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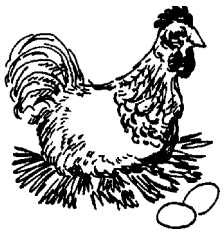

COMMERCIAL EGG TIP...

IN-HOUSE COMPOSTING: A NEW APPROACH TO LAYER MANURE MANAGEMENT

Commercial cage layer houses hold large populations of hens for production of eggs. An inescapable consequence of this practice is that these houses also produce an abundance of manure. The shallow pit system, now seen only in old houses, allows manure to accumulate in shallow depressions under cages from which it must be removed every few weeks. Newer stack cage houses use conveyors under each cage level to remove manure every few days. Both these systems require manure handling year round to remove and land apply, store or process the manure. The flush system, which washes manure into a holding lagoon, is convenient from a materials handling perspective, but is becoming obsolete because of environmental protection concerns. The high rise layer house has become a popular design because it allows manure to fall directly into a storage area below the hens to accumulate for many months before cleanout.

The high rise system is not without challenges. The manure accumulation can be a good breeding environment for flies and other insects, and can provide nesting sites for rodents. If the manure is too wet, it is difficult to handle when removed and produces a disagreeable odor. Insects, rodents, and odors may give rise to nuisance complaints and make it difficult for egg producers to remain in operation when residential development encroaches on rural areas.

The plant nutrients in cage layer manure can pollute ground and surface waters if excessive amounts of manure are applied to land. In some regions, the fertilizer value of these nutrients may not cover the transportation costs necessary to carry the manure to a sufficient agricultural land base to avoid water pollution.

It has been known for many years that composting can reduce volume and concentrate nutrients in manure, and improve manure handling and odor characteristics. The heating and mechanical disturbance associated with composting preclude vermin. As such, composted manure may have an improved value per ton and better market appeal.

In-house composting has been conceived to gain the benefits of layer manure composting without need for a separate composting facility. Table 1 shows some results from in-house composting studies done in two types of high rise house. In the naturally-ventilated house, manure mass was reduced by composting, particularly in the treatment having the greatest amount of carbon material at the start. In the tunnel-ventilated house, manure was dried too much by the mode of ventilation to allow effective composting. Even so, the treatment that began with the greatest amount of carbon material was driest and had the greatest fertilizer value per ton at the end of the study. Mass reduction either by drying or composting was associated with increased fertilizer value per ton of final product.

Perhaps even more important than the effect of in-house composting on physical characteristics of cage layer manure is its effect on fly production. Pitts, et al. (1998) greatly reduced numbers of fly larvae in in-house composted layer manure which was agitated twice a week. In the tunnel house study above, in which compost treatments were agitated once every two weeks without regard to the life cycle of the house fly, adult fly emergence was reduced by over 40% in a 5-day period in July after the compost was agitated.

In-house composting machines are now being offered commercially for use in high-rise layers houses. Some of these machines are designed to handle accumulations of compost for as much as a year before the final product must be removed. While there is more to learn about in-house composting to process cage layer manure or as a component of integrated pest management, any egg company which could benefit from an improved manure product or better fly control would be well advised to look into the option.

Table 1. Characteristics of compost/manure from in-house composting studies in two commercial high rise layer houses, one naturally ventilated and the other tunnel ventilated.

High Rise House[1]	Compost Treatment2 %	% Moisture	Annual Tons per 100,000 Hens[3]	Fertilizer Value per Ton[4]
Natural Ventilation	Control	64	1498	$26.64
	5 inches sawdust	56	1279	25.53
	10 inches sawdust	40	957	45.74
	15 inches sawdust	44	868	40.53
Tunnel Ventilation	Control	35	963	45.24
	5 inches sawdust	30	1002	39.51
	10 inches sawdust	32	992	45.72
	15 inches sawdust	23	971	47.76

[1] Naturally ventilated house: 35 week study; - data adapted from Thompson et al., (2001). Tunnel ventilated house: 40 week study; - data adapted from Webster et al., (2000).
[2] Compost treatments began with the indicated depths of fresh pine sawdust for a carbon source.
[3] Projected to a 52-week basis from compost/manure data at the end of each study.
[4] Estimates based on typical values for N, P2O5, K2O, and Ca.

References:

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