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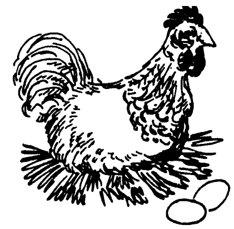

COMMERCIAL EGG TIP . . .

CAN IN-HOUSE COMPOSTING REDUCE FLIES IN HIGH-RISE LAYER HOUSES?

High-rise layer houses offer great convenience by allowing long-term storage of manure in the lower level of the house. Unfortunately, this convenience is associated with the problem that the manure can support production of considerable numbers of flies. Flies can create serious nuisance issues for layer houses located in the vicinity of residential communities. Once manure has begun to accumulate, the manure storage area of a high-rise house does not provide easy access to employ procedures which might reduce fly production. However, the recent introduction of commercial in-house composting machines capable of spanning and traveling along manure windrows may make effective interventions possible.

University of Georgia research on in-house composting of layer manure over the last few years allows us to share some insights on the process. In-house composting produces a product that is more uniform and friable, with lower average moisture content and more pleasant sensory characteristics than undisturbed high-rise layer manure (Thompson et al. 2001). This product is nutrient rich, making it valuable as a soil amendment. Even so, unless a company has an available market for a value-added compost product and the resources to access that market, it may be hard to justify the investment in the carbon source and compost machine purchase, maintenance, and operation needed for in-house composting. Ability to control flies, however, may make such an investment worthwhile for some egg producers regardless of a market for the compost product.

In-house composting produces sufficient heat in the compost windrows to kill immature life stages of the house fly, and significant reductions in fly production have been shown using the process (Pitts et al. 1998, Miner et al. 2001, Webster et al. 2001). However, it is essential that the immobile stages, i.e., eggs and pupae, be regularly incorporated into the heated zones to break the life cycle of the fly population. The temperature in an active compost transitions from a hot interior zone to a relatively cool zone at the compost surface, meaning that there is always a zone in the windrow that is the ideal temperature for maggot development. Since the house fly can mature from the egg in 5-7 days under ideal conditions, the compost remixing cycle should be no longer than once in five days. We have noticed that large mature maggots migrate out of in-house compost windrows soon after the compost is remixed, and may gather in large numbers under the edge of the windrow where the temperature is relatively cool. They then pupate in these areas. If detritus is allowed to accumulate between the compost windrows, many of the maggots will pupate in the zones between the windrows. It is critical that these pupae be gathered up during compost remixing and placed into the hot zone of the compost where they will be killed while still immobile. If sufficient numbers of these maggots are not gathered up and killed, it will be impossible to control flies in the layer house using in-house composting. Some implications arise from this fact. It is necessary to have a composting machine that is able to sweep the floor clean between the compost windrows, and place any pupae gathered into the interior of the reconstituted windrow. Secondly, it may be important to maintain a cycle of in-house composting only so long as the adjacent compost windrows can be kept discrete from one another or from walls before cleaning out. Otherwise, significant amounts of compost may fall beyond the main body of a windrow after remixing, forming large cool zones with enough mature maggots and pupae to maintain a substantial breeding population of flies.

Another critical time for in-house composting is at the start up of the process, when interior temperatures have not become high enough to kill immature life stages of the house fly. It is essential to build and manage the initial compost windrow to achieve high temperatures quickly. This can be facilitated by ensuring that the compost has the correct moisture level, i.e., 40%-50% H_2O, enough volume to retain heat, and sufficient nitrogen to support action of thermophilic bacteria. Addition of a nitrogenous material such as some in-house compost or manure from the previous cycle to supplement the carbon source should speed up compost heating.

In-house composting does not just kill fly larvae. In our experience, it is effective at eliminating darkling beetles and hide beetles, which can damage wood and insulation, but also arthropods which function as predators of fly eggs and larvae. Thus, if in-house composting is used as a method for fly control, a company's management of the process must be good enough to prevent fly outbreaks that could occur due to inattention, because natural predator populations are minimal and conditions are ideal for fly reproduction. In-house composting to control flies does have the added benefit of eliminating a lot of habitat for rodent populations.

In-house composting should not be expected to remove the need to use pesticides at critical times in the manure management process or at opportune locations in the house, but if managed properly, can reduce the amount and cost of pesticides used to control house flies (Keddie, 2003). As such, in-house composting can be considered a tool in an integrated pest management program to achieve a large measure of house fly control when employed properly and help to minimize the development of pesticide resistance in local house fly populations, making pesticides more effective when they must be used.

References:

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