

The instructions for use of the recommended insecticides are not as comprehensive as the pesticide labels and are intended to be used as guidelines only. Before using any pesticide, READ THE LABEL for more specific instructions. Many insecticides are sold under brand names not listed in this publication. Further information about the biology and control of insect pests of lactating dairy animals can be found in publications ENT 4 "Cattle Backrubbers, ENT 36 "Fly Control Around Dairy Farms", ENT 37 "Insect Pests of Dairy Cattle" and ENT 42 "Dust bags for Cattle Insect Control".

House Fly and Stable Fly Control on Dairy Farms

House flies and stable flies are the two primary fly species associated with dairy buildings. Successful house fly and stable fly control can only be accomplished by instituting an integrated fly control program. This type of program utilizes a variety of fly control methods based on a knowledge of pest biology and habits, proper sanitation/manure management and timely applications of insecticides.

Sanitation is the key to any successful fly control program since it removes fly breeding sites. Without proper sanitation, chemical control treatments will be of limited success. Manure should be removed from barns, loafing sheds and especially calf pens at least twice per week during the fly breeding season. It should be spread thinly on crop land with a flail type manure spreader so that it can dry. Manure may also be stored in lagoons or liquid manure pits; however, the liquid manure should be agitated to prevent the breeding of rattailed maggots. Thorough removal of manure from corners, around posts and under feed bunks is necessary to prevent fly breeding in these areas. Rotting hay or straw, silage or other spilled feeds should also be cleaned up regularly. Leaking watering troughs and plumbing should be repaired as needed.

Residual fly sprays should be applied to fly resting areas in barns and loafing sheds to control adult flies. Insecticides applied as space sprays, mists or fogs may be used to provide rapid knockdown of adult flies but have no residual activity and will only control flies present at the time of application. Fly baits also are useful supplements to sprays and sanitation. Feed additives will aid in preventing fly breeding (primarily house flies) in the manure from animals being fed the larvicide. Feed additives should not be relied upon for total fly control.

Larvicides can be applied directly to maggot-infested manure as a means of temporarily reducing fly numbers when sanitation and manure management cannot be used. Rabon 50WP or Ravap EC at the rate of 1 gal of finished spray per 100 ft sq of surface. See label for mixing instructions. Treat only "hot spots" containing large numbers of maggots if possible. Do not spray manure where runoff to soil or water can occur. Do not spray animals with these concentrations.

Screening and other mechanical control methods are invaluable in preventing flies from entering milk rooms and milking parlors. Air curtains are also of some use in keeping flies from entering these areas.

Fly traps can capture large numbers of house flies but generally do not reduce their numbers significantly. Ultraviolet light traps, bottle traps, and fly sticky strips can be useful, particularly in the milk room where pesticide applications are limited and fly numbers are low. The solution to severe fly problems lies in finding and treating or eliminating breeding sites.

Fly parasite release programs Several commercial firms offer a fly parasite release program that can be used to supplement fly control around concentrated livestock operations. These small wasp parasites lay their eggs in the larvae or pupae of house flies. The benefits of a parasite release programs in livestock operations have not been proven. If you try them, include sanitation and chemical treatments with these parasite releases probably will be essential. See ENTFACT 502 for more information.

Rattailed maggots live in highly polluted water such as livestock lagoons and manure pits. Mature larvae crawl away from the area in which they developed to dry places so that they can transform to the adult stage, a fly. They become pests when they enter milking parlors or milk rooms. An application of Ravap to the manure pit may provide very limited control. The crawling larvae will stop in a row of dry soil placed in their path. The soil and

maggots can be shoveled up and discarded. See ENTFACT 500 for more information.

Fly control in Milk Rooms

Insecticide	Rate
Pyrethrins + piperonyl butoxide	Ready-to-use
Vapona Farm Strips (20%)	1 strip/1,000 cu. ft.

Pesticides must be used with extreme caution in milk rooms to avoid illegal residues in milk. Nonchemical means such as good sanitation, tight-fitting, spring-loaded screen doors and windows, sticky fly strips, and ultraviolet traps are preferred methods of control supplemented by a comprehensive fly management program in the dairy barn. When pesticides are used, cover milk, milking utensils, bulk tanks and other containers before spraying. Follow label directions and check with your local milk inspector before using any pesticide in the milk room area.

Residual Fly Sprays (excluding milk rooms)

Insecticides may be applied as residual surface sprays, non-residual space sprays, baits, manure sprays, or feed additives. Always read and follow label instructions before applying insecticides for fly control. Treat walls, ceilings, posts, and other fly resting sites. Spray these areas thoroughly and to the point of runoff. In order to minimize control failures due to insecticide resistance, do not apply the same insecticide, or insecticide within the same chemical class (particularly pyrethroids), repeatedly throughout an entire season. See product labels for use rates. In order to minimize control failures due to insecticide resistance, do not apply the same insecticide or insecticide within the same chemical class repeatedly throughout an entire season. Alternate applications of pyrethroids (permethrin) and organophosphates (stirofos, fenthion).

Pyrethroid Insecticides	Organophosphate Insecticides
cyfluthrin- Countdown 2 E or Countdown 25% WP	fenthion-Baytex 4 45% EC
lambda cyhalothrin- Grenade 10% WP	naled - Fly Killer D
permethrin- Atroban 11% EC; Ectiban 5.7% EC or 25% WP; Permethrin II 10% EC (and others)	stirofos-Rabon 50% WP stirofos + vapona- Ravap EC
Spinosyn	
spinosad - Elector 2.46% L	

Note: Remove animals from barn before spraying. Allow at least four hours for spray to dry before allowing cows to return to the barn. Application may be made to walls ceilings, partitions, posts, and other fly resting areas. Do not contaminate feed, water or milking equipment and do not apply these materials in the milk room. These same materials may also be applied onto fly resting areas outdoors. Apply one gallon of spray solution per 500 to 1,000 square feet. Residual fly spray materials listed above should control flies for 1-7 weeks.

Baits can provide temporary reduction of house flies but baits alone will not control fly populations. Never use baits where cattle or other animals can eat them. They should be used along with sanitation and other insecticidal methods (e.g., residual and space sprays). Read the label for further instructions.

Fly Baits

Active Ingredient Insecticide	Insecticide	Chemical Class
imidacloprid	Quick Bayt	neonicotynyl
methomyl	Apache, Fatal Attraction, Golden Malrin Fly Bait Plus, Tailspin	carbamate
trichlorfon	Dipterex	organophosphate

Contact Sprays, Fogs or Space Sprays	Rate
Pyrethrins + Piperonyl butoxide OR Pyrethrins + Piperonyl butoxide +MGK 326 Repellent	Ready-to-Use 1 to 2 fl oz./1,000 ft ³
Ectiban 5.7% EC or Permethrin II 10% EC	
Vapona 23.4% EC (dichlorvos) Vapona 1% OS	1 qt/6 gal water Ready-to-use

Pyrethrins + Piperonyl butoxide: Apply as fog for 1-2 oz. or 1-2 seconds/1000 cu ft when adult flies are present. Keep room closed 15 minutes following application. Use as necessary. Ectiban and Permethrin: Apply with a mist sprayer onto 1,000 sq ft of surface.

Fly Control on Animals -Stable Fly, Horn Fly, and Face Fly

Dust bags Co-Ral 1% D, 3% Rabon or 0.25% Ectiban, Insectrin, Permethrin D may be used. Dust bags are most effective when set up in a forced-use situation such as at the exit to milking parlors, across barn doors, entrances to watering sites and on feeders. For more information see publication ENT-42 "Dust bags for Cattle Insect Control".

Insecticide for Back Rubbers and Face Rubbers	Amount per 1 gal of fuel oil (mixing ratio insecticide : fuel oil)
Co-Ral 11.6% EC (coumaphos)	1-1/4 cups (1:13)
Atroban 11% EC, Delice PO, Ectiban 5.7% EC, Expar 11% EC, GardStar 40% EC, Insectrin 10% EC, Permethrin II 10% EC (permethrin)	Varies with formulation, see label.
Ravap 28.7% EC (stirofos + dichlorvos)	5 fl oz in 1 gal

Use only No. 2 diesel oil, No. 2 fuel oil, or label-recommended mineral oil to dilute concentrate. Do not use waste oil or motor oil. Use one gallon of oil solution per 20 ft of backrubber. Do not use these dilutions as sprays. As with dust bags, these devices are most effective when placed in force-used areas such as milking room exit doors and entrances to watering sites.

Insecticide for Animal Sprays	Amount/25 gal water
Atroban 11% EC, Expar 11% EC, GardStar 40% EC, Hardhitter, Insectrin 10% EL, Permethrin II (permethrin)	See product label for dilution and application rates.
spinosad - Elector 2.46% L	10 fl oz / 5 gal
Pyrethrins + synergist	Ready-to-Use
Ravap 28.7% EC (stirofos + dichlorvos)	See label. Do not apply to teats of lactating animals. Do not treat calves less than 6 mo old. Apply at least 20 min before or after milking is completed.

Spray lactating cows after milking. Do not contaminate feed, water, milk, or milking equipment.

Pour-On Insecticides

Several products containing the active ingredient permethrin may be used on lactating dairy cattle. Examples include Atroban Boss, Brute, CyLence, DeLice, Expar, and Permethrin CDS. Other labeled pests include lice and stable flies.

Insecticide Impregnated Ear Tags for Lactating Dairy Cattle (number of tags per animal)

Synthetic Pyrethroid Tags (P)	Combination Tags P + OP
Atroban/Atroban Extra/Apollo/Deckem/ Ear Force/Expar Extra/Gard Star/ New Z Permethrin/Permethrin Insecticide Ear Tags (10% permethrin) (2)	Max-Con (cypermethrin + chlorpyrifos) (2)
CyLence Ultra (8% beta-cyfluthrin)	
Ectrin and others (8% fenvalerate) (2)	Organophosphate Tags (OP)
Cutter Gold (10% cyfluthrin) (2)	Commando (ethion) (2)
PYython/ZetaGard (zeta-cypermethrin) (1)	Cutter Blue (20% fenthion) (2)

Insecticide ear tags can provide good control of horn flies and may provide some reduction in face fly numbers. Horn fly resistance to the synthetic pyrethroid permethrin has become a significant problem in Kentucky. See ENTFACT 501. Install tags after flies first appear in the spring (late May or early June). Use on calves and mature cattle. Remove tags at the end of the fly season (Sept or Oct). If insecticide resistance is suspected, or if pyrethroid ear tags were used the previous year, organophosphate (OP) tags (Cutter Blue) are recommended or switch to other control devices such as dust bags or sprays. Organophosphate ear tags effectively control pyrethroid-resistant horn flies but are somewhat less effective against face flies.

Bolus and Feed Additives for Pasture Fly Control

Bolus Vigilante 9.7% (diflubenzuron) is available for fly control. The active ingredient is gradually released from the bolus and prevents development of face fly and horn fly larvae in manure. Use standard balling gun. For best results, all cattle in herd should be treated. See the product label for dosage rates.

Feed additives target fly maggots breeding in fresh animal manure. Research results indicate that results can be very variable. All animals must eat a minimal dose of a feed additive regularly. Supplementary control measures must be taken to deal with flies moving in from nearby herds. Moorman's 0.02% IGR Cattle Mix (methoprene) at the rate of 1/4 to 1/2 pound per 100 lbs body weight per month or Rabon 7.76% Premix or 97.3% Oral Larvicide (stirofos) fed at the rate of 70 milligrams of active ingredient per 100 lbs body weight per day may reduce numbers of some flies on cattle.

Lice and Tick Control

Insecticides listed for Animal Sprays can be used to control lice and ticks. In addition, Taktic 12.5% EC (amitraz) can be used at the rate of 1 qt per 100 gal water. The Pour On insecticides Atroban, Delice, Boss, Cyience, and Elector can be applied to control cattle lice.

Cattle Grub Control on Non-lactating Dairy Cattle

Eprinex is the only insecticide labeled for cattle grub control on lactating dairy cattle. The following insecticides can be used to control cattle grubs on dry cows, replacement heifers and bulls. If you treat dry pregnant cows be sure to observe and follow all waiting periods. If a treated cow should come fresh before the waiting period is up, it will be necessary to discard her milk until the required time has passed. Whenever the below-listed systemic insecticides are used as pour-ons or as a spot-on, the weights of the cattle must be estimated or measured to accurately determine the amount of insecticide to be used on the animal being treated. **DO NOT** use more insecticide than is recommended on the label. **READ THE LABEL COMPLETELY BEFORE USING ANY INSECTICIDE.** **DO NOT** use systemic insecticides in conjunction with organophosphate wormers such as Baymix (coumaphos) or Loxon (haloxon).

Pour-ons Insecticide	Amount/100 lbs body wt	Days to freshening
Co-Ral 4% OS	½ fl oz Ready-to-Use	14 Do not exceed 4 oz/animal
Eprinex (eprinomectin)	1 ml / 22 lbs	0 - can be used on lactating animals
Neguvon 8% OS	½ fl oz Ready-to-Use	7 Do not exceed 4 oz/animal
Tiguvon 3% OS	½ fl oz Ready-to-Use	28
Warbex 13.2% OS	½ fl oz Ready-to-Use	21 Do not exceed 4 oz/animal
Spot-ons Spotton 20% OS	See Label	Do not treat breeding age cows
Sprays Co-Ral 25% WP or 11.6% EC	12-16 lb or 3 gal/100 gal water	Do not treat dry pregnant cows within 14 days of freshening

Co-Ral Spray: Apply spray to animals using a high-pressure sprayer in order to soak the skin as well as the hair.

Chorioptic Mites cause a condition known as barn itch or tailhead mange. Taktic (amitraz) or products listed above for fly control on animals that contain permethrin as the active ingredient can be used. Two treatments 7 to 10 days apart, or as directed by the label, are necessary for control. Eprinex is labeled for control of chorioptic mange mites with no withholding period for the milk or slaughter.

Wound maggots Catron IV (permethrin) can be used to protect wounds on dairy cattle. Use as directed.

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