



Common Pest Flies Found in the Urban/Rural Environment and Their Biological Control Agents

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Introduction

The integrated pest management (IPM) of house flies and stable flies incorporates several key components. The first is correct pest identification. This fact sheet provides color photographs and important biological and ecological information on both pest and beneficial organisms often associated with livestock and poultry production.

Other components of IPM include monitoring, management action (i.e., treatment), and evaluation of the action. This fact sheet is intended to aid the livestock and poultry producer with arthropod pest identification and not to be a “how-to” document. For information on the other steps to successful pest management please consult one or more of the suggested references provided below.

Biological control, whether the organism occurs naturally or is commercially produced and released, is an important component in a successful livestock and poultry IPM program. The three types of beneficial organisms are parasitoids, predators, and pathogens.

Biological Control Agents

Parasitoids

Parasitoids are tiny wasps that attack only fly pupae. The parasitoid stings and paralyzes the pupa and lays an egg inside the pupal case. After hatching, the larval parasitoid kills and consumes the fly pupa before emerging as an adult. These parasitoids do not bother humans, livestock, or poultry and generally go unno-

ticed. Although parasitoids occur naturally, many producers release commercially produced colonies to augment the population and thus improve fly suppression.

Predators

Predators attack and kill several fly stages, including the egg, larva, and adult. The fly stage attacked is dependent on the predator. Beetles, mites, and spiders are the most important predators. At present, predators are not as readily available from commercial insectaries as are parasitoids.

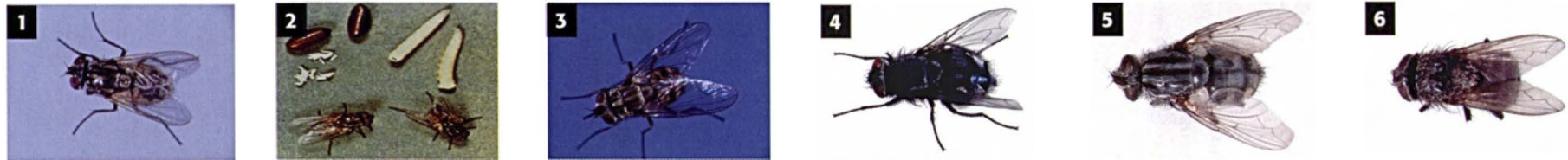
Pathogens

Pathogens that attack flies are probably the least understood beneficial organism, but they occur naturally on all farms. Pathogens, primarily species of fungi and bacteria, usually kill adult flies but have also been recovered from dead fly pupae. These organisms are most effective under moist, dark, warm conditions. One such pathogen, *Entomophthora muscae*, can reach epizootic status in adult house flies, virtually wiping out the fly population on a farm.

Nonpest Flies

Other flies often associated with livestock and poultry facilities include blow flies, flesh flies, cluster flies, soldier flies, and rat-tailed maggots. Although they can breed on farms, blow flies, flesh flies, and cluster flies also breed in large numbers in nonagricultural environments. Soldier flies and rat-tailed maggots are associated with agricultural operations, but their adult stages are generally not considered to be pests.

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Common Pests

Common Name	Species Name	Photo Number(s)	Life Cycle (egg to adult)	Breeding Habitat for Immatures	Adult Life Span	Adult Dispersal
House fly	<i>Musca domestica</i>	1, 2	10 to 21 days	moist organic matter, animal droppings, manure piles, decaying silage, spilled feed, soiled bedding	30 days	generally <0.5 mile, up to 20 miles
Remarks: potential disease transmission, dispersal to neighbors						
Stable fly	<i>Stomoxys calcitrans</i>	3	21 days	wet straw and manure, spilled feeds, silage, grass clippings, decaying vegetation; does not breed in poultry manure	20 to 30 days	20 miles, probably more
Remarks: blood feeding causes decrease in animal performance/production; typically bites lower leg/ankle; foot stomping good indication of fly presence						
Blow fly, several species	<i>Phanicia sericata</i> , <i>Phormia regina</i>	4	10 to 25 days	carrion, animal droppings, wounds, garbage containing meat scraps	adults live approximately 35 days	unknown
Remarks: larvae often found in sites contaminated with milk or broken eggs						
Flesh fly, several species		5	14 to 18 days	carrion, animal droppings, wounds, or decaying vegetation	unknown	unknown
Remarks: flies generally deposit larvae rather than eggs on breeding substrate						
Cluster fly	<i>Pollenia rudis</i>	6	27 to 39 days	parasitizes earthworms	unknown	unknown
Remarks: large numbers of adult flies enter houses and barns during fall to overwinter						



Beneficial Species

Common Name	Species Name	Photo Number(s)	Life Cycle (egg to adult)	Pests Attacked	Breeding Habitat for Immatures	Adult Life Span	Adult Dispersal
Parasitoids, several species	<i>Muscidifurax raptor</i> , <i>Nasonia vitripennis</i> , <i>Spalangia cameroni</i>	7, 8	14 to 28 days	house fly, stable fly, blow fly pupae	livestock and poultry facilities, compost piles	7 to 14 days	probably <100 ft.
Remarks: available through commercial insectaries; photo #7: <i>M. raptor</i> parasitoid on house fly pupa; photo #8: house fly pupal cases with round parasitoid escape holes							
Predators, several species	Beetles (<i>Carcinops pumilio</i> , rove, ground), Mites (<i>Macrocheles muscadomesticae</i>), Spiders	9 10 11	generally four to six weeks	egg, larval, and adult fly stages	generally anywhere prey is available	one to three months	adult beetles capable of flight, immature beetle and other predator dispersal limited
Remarks: adult and immature often predaceous on pest species							
Pathogens	<i>Beauveria bassiana</i> , <i>Entomophthora muscae</i> (not shown)	12		adult house flies	infests immature and adult flies	influenced by physical and environmental conditions	
Remarks: several yards from fly cadaver							



Other Common Flies

Common Name	Species Name	Photo Number(s)	Life Cycle (egg to adult)	Breeding Habit for Immatures	Adult Life Span	Adult Dispersal
Soldier fly	<i>Hermetia illucens</i>	13, 14	2 to 12 months	animal manure and sewage, occasionally found in decaying organic material	unknown	weak fliers
Remarks: larval habits in poultry manure reduce suitability for fly breeding; adults may be found in chimneys; photo #14: larva and adult						
Rat-tailed maggot	<i>Eristalis tenax</i>	15, 16	about 30 days in summer	highly polluted liquid environments such as dairy, swine, and poultry manure lagoons; silage seeps; decaying animal carcasses; and poorly kept drains	unknown	unknown
Remarks: during mass migrations maggots may find their way into barns, milking parlors, or homes; photo #16: larva and adult						

Managing Pest Fly Populations

House fly and stable fly populations can be successfully managed on livestock and poultry facilities by using the photographs and information provided in combination with the pest management guidelines listed in the references below.

Suggested References

- Kaufman, P. E., D. A. Rutz, and C. W. Pitts. 2000. *Pest Management Recommendations for Sheep, Goats, and Swine*. University Park, Pa.: Cornell and Penn State Cooperative Extension Publication. 8 pp.
- Kaufman, P. E., D. A. Rutz, and C. W. Pitts. 2000. *Pest Management Recommendations for Horses*. University Park, Pa.: Cornell and Penn State Cooperative Extension Publication. 8 pp.
- Kaufman, P. E., D. A. Rutz, and C. W. Pitts. 2000. *Pest Management Recommendations for Poultry*. University Park, Pa.: Cornell and Penn State Cooperative Extension Publication. 15 pp.

New York State Integrated Pest Management Livestock and Field Crops home page:
www.nysaes.cornell.edu/ipmnet/ny/livestock/.

- Rutz, D. A., and C. W. Pitts. 1999. *Pest Management Principles for the Pesticide Applicator*. Cornell University and Penn State University. Ithaca, N.Y.: Cornell University. 132 pp.
- Rutz, D. A., C. J. Geden, and C. W. Pitts. 1994. *Pest Management Recommendations for Dairy Cattle*. Cornell and Penn State Cooperative Extension Publication. University Park, Pa.: Penn State University. 12 pp.
- Waldron, J. K., D. W. Watson, P. E. Kaufman, and D. A. Rutz. 2000. *Integrated Fly Management around Confined Livestock*. Video. Ithaca, N.Y.: Cornell Cooperative Extension.
- Watson, D. W., J. K. Waldron, and D. A. Rutz. 1994. *Integrated Pest Management of Flies in and around Dairy and Livestock Barns*. Fact sheet. Ithaca, N.Y.: Cornell Cooperative Extension.

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