

Expanding Livestock Integrated Pest Management in the Northeast: *An IPM Training Opportunity for Northeast US Animal Agriculture Industry Personnel*

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Project Summary:

A two day “hands-on” workshop was held to train northeast US cooperative extension and other animal agricultural industry outreach personnel in an overview of livestock Integrated Pest Management (IPM).

This initial “train the trainer” program targeted key personnel involved in animal agriculture including, but not limited to, cooperative extension, state veterinarians, milk inspectors, and other multipliers responsible for local on dairy producer contacts. Participants learned IPM principles and practices as they relate to dairy production and enhance animal and human health, improve net profitability and minimize neighborhood concerns associated with off site migration of livestock fly pests. A combination of classroom, laboratory and on-farm activities were employed to train participants in current livestock pest concerns and management opportunities. Participants received training to help them acquire knowledge and develop skills to assess livestock pest problems and effectively manage these pests using the latest IPM principles and techniques. Participants were trained in identification, evaluation and management of filth fly pest problems of confined dairy livestock. They also became familiar with IPM resources, and better equipped to effectively assist their clientele in addressing confined dairy fly pests. Participants were surveyed pre and post participation to better assess their livestock IPM needs and concerns, and to help identify interest, opportunity and need for subsequent workshops. It is anticipated that these workshop “graduates” will help initiate and foster improved livestock IPM practitioner communication and networking in the northeast US.

Background

Dairy production is an integral component of many rural communities in the northeastern US, helping to sustain the economic viability of our region. In NY alone 7,100 dairy farms contributed nearly \$1.6 billion in dairy products to the states 2002 economy. In 1997, northeast U.S dairy and beef cattle associated revenues totaled \$4.4 billion (USDA Census of Agriculture). In addition, the value of these dairy and beef commodities in the eastern US, where the results of this project are most applicable, total \$ 15.4 billion.

Biting and nuisance flies, and external parasites adversely affect animal health and productivity and reduce farm profitability. A complex of pests is usually involved, which can differ in the

intensity of direct and indirect host effects. Damage from infestations of summer and winter active arthropod pests of dairy and beef cattle in the U.S. are estimated to exceed \$2.26 billion in losses annually (Byford et al. 1992).

In a 1997 survey of New York dairy farmers, twenty-eight percent of respondents indicated flies in and around barn areas were most difficult to control and 43% indicated flies in animal confinement areas were the most likely to cause economic loss (Harrington et al. 1998). Flies in and around the barn were treated an average of once a week. Most respondents (80-90%) employed cultural practices such as manure removal, while less than 5% of respondents released beneficial insects to manage barn flies. In this same survey, 52% of respondents selected flies on pastured cattle as being the most difficult pest to control and 56% indicated pasture flies were the most likely to cause economic loss (Harrington et al. 1998). Additionally, dairy farmers reported using insecticides two to three times per month to manage flies on pastured cattle.

Several challenges currently face those seeking to effectively manage livestock pests today. Implementation of the 1996 federally mandated Food Quality Protection Act (FQPA) has resulted in removal of a number of once commonly used livestock insecticide materials, such as dimethoate, naled and chlorpyrifos. In addition, insecticide manufacturers report fewer insecticides in development for use on livestock in the near future. Efforts by Cornell University researchers have documented widespread insecticide resistance in house flies, a primary pest on livestock operations (Rutz, Kaufman, Scott). In some studies, 100% of house flies treated with specific insecticides survived when treated with the legal application rate of insecticides.

As suburban areas encroach on rural agricultural landscapes, emigration of pest flies to off-site locations can act as a community lightning rod creating a new set of challenges for those involved in animal agriculture. This results from potential public health concerns and nuisance complaints from neighboring communities.

With fewer insecticides available, prospects for new materials limited, insecticide resistance more prevalent, and urbanization of once rural areas becoming more common place, livestock producers will continue to face increased challenges with fly management in the future. These issues highlight the need for producers to have the best information available to manage dairy cattle pests and to utilize a broad integrated approach that includes a variety of cultural, biological, physical and chemical tactics.

Livestock IPM information can, unfortunately, be difficult to obtain when needed most, due to a limited number of entomologists actively engaged in animal research and extension activities. In the northeastern United States, research and extension efforts to develop IPM strategies for managing pests associated with animal production are active at Cornell University (New York) but with few exceptions are lacking at other northeastern state land grant institutions.

The Cornell University veterinary entomology program, working in collaboration with the New York State IPM program, has developed extremely successful confined dairy and poultry fly

management programs. Many producers in our region are successfully employing the strategies promoted through these programs that emphasize IPM in and around animal production facilities. Efforts are also underway to improve the information available regarding integrated management of pests affecting animals on pasture.

A workshop and “hands-on” learning experience is proposed to share our IPM information and provide outreach professionals with skills and knowledge to train their clientele in the use of proven, effective, integrated pest management techniques that help minimize, avoid and mitigate common dairy livestock arthropod pest problems. This training will foster team building through direct contact of agriculture animal professionals and the initiation of an electronic listserv to provide networking opportunities and on-line technical support.

Although the primary focus of this workshop will be confinement area fly pests of dairy cattle, much of the information will also have applications for IPM efforts for beef cattle and horses.

Objectives

- 1) To increase the number of producers utilizing livestock IPM by increasing the number, awareness and IPM skill level of extension educator multipliers in the northeast. More specifically, we propose to engage extension and other outreach participants from northeastern states in an experiential learning opportunity of classroom, laboratory and on-site education regarding IPM approaches for the effective management of common dairy and livestock summer active arthropod pests.
- 2) To encourage communication and enhance teambuilding we propose initiating an electronic list serve to provide networking opportunities and on-line technical support for participants. This list serve can also help to identify stakeholder driven livestock IPM needs, priorities and opportunities for research and extension.

This workshop is viewed as a means to assess the interest and needs for future regional livestock IPM training for animal agriculture personnel and other outreach professionals.

Accomplishments/Milestones

A two day Livestock Integrated Pest Management workshop was held September 28-29, 2004 at the Ramada Inn in Ithaca, NY to train representatives of cooperative extension and state milk inspectors from northeast states. Integrated Pest Management (IPM) Coordinators and State Department of Agriculture Directors from Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia were contacted and invited to nominate cooperative extension and milk inspector professionals to attend the workshop. Fifteen cooperative extension (9), state department of health / Agriculture and Markets milk inspectors (2), dairy producers (1), organic growers (1), state department of agriculture (1), and US EPA (1) participated, representing Maryland, Maine, Massachusetts, New York, and Pennsylvania.

Pre-Workshop Survey

A pre-workshop survey was given to those enrolled to provide information helpful to tailoring the workshop agenda to best meet participant needs. (See Appendix 1). Survey responses indicated that although most participants had direct or indirect responsibilities for pest management issues there was considerable diversity in their IPM experience and training. Many participants had responsibilities for training growers, field staff, and/or industry and regulatory personnel, some individuals had Health Department milk inspection responsibilities. Entomological training of participants ranged from “minimal” to PhD. Most individuals did not have any formal training in livestock IPM. Training in IPM varied from “none” to “on-the-job training”, to graduate level courses and multiple years experience in IPM implementation. Many participants stated they had been previously contacted by clientele regarding a livestock pest management problem. Participants indicated their goal for attending the workshop was to learn more about the insect identification, lifecycle and management options of key pests especially of bovines, especially in pastured animals; but other systems too. Participants were interested in learning IPM approaches, less-toxic solutions, current recommendations and latest research findings in livestock IPM. Individuals were interested in constructive ideas for promoting and advancing IPM adoption among NE livestock producers (especially dairy and poultry). Participants were asked to rate the importance of specific livestock pest problems in their state. The results of this survey are presented in Table 1.

Table 1. Participant ranking of importance for specific dairy livestock pest problems in their state

| Pest Type | Average Rating |
|-------------------------------|-----------------------|
| House fly | 1.2 |
| Rodents in /around facilities | 1.2 |
| Mosquitoes | 1.8 |
| Birds in /around facilities | 2.0 |
| Stable fly | 2.5 |
| Horse and Deer flies | 2.8 |
| Sarcoptic mange | 2.8 |
| Chorioptic mange | 3.2 |
| Face fly | 3.2 |
| Cattle grubs | 3.3 |
| Horn fly | 3.6 |
| Cockroaches | 4.5 |

Ranking 1 = Highest, 5 = lowest

Workshop

The workshop consisted of three components: A) classroom presentations providing an overview of integrated pest management concepts, identification, biology, monitoring methods, assessment, management alternatives, control measures and evaluation of IPM programs. B)

laboratory presentations, examination of live and curated insect specimens, including pests affecting animals in confinement, on pasture, and common natural enemies (arthropod and fungal pathogens) of house and stable flies, and an overview of aspects of current house fly IPM research efforts being conducted at Cornell University. C) On-farm visit to a commercial dairy farm view fly problems and their effective integrated management in situ. The workshop concluded with discussion of resources available to further educate clientele on dairy IPM, a discussion of needs, opportunities, and topics for future workshops and educational resources, and an overall evaluation of the workshop. Appendix 2. Workshop Agenda.

Impacts and Contributions/Outcomes

A listserve of has been created to enhance communication among participants.

As the result of this workshop one participant provided dairy fly IPM training to his New York Department of Agriculture and Markets Milk Inspector colleagues in a series of workshops during October 2004. Another provided dairy fly IPM training to the northeast Certified Crop Advisors at their annual meeting in Waterloo NY in December 2004.

Following the workshop participants discussed needs and topic opportunities for future northeast region livestock IPM workshops. Suggestions included:

- ⌚ General fact sheet on pest trapping and related terminology, with special attention to definitions and clarification about attractants vs. pesticide baits, etc. The document would be geared toward informing about the many options that exist, and the advantages and disadvantages of each (rather than giving specific recommendations about which is best to use)
- ⌚ Organic / IPM – tailoring resources for this unique audience
- ⌚ Pasture Fly Management fact sheet – including pest biology. Participants suggested that providing information about pest life cycles and any portions of a proven effective IPM program may be very useful to generate further innovation and discussion
- ⌚ Economics of Dairy IPM (including manure management issues, i.e. composting; also including potential role of federal cost share monies.
- ⌚ Discussion of best time/format to reach dairy producers for IPM education/training (suggestions included 2 hours on farm in small groups, TAg formula, include lunch, twilight meeting).
- ⌚ Informal method for sharing Livestock IPM information – participants think an email list serve would be useful
- ⌚ Fly Management IPM Poster
- ⌚ Development of Field ID cards, laminated and included in a flip-pack (ID cards with multiple pictures of common pests of: poultry; pests found in food/processing rooms; pasture/range; house/confinement areas and buildings)

Efforts are underway to seek ways to increase communication and training of dairy industry personnel in livestock IPM.

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Further information on Dairy Cattle Integrated Pest Management can be found at:

NYS Livestock/Field Crops IPM: <http://www.nysipm.cornell.edu/lfc.html>

Cornell University, Veterinary Entomology Program, Department of Entomology

<http://www.entomology.cornell.edu/Extension/Vet/index.html>

Appendix 1. Participant Pre-Workshop Survey

Name:

Address:

Phone:

Email address:

What are your current job responsibilities?

What training have you had in:

Entomology

Livestock Pest management

Integrated Pest Management

Have you ever been contacted regarding a livestock pest management problem?

Briefly explain.

Will you have been out of the country and on a livestock farm during September 2004?

What do you hope to learn from this workshop?

In your experience, rate the importance of the following livestock pest problems in your state

| Pest | Very Important | | | | Not Important | Don't Know |
|-------------------------------|----------------|---|---|---|---------------|------------|
| | 1 | 2 | 3 | 4 | 5 | |
| House fly | | | | | | |
| Horn fly | | | | | | |
| Face fly | | | | | | |
| Stable fly | | | | | | |
| Heel fly / Cattle grubs | | | | | | |
| Mosquitoes | | | | | | |
| Chorioptic mange | | | | | | |
| Sarcoptic mange | | | | | | |
| Horse and Deer flies | | | | | | |
| Cockroaches | | | | | | |
| Rodents in /around facilities | | | | | | |
| Birds in /around facilities | | | | | | |

Appendix 2. Workshop Agenda

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|  | Livestock Pest Management Workshop Agenda September 28 - 29, 2004 Ramada Inn, Triphammer Rd, Ithaca, NY |
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Course Instructors:

Dr. Phillip E. Kaufman, Cornell University, Department of Entomology

J. Keith Waldron, Cornell University, NYS Integrated Pest Management Program

Tuesday - September 28, 2004

8:30 Registration, and coffee

9:00 Welcome, Introductions, Workshop Overview

9:30 Pest Management Issues for Confined Dairy Livestock

Integrated Pest Management (IPM) Steps (Flies - What's the Buzz?, Pest Identification)

10:45-11:00 Break

11:00 Sampling and Assessment

LUNCH – noon – 1pm

1:00 Pest Management – Options: Cultural, Biological, Physical

2:45 – 3:00 Break

3:00 – 4:30 Chemical

DINNER – 1.5 hours

7:00 – 9:00 pm

Laboratory –Schwardt Laboratory, Cornell University

Identification of key pests and common natural enemies

Insecticide resistance – demonstration

Laboratory tour, Discussion of On-Going Research Topics

Wednesday - September 29, 2004

8:15 am Recap, review, questions

9:00 Leave for Farm Visit

9:30 Farm Visit, Dairy Farm Freeville NY

Biosecurity

Introduction and Farm Overview Orientation

Common Pest Problems in Animal Production Areas: Milking Herd, Milking Parlor,

Heifer/Young Stock Area, Calf Area, Feed Storage / Bunk Silo, Manure Handling Area

/ Storage

Noon Back to Ramada Inn, Ithaca

12:30 Lunch – brown bag

1:00 Discussion

2:00 Resources Available: Factsheets, Guides, websites

2:30 Training Clientele Using The Dairy IPM Teaching module

3:15 Recap, review, questions
3:30 Departure