

North Carolina Poultry Industry Joint Area Newsletter

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Preventing Fires in Litter Storage Structures

James Parsons, Area Specialized Agent, Poultry, NC Cooperative Extension

Proper litter management is a major component of the overall management of a poultry farm. Poultry litter, like swine effluent can only be land applied in the following conditions: 1) to an actively growing crop, 2) to a field that will be planted within 30 days, and 3) to a field where the crop will break dormancy within 30 days. Because of these restrictions, more and more poultry farmers are constructing litter storage structures. Litter storage structures enable poultry farmers to store or stockpile poultry litter and land apply the litter to meet the preceding regulations.

A danger associated with litter storage, however, is the possibility of fire caused by heat generated within the manure (litter) pile. Spontaneous combustion in a litter stack can result from the buildup of combustible methane or the storage of wet and dry litter. Fires may also occur if the manure is stacked too closely to wooden walls that may ignite when the temperature in the litter reaches the wood's flash point. Fires in litter storage structures can be prevented if the storage site is properly located and maintained.

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Beetle Control: Getting the Most from Insecticide Treatments

Mike Stringham, Extension Specialist and Wes Watson, Veterinary Entomologist, NC State University, Raleigh, NC

We now have two or three new insecticides that control darkling beetles really well. If you happen to have turkey brooder houses or grow light broilers, reports on one insecticide in particular (imidacloprid) say it's so good there are very few beetles around by the end of the flock. Results with another insecticide (spinosyn) can be near as good, but have been less predictable. The pyrethroid called bifenthrin is not as persistent but looks promising as a rotational product. Imidacloprid and the others certainly control beetles better than any other, but for turkeys, still fail before a flock is ready for market. However, control is much better than it was. Things are looking up even if there are some complaints, such as the neighbor not getting good control with any of the new products, or perhaps the control you get doesn't seem as good as it should be. What gives? Unfortunately, the answer all too often is application. Here are a few things to think about when treating for beetle control.

Don't short the application rate. Most product labels list a low and high rate for beetle control. It's important to remember that the difference between the two relates to the severity of beetle infestation more than anything else. Use of the low rate to control even a moderate infestation generally does not work well. In the case of imidacloprid, there is only one rate, but a common practice is to cut that rate in half. As a result, beetle populations rebound 4 to 5 weeks after the imidacloprid is applied. That rebound is often large enough to be a problem for the next flock which, if you have to treat every flock, makes it's harder to

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Preventing Fires in Litter Storage Structures

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Common factors in litter storage fires include: moisture, caked litter, layering, pile size and compacting. Moisture is a critical factor in all litter storage fires. Perhaps the most common error made by poultry farmers is adding moist litter to a dry stack. Heating and the formation of methane gas begin as the dry litter absorbs moisture. Anaerobic bacteria generate about 50 to 65 percent methane, about 30 percent carbon dioxide, and a smaller percentage of other gases. Therefore, if the moisture content of stored litter is more than 40 percent in a stack with little or no oxygen, conditions are right for anaerobic bacteria to grow and produce methane gas. Heating and methane gas formation can be avoided if litter is allowed to dry completely before it is applied to the stack. If the stack has adequate pore spaces, any methane that forms will escape harmlessly into the atmosphere. Stacks exposed to wind-driven rain can accumulate moisture and become a fire hazard, so litter should be protected from blowing rain.

Cake litter cleaned out from underneath waterers will usually have a high moisture content and can also contribute to litter storage fires. Caked litter will be much higher in moisture than litter located throughout the rest of the house. It is a good idea to separate piles of high moisture caked litter from drier litters.

Layering new moist litter on top of old dry litter creates an insulated, heat-producing situation. Litter should be completely dry before being added to a stack.

Pile size affects heat release. Pile height and width are more critical than pile length. Small piles provide greater surface area for heat release: large piles increase the chance for excessive heat or fire. A litter stack should be no more than 5 feet high.

Compacting litter will trap heat in the pile. Litter or moist cake should not be compacted. Compacting creates anaerobic conditions and prevents the natural venting of methane. Heat is not easily released from a compacted pile.

The following recommendations should help prevent litter storage fires.

1. Keep litter dry! Wetting litter will not prevent a fire; just the opposite may happen. Protect litter from blowing rain.
2. Store caked litter in a separate pile from dry litter.
3. Avoid compacting moist or dry litter.
4. Stack litter no more than 5 feet high.
5. Keep moist litter uncovered. Let litter piles vent naturally.
6. Allow new litter to dry completely before layering it on top of old litter.
7. Stack litter away from wooden walls or structural support posts.
8. Frequently monitor temperatures at various locations within the pile, and remove any materials that have temperatures greater than 180 degrees F. If temperatures exceed 190 degrees F or if the material is smoldering, notify the local fire department and get instructions for removing material from the building. Use extreme caution: a smoldering pile can burst into flame when exposed to air.

New Staff Announcement

Doug Smith received his undergraduate degree in biology and graduate degrees in Poultry Science from the University of Georgia with major emphasis in poultry muscle physiology, meat quality, and egg microbiology. Doug was employed at GoldKist in Sumter, South Carolina, Hudson Foods in Albertville, Alabama, and OK Foods in Fort Smith, Arkansas (all broiler chicken processors and further processors). He left the industry and spent 3 ½ years as Asst. Professor at University of Georgia Poultry Science with 90% Extension and 10% Teaching appointment. For the past 8 years Doug has been at the USDA as a research scientist in the Agricultural Research Service conducting studies on poultry carcasses, meat, and eggs for both safety and quality issues. He arrived at NC State in November, 2008, as Assoc. Professor of Poultry Science. He will be teaching a poultry processing and further processing class and a management class, conducting extension programs for chicken, turkey, and egg processors, and research projects on chicken/turkey/egg safety and quality.



Beetle Control: Getting the Most from Insecticide Treatments

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rotate insecticides effectively. The recommended rate for the imidacloprid extends its efficacy for another 3 to 4 weeks. The extra time is long enough to finish a heavy broiler flock without a serious rebound in beetle numbers, and may prove helpful in turkey growout when previously treated brooder litter is transferred.

Band your application. Often, beetle numbers are predictably higher in certain areas of the poultry house. Their exact location varies with type of production, temperature and flock age among other things. Concentrations of beetles typically first appear in the warmest part of the house. Beneath feeders and along walls and support posts are other areas where beetle and larval numbers grow quickly during the first few weeks of the flock cycle. The pest doesn't overrun less attractive areas until the fourth or fifth week. The lesson here is to concentrate treatments from walls to inboard drinkers. It's probably not necessary or particularly useful to limit initial treatments to bands within that zone. With persistent-type products, early control in critical zones as mentioned above can effectively reduce the overall beetle population throughout the rest of the house.

Any old sprayer won't do. Applying insecticide is not like washing and disinfecting a house. Why should the same equipment be used to do both? These days the conventional wisdom says that low volume application (as little as 4 gallons in some cases) is more effective than applying insecticides in 200 to 300 gallons of water. The evidence from the field supports that conventional wisdom. It might be time to spend \$600 - \$900 for a good sprayer that's designed for low volume application of insecticides. It should have a short boom equipped with an appropriate number of low volume, flat fan nozzles, an adequate pump, and a spray tank that will hold a minimum of 25 gallons. The spray boom should be articulated so that the ends can be set to vertical for spraying walls. Consider the 25 gallon tank to be the maximum volume necessary to treat one house; two, if application volume per house is halved. And don't forget to calibrate the sprayer before every use. It's a good habit to fall into, and will ensure that application is consistent from one flock to another.

NC State Feed Science Program Update

Charles Stark, Assistant Professor, NC State University, Raleigh, NC

The Feed Science Program at NC State University has launched a new web-site. The web-site highlights the Feed Mill Educational Unit, Academics, Extension, and Research efforts at NC State. The site provides a history of the feed mill construction and capital campaign, overview of the manufacturing equipment, and virtual tour of the feed mill. The Feed Science Program offers both undergraduate and graduate students new and exciting courses in feed technology, quality assurance, formulation, and operations and leadership. Students can pursue a minor or certificates, which are offered on-campus and through the distance education program (DELTA). The distance education program allows individuals working in the feed industry to continue their education by taking classes on line. Classes are offered in the Spring, Summer, and Fall semesters. Students can select one of three education programs offered at NC State:

- Feed Science Minor
- Feed Milling Certificate
- Graduate Certificate in Feed Science

Conference proceedings, presentations, and research efforts are posted in the Extension and Research sections of the web-site. The site also provides quick links to state and national trade associations and government agencies (EPA, FDA, and OSHA). Visit the "Feed Science Program" web-site to find the latest information about upcoming events, as well as the academic, extension, and research efforts in the College of Agriculture and Life Sciences at NC State. www.feedmill.ncsu.edu



Contact Charles Stark (charles_stark@ncsu.edu) for more information about Feed Science Program.

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