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Cooperative Extension Service
College of Agricultural and Environmental Sciences / Athens, Georgia 30602-4356

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BROILER TIP . . .

DARKLING BEETLES IN BROILER HOUSES

Anyone visiting a poultry farm will quickly become aware of the secondary occupants in and around the houses. The darkling beetle is an insect that is commonly found around poultry, specifically meat production birds and to lesser extent commercial layers. The beetle is also known as "lesser meal worm" and its common habitat is flour, meal, and other grain and cereal products. It originated in the tropics and is well suited for warm humid conditions making the broiler house the perfect habitat for it. Inside the houses, beetles can be found under feed pans and feed lines where spilled feed is mixed with litter. The life cycle of darkling beetles take 40-100 days depending on the temperature, as they tend to multiply more quickly as the temperature increases. The adult beetle can live for more than twelve months, with the female beetle laying up to 2000 eggs during its lifetime (Rueda and Axtell 1996).

Problems associated with Darkling Beetles

High beetle populations in poultry houses can pose serious economic and bird health problems for the producer. When the birds are removed from the houses, beetles will migrate from under the feed lines and feed pans to the walls of the house. They move into the walls burrowing into the insulation and structural wood of the houses to pupate (Geden and Axtell 1987). The resulting insulation destruction causes a reduction in the tightness of the houses and increases heating and cooling costs for the grower. Young birds can consume large numbers of beetles which can interfere with feed consumption and can result in pathogen transmission (Despins and Axtell 1994, 1995). It has been shown that darkling beetles act as vectors for a number of poultry diseases such as; fowl pox and Newcastle and act as host for E. coli, *Salmonella*. They also act as intermediate hosts for roundworms and tapeworms (Arends, 1997). Another important problem that can arise from high beetle populations is that of neighbor relations. Litter that had been spread in fields and contains high beetle numbers have resulted in nuisance complaints because these displaced beetles tend to seek refuge in nearby homes (Kaufman et al., 2002).

Beetle Control

Delaying litter removal to only once every four or five flocks to reduce production costs has increased the beetle problem and made control more difficult (Axtell 1999). As built-up litter systems increase within the industry, it has become evident that controlling darkling beetles will not be an easy task. Having an effective and successful beetle control program is dependent on several factors:

1. Litter depth. If the litter is too deep, it will provide a means of escape for beetles to evade the effects of the insecticide.
2. One must follow the manufacturer's directions when mixing and applying the insecticide. Increasing the amount of water used to mix the insecticide or reducing the amount of insecticide in the mix will reduce the effectiveness of the chemical. Mixing insecticides with disinfectants will reduce the effectiveness of the pesticide.
3. The area in the house where the insecticide is applied is important. Insecticide should be applied under the feed lines, along and on the walls, in the corners and around the entrances of the house.
4. It is best to apply the insecticide during the warmer times of the day since this is when the beetles are most active. However, insecticides with residual effect will still be effective when beetles emerge from the litter.
5. Insecticide should be applied to the litter rather than on the floor, and litter should always be sprayed with insecticide prior to being removed from the houses and spread on fields.
6. Beetle populations should closely be monitored and heavy infestations may require two applications.

Solution?

The current practice of using chemical pesticides to reduce beetle populations often seems futile as emerging generations of beetles develop resistance to chemical classes. This is a result of a genetic shift. This happens when the insecticide that is used kills the beetles within a population that are most sensitive to the active ingredient in the insecticide. The beetles that are least sensitive and are unaffected by the chemical will reproduce, eventually resulting in a beetle population that is insensitive to that active ingredient. Rotating pesticides to achieve some reduction in the beetle population is one way to combat chemical resistance (Rowland, 2007). Using effective insecticides from three different classes of chemicals within a calendar year will reduce the potential development of resistance. Presently there are four different classes from which a number of insecticides can be chosen. Poultry producers should choose the insecticides most suited for their operation from three of these classes to include in their annual rotation.

The present situation faced by poultry producers will require vigilance in order to control the population of beetles in the houses.

Summary

Darkling beetles are insect pests found in poultry houses often times in large numbers. High infestation inside poultry houses can result in economic losses and a potential for disease spread within the flock. Over the years the beetles have developed resistance to some insecticides. Effective control of these pests requires rotation of chemical to reduce the potential development of resistance to active ingredients in the insecticides. Other management practices such as time and mode of application, and monitoring the changes in the beetle population can also help in controlling darkling beetles and reducing their negative impact on the industry.

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Claudia Dunkley
Extension Poultry Scientist

Extension County Coordinator/Agent

Consult with your poultry company representative before making management changes.

"Your local County Extension Agent is a source of more information on this subject"