

PROJECT TITLE: Development of Alternative Darkling Beetle Management Strategies for Poultry Producers in the Northeast

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The darkling beetle and other "litter beetles" have emerged in recent decades as the most important arthropod pests of poultry production worldwide. The beetles are vectors of human and animal pathogens, cause costly damage to production facilities, and create public health/nuisance problems when they emigrate from farms or from land on which infested manure has been spread. The beetles are difficult to control with pesticides, of which only a few are available. The removal of any of the handful of remaining products registered for beetle control could create a crisis for the U.S. poultry industry.

Using a multi-state project (New York and Maine) we will deliver critically needed management solutions to U.S. poultry producers. In Objective 1, the relative susceptibility of beetles to pesticides registered for their control will be documented from multiple populations. This information will be used to identify developing resistance problems and to determine the status of future beetle control after removal of organophosphate and carbamate insecticides. In Objectives 2 and 3, we will evaluate manure handling/management strategies (composting, tarping, and soil incorporation) that some producers are already employing as alternatives to pesticides. These proposed solutions are cost-effective and easily incorporated into existing production systems. We anticipate that implementation, facilitated through proposed Extension outreach activities and web site development would be rapid and widespread.

Pesticide resistance studies were conducted with 4 field strains and two laboratory strains of darkling beetles. Adult and larval beetles were examined for susceptibility to cyfluthrin and tetrachlorvinphos. Studies investigating the impact of mechanical incorporation of darkling beetle-infested poultry manure into field soils and the resultant emergence of adult beetles was conducted in 2002 and 2004. The impact of covering darkling beetle-infested manure with black and clear tarps has been examined. A USDA-developed method for preventing adult and larval darkling beetles from climbing support posts in poultry facilities was also examined. The impact of turning and/or composting poultry manure was examined for impact on darkling beetle and house fly development. These studies were examined on four poultry farms using five methods of manure manipulation. Additionally, the development of house flies from composted manure was examined with surprising results. Currently most field research has been completed and data are undergoing analysis.

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