohamed, A.M.; Sekar, S.; Muthukrishnan, P. Prospects and potential of poultry manure. *Asian J. Plant Sci.* **2010**, 9, 172–182.
- Rangayya, V., 1977. Poultry cum fish farm. (“The Hindu”). *Asian Livestock*, 3 (3): 1–5.
- Willson, G. B., 1989. Combining raw materials for composting. *Biocycle*, August, pp.82-85.

