

**Title:** Dairy and Beef Biting and Nuisance Flies IPM Meeting Series - 2014

**Project Leaders:**

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**Cooperators:** Cornell Cooperative Field Crop Extension Educators

**Type of project:** Public Education

**Project location:** New York State

**Abstract**

A series of on-farm summer field meetings were held for dairy and beef producers to increase awareness of issues and IPM approaches to manage nuisance and biting flies on dairy cattle for animals on pasture.

**Background and Justification**

Dairy production is an integral component of many rural communities in the northeastern US, helping to sustain the economic viability of our region. In New York, 5,700 dairy farms were in production in 2010 contributing nearly \$1.6 billion in dairy products to the state's economy (NY NASS, 2010). In 1997, northeast U.S dairy and beef cattle associated revenues totaled \$4.4 billion (USDA Census of Agriculture, 1997). Additionally, the value of these 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, 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. have been 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 animal confinement area flies were the most likely to cause economic loss (Harrington et al. 1998). Flies in and around the barn were treated with an insecticide 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) resulted in the removal of a number of commonly used livestock insecticide materials, such as dimethoate, naled and chlorpyrifos. In the last decade, relatively few new insecticides have been registered

for use on livestock. Efforts by the Cornell University Veterinary Entomology research group have documented widespread insecticide resistance in house flies, a primary pest on livestock operations (Kaufman, et al. 2001). In some cases, 100% of house flies treated with specific insecticides survived when treated with the legal application rate of insecticides. The combination of fewer insecticides available and an increased presence of insecticide resistance heighten the potential for effective pest management options.

To complicate matters, 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.

Individuals relying upon a largely insecticide-based pest management strategy will find this tactic an inadequate approach to controlling these pests. 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.

Adult learning research indicates producers are more likely to adopt targeted new practices when the educational design promotes small groups, open discussion, and experiential hands-on learning on the farm (Kolb 1984, Koontz et al. 1994, Richardson 1994, Rogers 1983). Having the IPM dairy field meetings on a local producer's farm and inviting the local dairy farmers creates a trusting atmosphere. Producers are more inclined to adopt new methods of pest control when they can see and do it on their own farm. A series of field meetings were held to extend dairy cattle IPM information to better manage common nuisance and biting flies attacking animals on dairy pasture and in confinement areas.

## Objectives:

1. To increase the number of producers utilizing livestock IPM by increasing the number, awareness and IPM skill level of dairy producers and other agriculture professionals in the New York.
2. Evaluation of producer adoption will provide indications on the effectiveness of current educational efforts and identify strengths, weaknesses and opportunities to improve on training approach, impact, and producer use of IPM methods.

## Procedures:

Six on-farm and one in classroom meetings were held across New York to provide dairy producers, extension personnel, veterinarians and others with an overview of dairy and beef cattle IPM principles and practical approaches to managing common fly pests affecting cattle on pasture. These presentations were followed by an in the field demonstration and hands-on experience. By actively engaging individuals through seeing and doing, producers are more willing to adopt many of the new procedures and practices being taught on farms. We teamed with extension educators with direct connection to local producers in several areas of New York to strengthen outreach and potential impact. A typical meeting agenda is in Appendix 1.

As part of the program's activities and to enhance discussion, several examples of commercially available pasture and barn fly traps (sticky glue traps, alsynite, knight stick, Horse Pal and Epps biting fly traps) were installed at each location prior to the meeting. One location had a demonstration of the new Cow Vac for controlling horn flies. Meetings were advertised locally by the host extension educator.

## Results and Outcomes:

A total of 7 dairy IPM meetings were held in New York during 2014. Meetings were held on farms in Clifton Springs, Truxton, Hunt, Middletown, Chazy and Cobleskill, NY. In addition, we presented Organic Cattle Fly Management workshops at the annual winter meetings of the Northeast Organic Farmers Association in Saratoga, NY and the Growing Pennsylvania Organic Farms Conference, Harrisburg, PA (Table 1).

Table 1: Meetings conducted by date, location, audience and number of people attending.

Date	Topic	Location	Audience	Participants
January 25	Organic Cattle Fly Management Using the 1, 2, 3's of IPM	Saratoga, NY	Agricultural Professionals	35
May 6	Dairy Fly IPM	Malone, NY	Producers	10
June 26	Dairy Cattle Fly IPM	Clifton Springs, NY	Producers	12
July 1	Dairy Fly IPM for the Organic Dairy	Truxton, NY	Producers	18
July 25	Dairy/Beef Cattle Pasture Fly IPM	Hunt, NY	Producers	22
July 30	Dairy Cattle Barn Fly IPM	Middletown, NY	Producers	10
August 5	Dairy Cattle Pasture Fly IPM	Chazy, NY	Producers	12
August 10	Beef Cattle Pasture Fly IPM	Cobleskill, NY	Producers	17
Dec. 10	Organic Fly Control that Works!	Harrisburg, PA	Producers	20

			TOTAL	156
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The primary focus of the meetings was use of IPM related to barn and pastured dairy and beef cattle fly issues. The majority of participants were livestock producers, in addition a few participants also raised horses, goats, sheep or other livestock. A few veterinarians, USDA livestock inspectors and agribusiness personnel also attending the meetings.

Twenty-one participants completed post-program evaluations. The results of these evaluations follow. The actual questionnaire can be found in Appendix 2. The dairy and beef producers attending the pasture fly IPM meetings reported owning and managing about 1200 cattle on 1600 acres of pasture. Participants that attended the one on-farm confinement area/barn fly IPM meeting owned 400 dairy cattle and had an array of animal housing facilities including stanchion barns, free stalls and covered sheds for young heifers. Horn, stable, house and face flies were the predominant fly species participants observed on their pastured and confined livestock. Participants indicated they felt face, stable, house and horn flies cause economic losses to their animals.

All participants responding to the program evaluation questionnaire either highly agreed or moderately agreed that the meeting helped them better understand management of fly pests on pasture or in and around the barn.

Prior to the all of the on-farm meetings 70% of participants reported they did not use IPM thresholds in making fly management decisions. Following the meeting 100% of the participants indicated they would use IPM thresholds in their fly management strategies.

Table 2: The percent of participants that use of IPM thresholds (N=7)

	Used IPM Thresholds	Did not use IPM Thresholds
Before Meeting	30%	70%
After Meeting	100%	0%

Table 3 indicates what management practices participants used before the meeting and what they might change after the training.

Table 3: The percent of respondents (n=6) indicating specific fly management practices used prior to this meeting and what they will use (or consider using) after this meeting.

	Before		After	
	Yes	No	Yes	No
Epps Trap (non-toxic)	--	100%	100%	--
Horse Pal Trap (non-toxic)	--	25%	100%	--
Alsynite Trap (non-toxic)	--	66%	100%	--
Repellents (non-toxic)	25%	75%	100%	--
Back rubbers (Pesticides)	50%	50%	50%	50%
Pour-on (Pesticides)	25%	75%	100%	--
Ear Tag (Pesticides)	33%	---	100%	--
Whole body spray	100%	--	100%	--



Alsynite Biting Fly Trap for stable fly management



Horse Pal Horse Fly Trap



Portable Epps Biting Fly Trap



Bruce Style Walk-Through Fly Trap

Participant comments regarding knowledge gained to improve fly management practices and meeting effectiveness are shown in tables 5 and 6.

Table 5: Comments made by participants responding to:

“Please indicate how this meeting might have improved your fly management practices?”

- Understanding thresholds
- Not killing until I have to.
- More practices that can be implemented and new traps
- Discussing fly species and their ecologies and control tactics
- The information is easy to understand and very helpful. The integration of additional methods will likely improve efficiency and animal health.

Table 6: Comments made by participants responding to:

“What did you like most about this meeting?”

- The actual pasture-walk to look at the manure and see the insects and larvae in it.
- Understanding thresholds
- Did not take all day
- Demonstrations and new products for us
- Everything - Knowledge is power
- At the farm
- General fly information
- The speaker was extremely knowledgeable and relayed valuable information in a manner that was easy to understand. The demonstrations were also very helpful.

What fly management issues do you feel you need additional help with?

- Face flies and horn flies (2)
- Putting up sticky tape
- Killing instead of repelling
- Face flies

**Summary:**

Dairy fly IPM on-farm meetings were held in 7 New York counties during the summer of 2014. These events were successful in sharing dairy cattle IPM information with 101 participants. The meetings helped participants learn IPM principles and practices as applied to management of dairy biting and nuisance flies. The meetings were held on farms and employed an experiential learning approach with hands-on opportunities. Farmers preferred the on-farm in the field environment. Producer responses indicated they greatly appreciated the interactive and participatory learning approach of these meetings personalized to their specific farming environment.



Keith Waldron (NYS IPM Coordinator Livestock and Field Crops) demonstrates how to search for fly active breeding sites, teaching organic dairy producers about house and stable fly lifecycles including natural enemies that help control the pest. Producers are always surprised by how many natural enemies that help control fly larvae and pupae.

Until recently horn flies were very difficult to control organically. Some repellents are effective against common cattle pasture flies. The Bruce walk-through horn fly trap is another option to help remove pasture flies from pastured dairy cattle. The dairy cows walk through the trap on their way to milking. Flies like horn, face and stable flies that are on the animals as they enter the trap tend to fly off the animals and are caught in baffles built in the side walls of the trap. An improved walk-through trap, the CowVac has recently become commercially available. Cattle carrying pasture active flies such as the horn, face and stable flies walk through the chute of the Cow Vac and the flies are vacuumed off. It seems to work very well at removing horn flies from the cattle.

#### New Non-Toxic Technology: Cow Vac



Side view of the cowvac, entrance to right



Exit view of the cowvac

Various pasture fly traps demonstrated at summer cattle fly IPM meetings.

This is a compilation of non-toxic biting fly traps designed to reduce populations of flies attacking animals on pasture. There was a lot of interest in using traps like these to control biting flies on both beef and dairy cattle.



Horse Pal Horse Fly trap



Epps Biting Fly Trap



Alsynite trap and a Knight Stick for Stable Flies

Grower involvement lends additional interest, practical experience and credibility to fly management discussions.



Kathie Arnold an organic dairy producer at Twin Oaks Dairy in Truxton discussed the challenges of producing milk organically. She also discussed the use of new technology she purchased for non-toxic horn fly control called a cow vac.



Andrew King of Kings Roaming Angus Farm in Cobleskill discussing his pasture fly management strategies and issues with quality assurance and marketing his grass feed beef they sell at the green markets in Brooklyn and Westchester County.

## Barn Fly Management



This farm in Middletown, New York provided an opportunity to discuss how and where to fine-tune barn areas sanitation to remove potential house and stable fly breeding sites. Key areas include calf pens and cleaning feed and animal loafing areas to once a week remove manure and organic matter such as excess grass hay and silage. These photos illustrate potential fly breeding areas to target for sanitation. Sanitation is the main key to controlling house and stable flies around the barn.

As a result of knowledge gained through participation in these meetings producers stated they were going to use economic thresholds to better manage flies on animals. They also stated that they would consider using biting fly traps to potentially reduce insecticide use on the farm. Participants reported a better understanding of the importance and use of scouting and evaluating thresholds. Producers and extension personnel expressed enthusiasm and interest in having more meetings in dairy fly IPM and learning IPM approaches to manage arthropod pests affecting several other livestock species in the future.

In addition to county-based on-farm meetings we reached 55 individuals (producers and agribusiness personnel) through invited presentations of confinement area and pastured dairy cattle IPM to organic producers at winter meeting conferences in New York and Pennsylvania. The organic audience is highly receptive to IPM education. Responses to post program questionnaire's identified stable, horn and face flies as being most problematic and most likely to cause economic losses. Participants expressed interest in learning more about use of biological control agents, attractant-repellent research, assessing farm for fly breeding sites / areas to target improved sanitation and other fly management options.

**Key Words:** Stable fly, house fly, face fly, horn fly, deer fly, horse fly, dairy, cattle, IPM, integrated pest management, on-farm education.

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**Appendix 1: Flies Affecting Animals on Pasture Meeting Agenda**(Hour 1)

-Conduct a fun “Pasture Fly Quiz” with Participant

Importance aspect of Pasture Fly IPM:

- Animal Health,
- Economic Impacts
- Population Growth
- Pesticide Resistance
- Food Quality and Protection Act
- On / Off Site fly emigration and other effects

Identification and Biology of Horn Flies, Face Flies and Stable Flies.

- Similarities and Differences
- Management lies within the Biology for the flies
- All flies are not created equal - other potential pests

Integrated Management

- Monitoring Techniques & Threshold Guides
- Fly Trapping Technology (What can they do?)
- Natural Enemies are They Effective?
- Chemical Control, back-rubbers, sprays, ear tags
  - Insecticide Resistance Management
- Organic repellent Sprays-Do they Work?

Pasture Walk (1 Hour)



10. What did you like most about this meeting?

11. Where can we improve on research based information to better meet your needs as a producer?

12. What state do you farm in? \_\_\_\_\_