

# ANIMALS

## FLY CONTROL IN LIVESTOCK FACILITIES

Dairy Barns, Swine Barns, Livestock Sheds, Other Animal Buildings

Rev. 4/06

Gene Burgess

### RESIDUAL AND BAIT SPRAYS<sup>1</sup>

INSECTICIDE <sup>2</sup>	SPRAY CONCENTRATION & MIXING INSTRUCTIONS	METHODS OF APPLICATION AND SAFETY RESTRICTIONS
1. cyfluthrin (Countdown, Tempo) 24.3% EC, 20% WP, SPY, HE	Mix 9.5 grams or 19 grams of 20% WP or mix 16 ml of 24.3% EC in sufficient water to cover 1000 ft. <sup>2</sup>	Direct as a coarse, wetting spray to surfaces in livestock facilities where flies congregate, such as ceilings, walls, fences, posts, and manure. Apply to point of runoff (1 gal. per 500 to 1000 ft. <sup>2</sup> ). Do not contaminate feed, drinking water, milk or milk handling equipment. Do not apply as a space spray. Do not apply directly to animals. Repeat as needed. For baited solutions add 1 lb. of sugar per gal. of spray. Remove animals before spraying and return them when spray dries.
2. diazinon (Dryzon) 50% WP, OP, LE	Residual Spray: Mix 2 lbs. or 4 lbs. of 50% WP in 25 gals of water. To make a bait spray mix 1 lb. of sugar or 2 cups of syrup or molasses in the spray mixture.	Remove animals from buildings or corrals prior to treatment and keep animals out until dry. Do not apply in dairy barns, milk rooms and poultry houses. Apply 1 gal. of residual spray as an overall spray at the rate of 1 gal. per 350 to 750 square feet to ceilings and walls of livestock sheds, calf barns, hog barns, loafing sheds and other farm buildings. See restrictions for cyfluthrin in #1 above.
3. dimethoate (Cygon, Residual Fly Spray) 2 lbs. (23.4%) a.i. per gal. EC, OP, HE	1% spray. Mix 1 gal. of 2 lbs. per gal. EC in 25 gals of water	See methods of application and safety restrictions for cyfluthrin (#1) above. Do not apply in milk rooms.
4. fenvalerate (Ectrin) 10% WDL, SPY, HE	Mix 1 qt. of 10% WDL in 10 or 25 gals. Of water. (Longer residual results from higher concentration).	See methods of application and safety restrictions for cyfluthrin (#1) above. For spraying horse barns and swine buildings only. Repeat in 14 to 30 days if needed. Spray ceilings, walls and walkways. Do not treat horse barns if horses are intended for slaughter.
5. malathion (Cythion) 5 lbs. a.i. per gal. premium grade 57% EC, OP, LE	Mix 1 qt. EC in 12 gals. of water	See methods of application and safety restrictions for cyfluthrin (#1) above. Remove lactation dairy animals and all animals under 1 month of age before treating.
6. Permethrin (Atroban, Bear Cat, Ectiban, Gardstar, Insectrin, Overtime, Permaban, Permethrin) 5.7% EC, 11% EC, 40 % EC or 25% WP, SPY, HE	5.7% EC is ready-to-use as a mist spray OR mix 1 qt. 5.7% EC in 12.5 gals. of water OR mix 6.67 ozs. 25% WP in 10 gals. of water OR mix 1 pt. 11% EC in 10 gals. of water OR mix 90 to 118 ml. 40% EC in 10 gals. water.	Apply as a residual surface spray to fly resting areas. Do not spray manure or litter. Do not apply directly to livestock or poultry. Do not apply in milk rooms or egg storage areas. Apply 5.7% EC undiluted at 4 ozs. per 10000 sq. ft. of surface areas or apply diluted WP and EC mixtures at 1 gal./750 sq. ft. Do not apply more often than once every 2 weeks.
7. Spinosyn Elector (2.46% Spinosad)	Dilute 20 oz. (Approx. 600 ml) to 5 gal. water to give 0.08% spinosad	Spray fly-inhabiting surfaces in animal premises to the point of runoff. Use approx. 1 gal. of spray per 500 to 1,000 sq. ft. Repeat as needed, but not more often than once per week. Spray in early morning when flies are resting. Lactating and non-lactating dairy and beef cattle may be present at a time of premise treatment; horses not intended for human consumption may be present during premise treatment. Do not use in poultry, swine, or sheep facilities when animals are present; allow surfaces to dry completely before readmitting animals.
8. tetrachlorvinphos, stirofos, (Rabon) 50% W, OP, LE	1% or 2% spray. Mix 4 lbs. or 8 lbs. WP in 25 gals. of water.	See methods of application and safety restrictions for cyfluthrin (#1) above.

## FLY CONTROL IN LIVESTOCK FACILITIES (continued)

INSECTICIDE <sup>2</sup>	SPRAY CONCENTRATION & MIXING INSTRUCTIONS	METHODS OF APPLICATION & SAFETY RESTRICTIONS
9. tetrachlorvinphos, stirofos, 2 lbs. a.i. per gal. (23%) + dichlorvos 0.5 lb. a.i. per gal. (5.7%) (Ravap) EC, OP, HE	1.25% to 2.5% spray. Mix 1 gal. or 2 gals. EC in 25 gals. or water.	See methods of application and safety restrictions for cyfluthrin (#1) above.
10. trichlorfon (Dipterex) 80% SP, CR, LE	Mix 1 pound of 80% SP in 8 gals. Of water.	Apply 1 gallon/500 sq. ft. Remove animals before treatment. Allow spray to dry before returning animals. Do not contaminate water, feedstuffs, feed handling equipment, or milk handling equipment. See methods of application and safety restrictions for cyfluthrin (#1) above.
<b>SPACE SPRAYS (Aerosols, Fogs and Mist Sprays)<sup>3</sup></b>		
11. dichlorvos (Vapona or DDVP) 1% Ready-to-use Animal Spray Solution OR 2 lbs. a.i. per gal. (23.4%) EC, OP, LE	0.5% or 1%. Apply ready-to-use fogging solution or mix 1 pt. EC in 3 gals. or 6 gals. Of water.	Apply 1 pt. of 1% solution or 1 qt. or 0.5 % solution per 8,000 cubic ft. as a fog or mist. Repeated applications will provide adult fly suppression. Do not use more often than once every 24 hours. Do not use if animals have been treated with other insecticides within 8 hours. Do not apply directly to animals. Close all doors and windows when fogging. Do not contaminate feed, water, milk or milking equipment.
12. permethrin (Gardstar, Insectrin) 5.7% EC, 40% EC, SPY, LE	Mix 1 pt. of 5.7% EC in 5 1/4 gals. of diesel fuel or mineral oil OR mix 10 to 45 ml in 1 gal. of water.	Apply fog at 2 to 4 fl ozs per 1000 cubic feet of air space in confined facility. Repeat as needed.
13. pyrethrin (0.1 to 1.0%) + Synergist (0.5 to 5.0%) NPY, HE	Ready-to-use.	Apply fogs or spray mists at 1 fl oz per 1,000 cu ft as fine atomized spray. Repeat as needed.
<b>BAITS</b>		
14. Imidacloprid 0.5% QuickBayt	Ready-to-use.	Scatter bait directly from container onto dry level surfaces so individual granules lie near each other without forming piles. Or place in any commercial bait station. Or mix 1.5 oz. Bait with 1 fl. oz. Warm water and stir to create a paste; apply with brush to surfaces where flies rest. Bait should be inaccessible to food-producing animals, children and pets.
15. methomyl (Apache, Golden Malrin) Bait, CR, HE	Ready-to-use as a dry bait.	As a dry bait: Scatter on floors, walkways, etc., throughout operation but away from animals. Apply heavy (about 1/4 lb per 500 to 1000 sq ft) until flies are suppressed. Wear rubber gloves when applying baits. Do not allow workers on treated floors without shoes. Do not allow animals to come in contact with baits.
16. nithiazine (QuikStrike) 1% fly abatement strip	Ready-to-use strip.	Hang one strip per 100 ft. <sup>2</sup> or 300 ft. <sup>2</sup> depending on fly population in enclosed areas that are protected from rain.

<sup>1</sup> Residual sprays can be applied as spot sprays to control maggots in manure accumulations if permitted by the EPA label.

<sup>2</sup> HE = highly effective, LE=less effective or effectiveness not established, OP=organophosphate, CR=carbamate, SPY=synthetic pyrethroid, NPY=natural pyrethrum, CH=organochlorine, chlorinated hydrocarbon, SP= soluble powder.

<sup>3</sup> Space sprays are designed to kill only adult flies that are present when the fog or mist is applied. There is little or no residual insecticide deposit remaining after the application. Fogs or mists must come in contact with the fly. These materials are especially effective in enclosed areas where air movement is minimal. Heavy mists can offer good adult fly kill in open areas such as in feed lots.

# BEEF CATTLE EXTERNAL PERASITE AND GRUB CONTROL

Gene Burgess

Before applying any insecticide to beef cattle, refer to the Table, "Insecticides to Use and Ways to Apply Them to Control Beef Cattle Pests," and determine if the insecticide can be used safely. To use the insecticide table, first select the pest to be controlled. Find this in the left margin of the table. Next, move to the method of application desired (spray, dust, etc.). Each insecticide is designated by capital letters and the various formulations of each insecticide are as shown by numbers (C1, C2, C3, etc.). Use only one insecticide at a time from the table. Now, refer to the Table, "Insecticide Mixing and Application Instructions and Use Restrictions," for the proper mixing instructions and the correct application instructions and use restrictions. Since costs vary, consult County Extension "Service personnel or your pesticide dealer for the most effective insecticide for the money.

Be sure to observe all precautions on insecticide labels to prevent injury to animals and humans and to prevent illegal insecticide residues in beef and beef by-products.

## INSECTICIDES TO USE AND WAYS TO APPLY THEM TO CONTROL BEEF CATTLE PESTS

Beef Cattle Pests	Sprays	Dusts	Ear-Tags <sup>1</sup> and Dust Bags <sup>1</sup> (Self-Treatment)	Backrubbers <sup>1</sup> and Facerubbers <sup>1</sup>	Injectable <sup>2</sup> Pour-on <sup>2</sup> Spot-on <sup>2</sup>	Bolus <sup>4</sup> Feed Additives	Dips
<b>Horn Flies</b>	B1, B2, F1, N1, Q2, Q7, Q8, R1, T1, U2, U3, V1	B5, N2, Q4, V2, W2	B4, B6, D1, E1, E2, E3, E4, E5, H1, J1, K1, M1, M2, Q1, S1, V2, V3, V4, W1	B3, B4, H3, Q3, U1	C1 I1, L2, M3, Q5, Q6	G1, O1, V5	
<b>Cattle grubs</b>	B1, B2				A1, A2, B1, I1, I2, N1		
<b>Cattle lice</b>	A1, B1, B2, F1, H1, N1 Q2, Q7, Q8, R1, T1, U2, U3, V1	B5, N2, Q4, V2, W2	B4, E5, J1, Q4, V3, W1	B3, H3, N1, Q3, U1	C1, H1, I1, L1, L2, M3, P1, P2, Q5, Q6		
<b>Face Flies<sup>3</sup></b>	F1, Q1, Q5, Q7, T1		B6, D1, E1, E2, E3, E4, E5, J1, K1, M1, M2, Q1, S1, V3, V4, W1	B3	C1	G1, O1, V5	
<b>Ticks<sup>3</sup></b>	A1, B1, B2, N1, Q2, Q7, Q8, R1, U2, U3, V1	N2, R2	B6, D1, E1, E2, E3, E4, E5, J1, K1, M1, Q1, Q4, S1, V4, W1	B3, Q3, U1	Q5, Q6		B2
<b>Stable flies<sup>3</sup></b>	F1, N1, Q2, Q7, Q8, T1	N2	D1, E1, E2, E3, E4, E5, J1, K1, M1, M2, Q1, S1, W1	Q3	M3, Q5, Q6		
<b>Maggots in wounds</b>	B2	B5					
<b>Horse flies, deer flies, mosquitoes, black flies<sup>3</sup>, eye gnats</b>	F1, Q2, Q7, Q8, T1		Q4		Q5, Q6		
<b>House flies<sup>3</sup></b>	F1, Q2, T1, W2		D1, E1, E2, E3, E4, E5, J1, K1, M1, M2, Q1, S1, W1		Q5, Q6	V5	
<b>Mites, Scabies<sup>3</sup> (Psoroptic, Chorioptic, Sarcoptic)</b>	A1, Q2, R1				C1, H1, I1, L1, L2, P1, P2, Q5, Q6		A2

1 Use of insecticide ear tags, self-treatment dust bags, facerubbers and backrubbers may control or aid in the control of lice, face flies, ticks, stable flies, mosquitoes, black flies, deer flies and horse flies.

2 Systemic injectables, spot-on and pour-on materials aid in controlling horn flies, lice, and other blood sucking external parasites.

3. Desirable control of face flies, stable flies, horse flies, deer flies, mosquitoes, house flies, ticks and mites is difficult to obtain. Most of the insecticides applied to control horn flies will control or aid in the control of these pests if applied thoroughly.

4 Boluses aid in reducing face flies and stable files.

5 See ear tag insecticide classes and rotation recommendations to delay resistance and prolong effectiveness.

## BEEF CATTLE INSECTICIDE MIXING AND APPLICATION INSTRUCTIONS AND USE RESTRICTIONS

Gene Burgess

INSECTICIDE FORMULATION AND MIXING INSTRUCTIONS	APPLICATION INSTRUCTIONS AND RESTRICTIONS <sup>1,2,3</sup>
<p>A. AMITRAZ</p> <p>(A1) Taktic 12.5% EC Mix 1 qt. 12.5% EC in 100 gals. of water. Use within 6 hours of mixing.</p>	<p>Apply up to 2 gals. of spray for a fully grown animal. Penetrate spray to skin until run-off. Pay particular attention to legs, udder, tail regions, head, ears, shoulder area and neck. A second application may be needed to control lice 10 to 14 days later. Waiting period: 0 days.</p>
<p>(A2) Taktic 12.5% EC Mix 1 qt. 12.5% EC in 50 gals. of water. Use within 6 hours of mixing.</p>	<p>Apply in a spray dip machine as instructed by USDA, APHIS in mange mite (scabies) control. A second application is required 7 to 10 days later. Waiting period: 0 days.</p>
<p>B. COUMAPHOS (Note: Co-Ral Emulsifiable Livestock Insecticide ELI 11.6% is a Restricted Use Pesticide)</p> <p>(B1) Co-Ral EC Spray. Mix 1.2 oz. 11.6% EC in 4 gals. of water.</p> <p>(B2) Co-Ral Fly and Tick Spray (6.15%)</p>	<p>Wet entire body to skin with high pressure spray (200-400 p.s.i.). Treat during early summer for grub control and no later than 6 weeks prior to expected appearance of grubs in the back. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to contagious and infectious diseases. Do not spray in a confined, non-ventilated area. Do not apply in conjunction with oral drenches or other internal medications nor with natural pyrethrins or synthetic pyrethroids or their synergists or with other cholinesterase inhibitors. Waiting period: 0 days.</p>
<p>(B3) Co-Ral Backrubber Oil. Mix 9.75 oz. 6.15% Fly and Tick Spray in 1 gal. of #2 diesel fuel or #2 furnace oil</p>	<p>Saturate backrubber with 1 gal. per 20 ft. cable. Keep backrubber charged. For best results place so cattle will use daily. Waiting period: 0 days.</p>
<p>(B4) Coumaphos 1% Dust. Ready-to-use.</p>	<p>Apply 4 to 10 lbs. in suspended, self-treatment dust bags. Suspend where animals will treat themselves daily, such as near minerals or salt blocks. Bottom of bag should hang 4 to 6 inches below top line of cattle. Protect duster from weather. Do not apply to sick, stressed or convalescent animals. Repeat as needed. Waiting period: 0 days.</p>
<p>(B5) Coumaphos 1% Dust. Ready-ro-Use.</p>	<p>Apply not more than 2 ozs. of dust per animal. Dust evenly into hair over the head, neck, shoulders, back and tailhead. Do not apply to sick, stressed or convalescent animals. Repeat as needed. Waiting period: 0 days.</p>
<p>(B6) Co-Rat Plus Insecticide Cattle Ear Tag</p>	<p>All mature animals in the herd should be tagged. For optimum control of Horn Flies, Gulf Coast Ticks, and Spinose Ear Ticks, and as an aid in the control of Face Flies, attach one tag to each ear (two per animal). Replace as necessary. Calves less than 3 months of age should not be tagged as ear damage may result. Remove tags at end of season or prior to slaughter.</p>
<p>C. CYFLUTHRIN</p> <p>(C1) Cylence 1% pour on insecticide. Ready-to-use when purchased.</p>	<p>Apply pour-on along the top of the back and top of the head. For horn fly and face fly control apply 4 ml. to animals weighing less than 400 lbs., 8 ml. to animals weighing 400-800 lbs. and 12mls. to animals weighing over 800 lbs. Do not retreat within three weeks following treatment. Double the dose for biting and sucking lice. Waiting period: 0 days.</p>
<p>D. CYPERMEIHRIN</p> <p>(D1) Max-Con insecticide ear tag. (7% cypermethrin + 5% chlorpyrifos + 3.5% piperonyl butoxide). Ready-to-use when purchased.</p>	<p>Attach one tag to the inside of each ear on mature cattle. Remove tags when control drops off, at the end of the fly season or before slaughter. Waiting period: 0 days.</p>
<p>E. DIAZINON</p> <p>(E1) Optimizer 21.4% (Bova-Gard<sup>4</sup>) insecticide ear tag (21.4% diazinon). Ready-to-use when purchased.</p>	<p>Attach one tag to the inside of each ear on mature cattle. Tags should be removed when control drops off, at the end of the fly season or before slaughter. Waiting period: 0 days.</p>
<p>(E2) Optimizer-Calf 21.4% insecticide ear tag (21.4% diazinon). Ready-to-use when purchased.</p>	<p>Attach one tag to the inside of each ear on calves. Remove tags when control drops off, at the end of fly or lice season or before slaughter. Waiting period: 0 days.</p>
<p>(E3) Terminator 20% insecticide ear tag. Ready-to-use when purchased.</p>	<p>Attach one tag to the inside of each ear on mature cattle. Tags should be removed when control drops off, at the end of the fly season or before slaughter. Waiting period: 0 days.</p>

<b>INSECTICIDE FORMULATION AND MIXING INSTRUCTIONS</b>	<b>APPLICATION INSTRUCTIONS AND RESTRICTIONS</b> <sup>1,2,3</sup>
(E4) Patriot 40% insecticide cattle ear tag. Ready-to-use when purchased.	Attach one tag to the inside of one or both ears of mature animals. Remove tags when control drops off, at the end of fly season or before slaughter. Waiting period: 0 days.
(E5) Warrior (Diaphos <sup>4</sup> ) 40% insecticide ear tag (30% diazinon + 10% chlorpyrifos). Ready-to-use when purchased.	Attach one tag to the inside of one or both ears of mature animals. Remove tags when control drops off, at the end of fly or lice season or before slaughter. Waiting period: 0 days.
F. DICHLORVOS  (F1) Vapona EC. Mix 1 qt. 21.8% EC in 6 gals. of water	Apply 1 to 2 fl. ozs. as a light mist spray daily. Spray to cover all parts of the animal. Do not wet the skin. Do not apply more than 2 fl. ozs. per animal each day. Waiting period: 1 day.
G. DIFLUBENZURON  (G1) Vigilante 9.7% bolus. Ready-to-use.	Using standard balling gun administer ½ bolus for cattle weighing 300-550 lbs., 1 bolus for 550-825 lbs., 1½ boluses for 825-1,100 lbs., and 2 boluses for 1,100 lbs., or heavier. Do not administer to cattle weighing less than 300 lbs. Do not administer more than 2 boluses to any animal regardless of weight. Waiting period: 0 days.
H. DORAMECTIN 0.5% (H1) Doctomax pour-on	Apply 1 ml per 22 lb. body weight, along midline of the back between withers and tailhead. Safe for all beef cattle, and replacement dairy heifers to 20 months of age.
I. EPRINOMECTIN  (I1) Ivomec Eprinex pour on for beef cattle. Contains 5 mg. eprinomectin/ml. Ready-to-use when purchased.	Administer pour-on to cattle 8 weeks of age or older. Apply at the dose of 1 ml. per 22 lbs. body weight. Apply pour-on to the top of the animal along the backline from the withers to the tailhead. Waiting period: 0 days.
J. ETHION (J1) Commando 36% insecticide ear tag. Ready-to-use when purchased.	Attach one tag to the inside of both ears of mature animals and calves over 3 months old. Remove tags when control drops off, at the end of fly season, at the end of lice season or before slaughter. Waiting period: 0 days.
K. FENVALERATE  (K1) Ectrin 10% Insecticide Ear Tag. Ready-to-use when purchased.	Attach one tag to the inside of each ear on mature cattle. Remove tags when control drops off; at the end of fly season, or before slaughter. Waiting period: 0 days.
L. IVERMECTIN  (L1) Ivomec (ivermectin) 1% clear, ready-to-use sterile solution.	Administer subcutaneously only 1 ml. (10 mg. ivermectin) per 110 lb. body weight. Restrain animals and inject under the loose skin in front of or behind the shoulder. A sterile, 16-gauge, ½ to ¾" needle is suggested. Divide doses greater than 10 ml between two injection sites to reduce occasional transitory discomfort or site reaction. Waiting period between application and slaughter: 35 days.
(L2) Ivomec (ivermectin) pour-on, ready-to-use. 5 mg ivermectin/ml.	Apply 1 ml. per 22lbs. of body weight. Apply along the topline in a narrow strip from the withers to the tailhead. Waiting period: 180 days.
M. LAMBDCYHALOTHRIN (M1) Saber (Excalibur <sup>4</sup> ) 10% insecticide ear tag (10% lambdacyhalothrin + 13% piperonyl butoxide). Ready-to-use when purchased.	Apply one tag to the inside of each ear on mature cattle or calves. Remove tags when control drops off, at the end of fly season, or before slaughter. Waiting period: 0 days.
(M2) Double Barrel/Double Barrel VP 20.8% insecticide ear tag (6.8% lambdacyhalothrin + 14.0% pirimiphos methyl). Ready-to-use when purchased.	Apply one tag to the inside of each ear on mature cattle or calves. Remove tags when control drops off, at the end of fly season, or before slaughter. Waiting period: 0 days.
(M3) Saber 1% pour-on insecticide. Ready-to-use when purchased.	Apply to beef cattle and calves for lice and horn flies. Apply pour-on down the backline at 10 ml. (1/3 fl. oz.) per animal for cattle weighing less than 600 lbs. or at a rate of 15 ml. (½ fl. oz.) per animal for cattle weighing more than 600 lbs. Repeat as needed but not more often than every two weeks and not more than four applications within a six month period. Waiting period: 0 days.
N. MALATHION  (N1) Malathion EC or WP Spray. Mix 1½ cups of 57% EC or 1½ lbs. (about 5 cups) 25% WP in 10 gals. of water.	Spray animals thoroughly (about 2 qts. per mature animal). Apply every 3 weeks, if needed. Do not treat calves less than 1 month old. Waiting period: 0 days.
(N2) Malathion 4% to 5% Dust. Ready-to-use.	Dust animal thoroughly with about 2 ozs. (2 Tbs.) per animal. Repeat in 2 to 3 weeks, if needed. Do not treat calves less than 1 month old. Waiting period: 0 days.

INSECTICIDE FORMULATION AND MIXING INSTRUCTIONS	APPLICATION INSTRUCTIONS AND RESTRICTIONS <sup>1,2,3</sup>
O. METHOPRENE (O1) Altosid 0.02% mineral mix or block.	Feed free choice at 1/4 - 1/2 lb./100 lbs. animal body weight monthly/animal. Waiting period: 0 days.
P. MOXIDECTIN (P1) Moxidectin 1% injectable. (Cydectin 10 mg/ml)	Inject 1 mg per 110 lb. body weight; 35 day withdrawl.
(P2) Moxidectin (Cydectin Pour-on)	Use 1 mg per 110 lb. body wither (mites and lice).
Q. PERMETHRIN  (Q1) Permethrin 10% Insecticide Ear Tag (10% Permethrin). (Atroban, Deckem, Expar <sup>4</sup> , Gard Star Plus). Ready-to-use when purchased.	Attach one tag to the inside of each ear on mature cattle and calves. Remove tags when control drops off, at the end of fly season, or before slaughter. Waiting period: 0 days.
(Q2) Permethrin EC spray. Mix 1 qt. of 5.7% EC OR mix 1 pt. of 10% EC or 11% EC in 100 gals. water or mix 30 to 118 ml of 40% EC in 25 gals. of water or apply 1% pour-on as an undiluted spray.	Spray animal thoroughly. Re-treat as needed but not more often than once every 14 days. To control lice or mites, a second treatment may be needed 10-21 days later. Waiting period: 0 days.
(Q3) Permethrin Rubbing Mixture. Mix 1 qt. 5.7% EC in 10 gals. diesel fuel or mix 1 pt. 10% or 11% EC in one gal. of #2 diesel fuel or mineral oil or mix 118 ml. 40% EC in 10 gal. of diesel oil or suitable mineral oil.	Keep rubbing device charged. Daily forced use provides best results. Waiting period: 0 days.
(Q4) Permethrin 0.25% dust. Ready-to-use when purchased.	Use in dust bags or apply up to 2 ozs. directly to animals. Re-treat 14 to 21 days later if needed for lice control. Waiting period: 0 days.
(Q5) Atroban Delice/Synergized Expar 1.0% pour on. Ready-to-use when purchased.	Apply 0.5% fl. oz. (15 cc) per 100 lbs. body weight of animal up to a maximum of 5 fl. oz. for any one animal. Pour correct dose along back and down face.
(Q6) Brute Pour-on (10% permethrin) Ultra-Boss Pour-On (5% permethrin)	Apply 15 cc (10%) or 30ccc (5%) per 1,000 lbs. down mid-line of back. Repeat the application in 10 to 14 days for mites. Waiting period: 0 days.
(Q7) Permethrin EC Spray (low pressure). Mix 1 qt. 11% EC in 5 gals. water.	Apply 1 to 2 ozs. spray mixture per animal. Spot treat the back, face, legs and ears. Waiting period: 0 days.
(Q8) Permethrin EC Spray. Mix 1 cup 42.5% EC in 100 gals. water or mix 1 pt. 42.5% EC in 100 gals. water.	Apply 1 qt. of low concentration spray mixture per animal to control horn flies only. Apply 2 qts. of high concentration spray per animal to control all labeled parasites. Repeat treatment as needed but not more than every 14 days. Waiting period: 0 days.
R. PHOSMET (Del-Phos, GX-118, Prolate/Lintox)  (R1) Prolate/Lintox HD. Mix 1 qt. in 25-50 gal. water (depending on target pest), and spray to run-off.	Apply as a coarse high pressure spray to thoroughly wet the skin and hair of the animal. Apply up to 1 gal. per animal. Do not re-treat within 7 days. See restrictions in C1. Waiting period: 3 days.
S. PIRIMIPHOS-METHYL  (S1) Dominator 20% (Rotator <sup>4</sup> ) insecticide ear tag (20% pirimiphos methyl). Ready-to-use when purchased.	Attach one tag to the inside of each ear on mature cattle. Remove tags when control drops off or in the fall whichever occurs first. Waiting period: 0 days.
T. PYRETHRINS (T1) Pyrethrins - synergized. Ready-to-use.	Apply 1 to 2 fluid ozs. daily or as needed. Apply to wet hair not skin. Waiting period: 0 days.
U. STIROFOS + DICHLORVOS (U1) Ravap (1% stirofos + 0.25% dichlorvos) in oil. Mix 5 ozs. 28.7% EC in 1 gal. of #2 diesel fuel.	Pour 1 gal. of mixture per 20 ft. of cable. Keep rubbing device charged. Waiting period: 0 days.
(U2) Ravap (0.35% stirofos + 0.1% dichlorvos) EC spray. Mix 1 pt. 28.7% EC in 10 gals. of water.	Apply as a coarse spray. Apply 1/2 to 1 gal. spray per animal. Do not repeat application within 10 days. Waiting period: 0 days.
(U3) Ravap (0.5% stirofos + 0.1% dichlorvos) EC spray. Mix 1 pt. 28.7% EC in 6 gals of water.	Apply as a coarse spray. Apply 1/2 gal. spray per animal. Do not repeat application within 10 days. Waiting period: 0 days.
V. STIROFOS OR TETRACHLORVINPHOS (V1) Rabon WP spray. Mix 1 Lb. 50% WP in 18 gals. of water.	Apply as a coarse spray. Apply 2 qts. to 1 gal. per animal to obtain complete wetting. Waiting period: 0 days.
(V2) Rabon 3% Dust. Ready-to-use.	Apply 2 ozs. of dust per animal by hand or duster to thoroughly penetrate hair coat. Waiting period: 0 days.

<b>INSECTICIDE FORMULATION AND MIXING INSTRUCTIONS</b>	<b>APPLICATION INSTRUCTIONS AND RESTRICTIONS<sup>1,2,3</sup></b>
(V3) Rabon 3% Dust. Ready-to-use.	Apply in dust bags which are hung and protected from rain in dusting stations where cattle are forced to use them. Some control will be obtained by free choice use. Waiting period: 0 days.
(V4) Rabon 13.7% Insecticide Cattle Ear Tag.	Attach one tag to the inside of each ear of mature cattle. Aids in the control of face flies. Waiting period: 0 days.
(V6) Rabon 7.76% granular oral lavicide. Pre-mix or ready-to-use blocks and mineral feeds are available commercially.	Mix 7.76% oral larvicide with concentrate feed as directed on label. Feed ready-to-use block or mineral free choice so each animal will consume 70 mg./100 lbs. body weight daily. Begin feeding before flies appear in spring. Feed continuously until frost. Must be supplemented to provide effective control. Waiting period: 0 days.
W. ZETACYPERMETHRIN  (W1) Python (Zetaguard <sup>4</sup> ) 10% insecticide ear tag (zetacypermethrin 10% + piperonyl butoxide 20%). Ready-to-use when purchased.	Attach one tag to the inside of each ear on mature cattle. Remove tags when control drops off; at the end of fly or lice season, or before slaughter. During the horn fly season, one tag per animal can be used on cows. Calves can be tagged with one tag as needed. Waiting period: 0 days.
(W2) Python dust (10.075% zetacypermethrin)	Apply up to 2 oz. per animal evenly as necessary but not more often than every 3 days.
(W3) Python Magnum Insecticide Cattle Ear Tag	Ready-to-use. Apply 1 tag per head to the front or back of one ear on each animal to control most strains of horn flies and to aid in the control of face flies, stable flies, and house flies for up to 4 months.

<sup>1</sup> Waiting periods refer to the time interval between the last application of the insecticide and slaughter of beef animals.

<sup>2</sup> Do not treat calves under 6 months of age with insecticides unless specifically allowed on the insecticide label.

<sup>3</sup> Do not treat Brahman cattle with organophosphate insecticides unless specifically allowed on the insecticide label.

<sup>4</sup> Available from Veterinarians.

# DAIRY CATTLE EXTERNAL PARASITE AND CATTLE GRUB CONTROL

Gene Burgess

Before applying any insecticide to dairy cattle, refer to the Table, "Dairy Cattle Lactating and Non-Lactating (Dry) External Parasite Control" and the Table, "Dairy Cattle, Non-Lactating (Dry) Cattle Grub Control Insecticides," and determine if the insecticide can be used safely. To use the insecticide table, first select the pest to be controlled. Find this in the left margin of the table. Next, move to the method of application desired (spray, dust, etc.). Each insecticide is designated by capital letters and the various formulations of each insecticide are shown by numbers (C4, F2, etc.). Use only one insecticide at a time from the Table. Now, refer to the Table, "Dairy Cattle (Lactating and Non-Lactating) External Parasite Control Insecticides," for the proper mixing instructions and the correct application instructions and use restrictions. Since costs vary, consult County Extension Service personnel or your pesticide dealer for the most effective insecticide for the money.

Be sure to observe all precautions on insecticide labels to prevent injury to animals and humans and to prevent illegal insecticide residues in milk and milk by-products.

## DAIRY CATTLE LACTATING AND NON-LACTATING (DRY) EXTERNAL PARASITE CONTROL

PESTS	SPRAYS	DUSTS	FEED ADDITIVES	DUSTS BAGS <sup>1,2</sup> (Self- treatments)	BACKRUBBERS <sup>1</sup> & FACERUBBERS <sup>1</sup>	EAR TAGS <sup>1</sup> AND TAPE	POUR-ON
<b>Horn flies</b>	A2, A4, D1, N1, N2, N3, O1, O2, O3, O4, O5, P2, R1	A1, N7, Q1	E, L, Q3	A3, N6, Q1	A4, N1, N4, R2	A5, B, C, H, I, Q2, S	F, G, M, N1, P1
<b>Face flies</b>	A2, A4, D1, N1, N2, N3, O1, O2, O3, O4, O5	A1, N7, Q1	E, L, Q3	A3, N6, Q1	A4, N1, N4	H, I, Q2, S	
<b>House flies</b>	A2, A4, D1, N1, O1, O2, O3, O4, O5, R1		E, Q3		N1, N4	I, S	
<b>Stable flies</b>	D1, N1, N2, O1, O2, O3, O4, O5, R1		Q3		N1, N4	I,S	
<b>Horse flies</b>	D1, N1, O1, O2, O3, O4, O5				N1, N4		
<b>Mosquitoes</b>	D1, N1, O1, O2, O3, O4, O5, R1	N7		N6	N1, N4, R2		N1
<b>Ticks</b>	A2, A4, N2	A1, A5		A3			N1
<b>Cattle grubs<sup>4</sup></b>							F, G, K, M
<b>Cattle lice</b>	A2, A4, N1, N5, O1, O2, O3, O4, O5, P2	A1, N7, Q1		A3, N6	N1, N4		F, G, K, M, N1, P1
<b>Wound-infesting Maggots</b>	A5	A5					
<b>Mites (Chorioptic)</b>							F, G, K, M

1 To be effective in reducing face fly numbers, cattle must treat face daily. Hang rubbing devices so cattle cannot straddle them.  
 2 Insecticide ear tags will control horn flies and ear ticks and will aid in the control of face flies, stable flies and house flies.  
 3 See ear tag insecticide classes and notation recommendations to delay resistance and prolong effectiveness.

DAIRY CATTLE (LACTATING AND NON-LACTATING)  
EXTERNAL PARASITE CONTROL INSECTICIDES (continued)

## DAIRY CATTLE (LACTATING AND NON-LACTATING) EXTERNAL PARASITE CONTROL INSECTICIDES

Gene Burgess

INSECTICIDE	FORMULATION & MIXING INSTRUCTIONS	APPLICATION INSTRUCTIONS & RESTRICTIONS
A. COUMAPHOS  (A1) Coumaphos Dust OP, ME	Ready-to-use.	Apply not more than 2 ozs. (6 level Tbs.) per animal. Dust into the hair over the head, neck, shoulders, back and tailhead. Do not treat animals in a non-ventilated area. Do not apply to sick, convalescent or stressed animals. Repeat as needed.
(A2) Co-Ral Fly and Tick Spray		Apply specified dosage for a complete wetting to run-off. Treat no more than six times per year. Do not make applications less than 10 days apart. Do not apply as a spray at rates above 1 quart of Co-Ral Fly and Tick Spray per 50 gallons of water to lactating dairy cattle or non-lactating dairy cattle within 14 days of freshening. If freshening should occur within the interval after spraying, do not use milk for human food for balance of 14 day interval. Do not apply to sick, convalescent or stressed livestock or to animals less than 3 months old. Do not spray animals for 10 days before or after shipping or weaning or after exposure to contagious and infectious diseases. Do not spray in confined, non-ventilated area. Co-Ral is a cholinesterase inhibitor. Do not use this product on animals simultaneously or within a few days before or after treatment or exposure to cholinesterase-inhibiting drugs or pesticides. Atropine by injection is antidotal. Consult veterinarian at the first sign of adverse reaction.
(A3) Coumaphos 1% Dust OP, ME		Apply 4 to 10 lbs. in self-treatment cotton cloth or doubled burlap bags. Suspend where animals will treat themselves daily, such as near mineral or salt blocks and in exit of milking barn. Bags should hang 4 to 6 inches below topline of cattle. Protect bags from weather. Do not hang bags over feed, mineral or water troughs.
(A4) Co-Ral Fly and Tick Spray OP, ME	Mix 9 3/4 ozs. of 6.15% in 1 gal. No. 2 diesel fuel or No.2 furnace oil.	Saturate backrubber and facerubber with 1 gal. mixture per 20 ft. of cable. Cattle must use rubbing device daily. Recharge rubbing device at least every 14 days. One 20 ft. backrubber is sufficient for 50 head or fewer cattle. Hang so cattle cannot straddle device. Do not treat calf less than 3 months old.
(A5) coumaphos 20% + diazinon 20% Co-Ral Plus Insecticide Cattle Ear Tag	Ready-to-use	Attach 1 tag per ear, two tags per animal. (> 3 months of age). Non-lactating only.
B. CYFLUTHRIN, Cylence Ultra Insecticide Cattle Ear Tag 8% beta-cyfluthrin	Ready-to-use	Attach 1 tag per ear, two tags per animal (> 3 months of age), including lactating.
C. DIAZINON Cattle ear tags (Z Diazinon, Optimizer, X-Terminator, Patriot)	Ready-to-use	Follow label instructions regarding number of tags per head; remove when effectiveness diminished and at end of season. Beef and non-lactating animals only.
D. DICHLORVOS  (D1) Vapona 1% EC Spray OP, ME	Mix 1 qt. of 2 lbs. a.i. per gal. EC (23.4%) in 6 gals. water.	Apply no more than 2 fls. ozs. daily as a light mist spray to cover all body parts, especially head, back, legs and sides. Do not wet skin, only hair of animal. Do not apply to animals less than 6 months old. Do not apply in combination with trichlorfon.
E. DIFLUBENZURON Vigilante Bolus (4.75 g dimilin)	Ready-to-use Bolus	Administer with standard bailing gun. Controlled-release bolus emits IGR to kill fly larvae in the manure for up to 5 months. Requires no preslaughter withholding time or milk discard time.
F. DORAMETCTRIN 0.5%	Ready-to-use	Apply 1 ml per 22 lb body wt along midline of back between withers and tailhead. Safe for all beef cattle, and replacement dairy heifers to 20 months of age. Applications of macrocyclic lactones will also control blood sucking lice (nymphs and adults). Lice eggs may hatch or untreated cattle may serve as source of reinfestation, requiring retreatment.

DAIRY CATTLE (LACTATING AND NON-LACTATING)  
EXTERNAL PARASITE CONTROL INSECTICIDES (continued)

INSECTICIDE	FORMULATION & MIXING INSTRUCTIONS	APPLICATION INSTRUCTIONS & RESTRICTIONS
G. EPRINOMECTIN 0.5% Eprinex Pour-on	Ready-to-use	Apply 1 ml per 22 lb body wt along midline of the back between withers and tailback. Safe for all beef and dairy (including lactating cattle). Applications of macrocyclic lactones will also control blood sucking lice (nymphs and adults). Lice eggs may hatch or untreated cattle may serve as source of reinfestation, requiring retreatment.
H. ETHION  (H1) Commando Insecticide Cattle Eartags	Ready-to-use.	Attach 1 tag per mature animal; remove at end of fly season and before slaughter.
I. FENVALERATE  (I1) Ectrin 8% Insecticide Cattle Ear Tag PY, ME	Ready-to-use.	Attach one tag to the inside of each ear when flies reach 50 to 100 per animal in the spring. Remove tags when control drops off. Remove tag before slaughter.
J. IVERMECTIN	Injectable	Do not treat cattle within 35 days of slaughter. Because a withdrawal time in milk has not been established, do not use in female dairy cattle of breeding age.
K. Ivermectin 0.5% Ivomec Pour-on	Ready-to-use	Apply 1 ml per 22 lb body wt., along midline of the back between withers and tailhead. Safe for all beef cattle; cattle must not be treated within 48 days of slaughter for human consumption. Do not use in female dairy cattle of breeding age. Applications of macrocyclic lactones will also control blood sucking lice (nymphs and adults). Lice eggs may hatch or untreated cattle may serve as source of reinfestation, requiring retreatment.
L. METHOPRENE  (L1) Methoprene (Altosid) 0.02% feed mixture IGR, LE	Ready-to-use.	Animals should consume 0.25 to 0.5 lb. per 100 lbs. body weight each month. Feed this oral insect growth regulator as free choice mineral or mixed in supplements for pasture cattle early in the spring before horn flies appear. May be used on lactating dairy animals.
M. MOXIDECTIN 0.5% Cydectin Pour-on	Ready-to-use	Pour weight-determined dose evenly along animal's backline from withers to tailhead (basing dose on label weight table). Provides 7 days of activity against horn flies. No pre-slaughter or milk discard interval. Applications of macrocyclic lactones will also control blood sucking lice (nymphs and adults). Lice eggs may hatch or untreated cattle may serve as source of reinfestation, requiring retreatment.
N. PERMETHRIN  (N1) Synergized Delice 1.0% solution PY, ME	Ready-to-use when purchased.	Apply 0.5 fl. oz. (15 cc) per 100 lbs. body weight of animal up to a maximum of 5 fl. oz. for any one animal. <u>Pour-On:</u> Pour correct dose along back and down face. <u>Ready-to-use Spray:</u> Use undiluted in a mist sprayer to apply correct dose. Apply directly to neck, face, back, legs and ears. <u>Back rubber use:</u> Mix one pint per gal. of #2 diesel fuel or mineral oil. Keep rubbing device charged. Results improved by daily forced use. Repeat spray and pour-on treatments as needed, but not more than once every 14 days.
(N2) Permethrin 0.05% EC Spray PY, ME	Mix 1 qt. 5.7% EC in 25 gals. water.	Apply 1-2 qts. diluted spray thoroughly per animal as a high pressure spray. Re-treat as needed but no more than once every 14 days.
(N3) Permethrin 0.5% EC Spray PY, ME	Mix 1 qt. 5.7% EC in 1 1/2 gals. water.	Apply 1-2 ozs. diluted spray as a low pressure spray to face and shoulders of animal. Retreat as needed but not more often than every 14 days.
(N4) Permethrin 0.01% EC Backrubber and Facerubber Oil Mixture PY, ME	Mix 1 qt. 5.7% EC in 10 gals. diesel oil.	Keep rubbing device charged with 1 gal. mixture per 20 feet of cable. Cattle should be forced to use rubbing device daily.

DAIRY CATTLE (LACTATING AND NON-LACTATING)  
EXTERNAL PARASITE CONTROL INSECTICIDES (continued)

INSECTICIDE	FORMULATION & MIXING INSTRUCTIONS	APPLICATION INSTRUCTIONS & RESTRICTIONS
(N5) Permethrin 0.001% EC Spray PY, ME	Mix 1 qt. 5.7% EC in 100 gals. water.	Spray entire animal thoroughly. Retreat 14-21 days later if needed. Do not retreat more often than once every 14 days.
(N6) Permethrin 0.25% Dust PY, ME	Ready-to-use.	Apply 4 to 10 lbs. in self-treatment cotton cloth, doubled burlap bags or commercial dust bags. Suspend where animals will treat themselves daily, such as near mineral stations, salt blocks or in milking barn exit. Bags should hang 4 to 6 inches below topline of cattle. Protect bags from weather. Do not hang bags over feed, mineral or water troughs.
(N7) Permethrin 0.25% Dust PY, ME	Ready-to-use.	Apply up to 2 ozs. (5 Tbs.) per animal. For lice a second treatment may be needed 14-21 days later. Retreat as needed but not more often than every 14 days.
O. PYRETHRIN + SYNERGIST (piperonyl butoxide)  (O1) Pyrethrin 0.075% + Synergist 0.75% Oil Solution or EC Spray NPY, ME	Oil Solution is ready-to-use. EC spray, mix according to label instructions.	Apply 1 to 2 fl. ozs. as a fine mist spray daily to all body parts especially head and neck, with hand or automatic sprayer. Do not wet skin.
(O2) Pyrethrin 0.05% + Synergist 0.5% EC Spray NPY, ME	Mix according to label instructions.	Apply 1 to 2 qts. as wet spray every 3 to 7 days if needed.
(O3) Pyrethrin 0.05% to 0.1% + Synergist 0.5% to 1% Oil Solution or EC Spray NPY, ME	Oil Solution ready-to-use. EC Spray, mix according to label instructions.	Apply 1 to 2 fl. ozs. as a light mist spray to dairy cattle with hand or automatic sprayer. Do not wet skin.
(O4) Pyrethrin 0.1% + Synergist 1% EC Spray NPY, ME	Mix according to label instructions.	Apply 1 to 2 qts. as a wet spray every 2 to 3 days or apply 1 to 2 fl. ozs. as a light mist spray daily with hand or automatic sprayer.
(O5) Pyrethrin 0.025% + Synergist 0.25% EC Spray NPY, ME	Mix according to label instructions.	Apply thoroughly as wetting spray. Repeat after 2 to 3 weeks if needed.
P. SPINOSYN (Spinosad) (P1) Elector Insecticide	Pour-on ready-to-use	Pour-on 4 ml per 110 lbs of body weight. Can be used on lactating dairy animals. No milk discard or withholding.
(P2) Elector Insecticide	Dilute 10 oz. in 5 gal. water and apply as spray.	Dilute 10 oz. to 5 gallons water and apply as a spray. Can be used on lactating dairy animals. No milk discard or withholding.
Q. STIROFOS OR TETRACHLORVINPHOS  (Q1) Rabon 3% Dust OP, ME	Ready-to-use.	Apply 2 ozs. of dust per animal. Rub in lightly or apply in suspended self-treatment dust bags. Repeat as needed.
(Q2) Rabon 13.7% PVC ear tag OP, LE		Attach one tag to the inside of each ear when flies reach 50 to 100 per animal in the spring. Remove tag when control drops off. Remove tag before slaughter.
(Q3) Rabon Oral Larvicide Feed Mixture OP, LE	Mix Rabon 7.76% Oral Larvicide Pre-mix in feed or mineral mixes or it is available in ready-to-use products.	Feed the appropriate larvicidal feed or mineral mix to milking cows to prevent the development of fly larvae in manure. Follow manufacturers instructions to ensure adequate amounts are consumed.
R. TETRACHLORVINPHOS + DICHLORVOS (R1) Ravap E.C. Livestock, Poultry & Premise Insecticide Spray	1 gal in 200 gal water for lactating dairy	Can be used on lactating dairy cattle, with no withholding. Dilute according to label instructions.

<b>INSECTICIDE</b>	<b>FORMULATION &amp; MIXING INSTRUCTIONS</b>	<b>APPLICATION INSTRUCTIONS &amp; RESTRICTIONS</b>
(R2) Ravap E.C.	Diluted in oil for backrubber	Used n backrubbers, diluted in approved oil. Recharge biweekly, or when efficacy diminishes.
S. ZETA-CYPERMETHRIN (S1) Python Magnum Insecticide Cattle Ear Tag	Ready-to-use	Apply 1 tag per head to the front or back of one ear on each animal to control most strains of horn flies and to aid in the control of face flies, stable flies, and house flies for up to 4 months.

LE - less effective or effectiveness not established, ME - most effective, OP - organophosphate, CAR - carbamate, PY - pyrethroid, NPY - natural pyrethrum, IGR - insect growth regulator, OCL - organochlorine, ML - macrocyclic lactone.

## CATTLE EAR TAGS

<b>TAG NAME</b>	<b>ACTIVE INGREDIENT</b>	<b>CHEMICAL CLASS</b>	<b>BEEF</b>	<b>LACTATING DAIRY</b>
Atroban Extra	permethrin	Pyrethroid	YES	YES
Command	ethion	Organophosphate	YES	YES
Co-Ral Plus	diazinon + coumaphos	Organophosphate	YES	NO
Cylence Ultra	beta-cyfluthrin	Pyrethroid	YES	YES
Diaphos R	diazinon + chlorpyrifos	Organophosphate	YES	NO
Dominator	pirimiphos methyl	Organophosphate	YES	NO
Double Barrel	lambdacyhalothrin + pirimiphosmethyl	Pyrethroid + Organophosphate	YES	NO
Ectrin	fenvalerate	Pyrethroid	YES	YES
GardStar Plus	permethrin	Pyrethroid	YES	YES
Max-Con	cypermethrin + chlorpyrifos	Pyrethroid + Organophosphate	YES	YES
Optimizer	diazinon	Organophosphate	YES	NO
Patriot	diazinon	Organophosphate	YES	NO
PYthon	zeta-cypermethrin	Pyrethroid	YES	YES
Saber Extra	lambdacyhalothrin	Pyrethroid	YES	NO
Super Deckem	fenvalerate	Pyrethroid	YES	YES
Warrior	diazinon + chlorpyrifos	Organophosphate	YES	NO
X-Terminator	diazinon	Organophosphate	YES	NO
ZetaGard	zeta-cypermethrin	Pyrethroid	YES	YES
Z-Diazinon	diazinon	Organophosphate	YES	NO
Z-Permethrin	permethrin	Pyrethroid	YES	YES

Ear tags are generally effective against horn flies; they aid in control of face flies, stable flies, house flies and ear ticks. Remove tags when control declines, at the end of fly season, or before slaughter.