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Controlling Insects and Mites on Beef and Dairy Cattle

Michigan State University

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Controlling Insects and Mites ON BEEF and DAIRY CATTLE



WARNINGS AND INFORMATION

Pest control in livestock requires year-round management. Livestock are never free of insects and mites.

Pests can lower meat and milk production and make animals more susceptible to disease. Further injury occurs when animals rub against fences, barbed wire, etc., to relieve itching. Improperly used pesticides can injure humans and animals or result in harmful and illegal residues in meat and milk.

Pest control clearly requires that you take the following precautions:

1. Use only the suggested dosages; measure carefully.
2. Do not apply chemicals closer to slaughter than the days given in this bulletin.
3. Read labels before using, and follow all instructions on labels.
4. Provide ventilation while using pesticides.
5. Prevent drift to adjacent cropland, yards, woodlots, lakes or ponds. Some materials may kill fish or wildlife.
6. Avoid treatment when animals are sick (especially in winter), overheated or stressed (shipping, dehorning, castration, recent weaning).
7. Use dust if possible instead of spray on sick or weak animals in winter, or spray on warm day. If sprayed indoors, turn out immediately to dry. Avoid undue exposure of animals to mists and vapors. Do not apply material directly on animals unless directions permit. Read label.

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8. Avoid contamination of feed and water.

9. Do not breathe any form of insecticide. Use face masks.

10. If you spill any form of insecticide on the skin, wash immediately with soap and water.

11. Do not add chemical to old dipping water. Start with fresh water to avoid poisoning animals and excess residues in meat.

12. Keep meat and milk away from contaminating chemical.

13. Do not spread treated manure on vegetable cropland unless specific materials are approved. Read label.

14. Do not contaminate feed, mangers, watering cups, milking equipment, milk, wells, ponds or streams with pesticides.

15. Store pesticides in the original, plainly labeled containers, safely locked away from livestock, pets, and children.

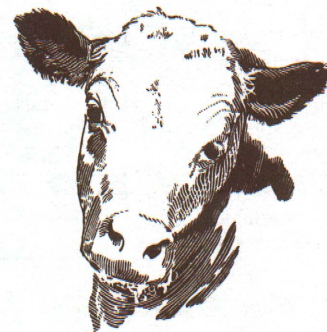
16. Provide ventilation during the use of all materials.

FLY CONTROL IN BARNS AND BARNYARDS

For best results, use a combination of formulations such as baits, residual sprays, larvicides, barn atomizers, etc., during the fly season. Act promptly. Treat as fly populations begin to build-up. Treat regularly.

SANITATION

- Clean out pens as frequently as possible.
- Spread manure thinly outdoors to kill fly eggs and larvae by drying.
- Get rid of silage seepage areas, wet litter, manure stacks, wet hay or straw and other organic matter.



— Provide proper drainage in barnyards.

SPRAYS

Barn surfaces vary in how much spray can be applied to them. Smooth surfaces take less, rough ones more. Follow instructions for each insecticide. NOTE: Use no more gallons of spray than given in the tables to 1,000 square feet.

Add one of the insecticides to water as indicated in Table 1.

BAITS

Apply baits to clean concrete or wherever flies gather. Baits can be used alone, but should be used in conjunction with wall and ceiling sprays.

Use one of the following:

DRY BAITS — 1% ronnel (Korlan) or dichlorvos; or 1% trichlorfon (Dipterex, Dylox, Neguvon); or 3½% malathion; or ½% naled (Dibrom). Follow manufacturers' label directions. Do not use Diazinon in dairy barns or milkrooms.

WET BAITS — (1) Add ½ pint of a malathion 57% EC plus 1 cup of sugar syrup to 2½ gallons of water; or 2 ounces of Diazinon 50% WP plus 1 pound of sugar in 5 gallons of water. Apply with a sprinkling can or other suitable equipment. (2) Use 1/10% trichlorfon (Dipterex, Dylox, Neguvon); or 1/10% dichlorvos; or 2% ronnel (Korlan) liquid bait. Follow label directions carefully. **Do not use Diazinon in dairy barns or milkrooms.**

Warnings — Do not apply where animals can slip and fall. Keep away from children.

Table 1. — INSECTICIDE MATERIALS FOR SPRAY APPLICATION IN BARN.

Chemical	Amount per 1,000 sq. ft.	Comments and Warnings
Dimethoate, 1% in water spray.	1 gal.	Mix 1 gal. of 23.4% EC in 25 gal. of water. Apply thoroughly as a surface spray to interior and exterior surfaces. Remove animals before spraying. Do not contaminate milk or milking equipment.
Fenthion (Baytex), 1.25% in water spray.	2 gals.	Mix 1 quart of 93% LC in 25 gals. of water. Apply thoroughly to walls, ceilings, etc. Do not apply directly to animals. Do not use as a space spray. Do not contaminate milk or milking equipment.
Malathion, 1% in water spray.	1 to 2 gals.	Mix 8 lbs. of 25% WP or 2 quarts of 57% EC in 25 gals. of water. Apply thoroughly to walls, ceilings, etc. Do not contaminate milk or milking equipment.
Ronnel (Korlan), 1% in water spray.	1 gal.	Mix 1 gal. 24% EC in 25 gals. of water. Apply to walls, ceilings, etc. Do not contaminate milk or milking equipment.
Diazinon, ½% in water spray.	1 to 2 gals.	Mix 2 lbs. of 50% WP in 25 gals. of water. Apply thoroughly to walls, ceilings and other areas where flies congregate. Do not use in dairy barns, milkrooms or poultry houses. Do not contaminate food, feed, or water.
Ravap (23% Rabon and 5.3% dichlorvos) 1% in water spray.	1 gal.	Mix 1 gal. Ravap in 25 gals. water. Apply to walls, ceilings, etc. of beef and dairy barns, livestock sheds, calf and hog barns and other farm buildings. Do not contaminate milk or milking equipment.

FLY MAGGOTS IN MANURE

Treat manure piles with one of the following mixed in 25 gallons of water:

Dimethoate — 1 gallon emulsion containing 2 pounds chemical per gallon.

Malathion — 3 pints emulsion containing 5 pounds chemical per gallon or 8 pounds 25% wettable powder.

Rabon — 4 pounds 50% wettable powder.

Ronnel (Korlan) — 1 gallon emulsion containing 2 pounds active ingredient per gallon.

Diazinon — 10 ounces of 50% wettable powder. Wet the surface of the manure. It is not necessary to soak it. Repeat as needed.

Warnings: — Do not apply dimethoate, malathion, ronnel or Rabon to livestock unless the package label or Michigan State University literature gives instructions to do so. Do not apply chemically treated manure to vegetable cropland unless specific materials are approved.

SPRAYS FOR FEED LOTS

Removal of manure from feedlots is a must. For sprays around fences, over manure piles and inside walls of loafing pens, use Rabon or ronnel as given for treating inside walls and ceilings of barns.

Warnings: — Do not spray animals directly with these materials unless other sections of this bulletin give approval. Avoid treating livestock-resting areas. Keep these clean and well bedded.

SPRAY FOR OUTSIDE BARN

Use dimethoate, malathion, ronnel, or Fenthion as given for treating inside walls and ceilings. Follow all label instructions for use outside dairy barns. Do not apply to water and feed crops. Do not use Diazinon in dairy barns or milkrooms.

SPACE OR AEROSAL SPRAYS

Space sprays or aerosols containing 0.1% pyrethrins and 1% piperonyl butoxide (½ fluid ounce per 1,000 cubic feet) give satisfactory knock-down and kill of flies. A 1% dichlorvos (Vapona) or naled (Dibrom) insecticide applied as a fog or mist is effective. One pint of a 1% solution will treat 8,000 cubic feet (40 x 20 x 10). Do not use this fogging solution in areas where animals have received a direct application within the previous 8 hours. Avoid contamination of milk and milk utensils. Daily use of atomizers or foggers is necessary when they are used alone. Read the label for mixing instructions.

FLIES IN MILKROOM

Minute amounts of pesticides can be detected in milk, and are illegal. You must prevent contamination of milk, milk utensils and containers.

The following are suggested for the milkroom, if used according to label instructions and precautions:

dichlorvos (Vapona) 20% farm or pest strip; dichlorvos (Vapona) 0.5% bait; naled (Dibrom) ½% liquid or dry baits; ronnel (Korlan) 1% dry or 2.0% liquid bait; malathion 1.0% bait spray; trichorfon (Neguvon) 1% dry bait; pyrethrin, 0.3% plus piperonyl butoxide 3.0% water spray or 0.6% aerosol formulation.

To keep residues out of milk, avoid on-the-farm use of chlorinated hydrocarbon insecticides, such as endrin, heptachlor, lindane, toxaphene, etc.

Abbreviations in this bulletin:

- WP means Wettable Powder
- EC means Emulsifiable Concentrate, or Emulsion
- LC means Liquid Concentrate
- SC means Suspension Concentrate
- D means Dust
- Tbsp. means tablespoon
- tsp. means teaspoons

Table 2. — INSECT AND MITE CONTROL PROGRAM FOR BEEF CATTLE.

Pest	Material and Formulation	Min. Days from Last Appl. to Slaughter	Amount per Animal or Area, if Appropriate	Comments
CATTLE GRUB Common grubs found in native Michigan cattle from Jan. to March, northern cattle grub or bomb fly from March to June. Both cause lumps on back. Maggots are spiny, legless, curved-bodied. White until mature when they turn brown or black. Pupate in soil; adults emerge in 4 to 5 weeks; complete life cycle in 1 year. Treatment on cattle from outside Michigan usually at different times than native (Michigan) animals. Time treatments as follows: Native cattle — Sept. 15 to Nov. 1; Texas and Southwest — April 1 to July 30; Oklahoma and Kansas — May 1 to Aug. 31; Iowa, Nebraska, Colorado — June 1 to Sept. 30; Dakotas, Wyoming, Montana — July 1 to Oct. 31; Canada — Sept. 1 to Dec. 31. Do not treat after warbles (grubs) appear on backs of animals. In cattle brought from outside Michigan, first warbles usually occur as follows: Michigan—Jan. 1 to June; Canada—April or earlier; Dakotas, Wyoming, Montana—January; Iowa, Nebraska, Colorado—December; Oklahoma and Kansas—November; Texas and Southwest—October. Note — Generally, common cattle grub occurs first and northern cattle grub, or bomb fly, last. In Michigan cattle, do not apply spray, pour-on or dip treatments before Sept. 15 or after Nov. 1. Do not apply a chemical when warbles are in backs of animals because by this time all damage to meat, hide, etc. has been done.	coumaphos (Co-Ral), water spray 0.375 to 0.5%	0	Depends on animal size and hair coat.	Use 12 to 16 lbs., Co-Ral 25 WP per 100 gals. of water. Follow label directions and precautions. Spray thoroughly. Do not apply to lactating dairy animals or to dry dairy animals within 14 days of freshening.
	coumaphos (Co-Ral), Pour-on, 4%	0	½ fl. oz. per 100 lbs. body weight	Pour evenly along back-line. Do not treat lactating dairy animals or dry animals within 14 days of freshening. READ THE LABEL.
	famphur (Warbex), 13.2% pour-on	35	½ oz. per 100 lbs. body weight. Up to a maximum of 4 oz. per animal.	This ready-to-use formulation requires no mixing. Do not repeat treatment. Do not use on Brahman cattle. Do not use on lactating dairy animals or on dry dairy animals within 21 days of freshening.
	Prolate, 11.6% Pour-on	21	1 oz. per 100 lbs. body weight. Up to a maximum of 8 oz. per animal.	Dilute 1 gal. of 11.6% Prolate with 2 gal. water. Follow all label directions. Pour evenly along back line of the animals. Do not apply to dairy animals.
	ronnel 0.26% in feed, (Use in purified grade only)	10	0.3 lb. per 100 lbs. body weight per day.	Feed daily for 14 days. Follow label directions and precautions. Mix with feed (grain or protein supplement). Do not feed to lactating dairy animals or to dry animals within 10 days of freshening.
	ronnel 5.5% block, or granules	10	0.25 lb. per 100 lbs. body weight per month.	Feed free-choice continuously for not less than 75 days. If feeding ronnel, do not spray, dip, or pour-on ronnel coumaphos, Ruelene, or Trichlorfon. Follow label directions and precautions. Do not feed to lactating dairy animals or to dry animals within 10 days of freshening.
	ronnel (Trolene 18) up to 6% in minerals mixed in feed.	10	0.2 lbs ronnel per 100 lbs. body weight per day for 7 days.	Follow label directions and precautions. Mix with feed (grain or protein supplement). See label for 14 day feeding schedule also 75 day free choice schedule.
	Ruelene 25E pour-on.	7	1 fl. oz. per 100 lbs. body weight up to 800 lbs. Use no more than 8 fl. oz. per animal.	Dilute ½ gal. of 25% Ruelene emulsifiable concentrate with 1½ gals. of water. Follow label directions and precautions. Pour evenly along the back line with a marked dipper. Do not apply to lactating dairy cattle or to dry animals within 3 days of freshening.
	Ruelene 12R pour-on.	7	½ fl. oz. per 100 lbs. body weight up to 1000 lbs. Use no more than 5 fl. oz. per animal.	This ready-to-use Ruelene requires no mixing. Do not treat more often than once every 28 days. Pour evenly along the back line with a marked dipper. Do not apply to lactating dairy animals or to dry animals within 3 days of freshening.
	trichlorfon (Neguvon), pour-on 8%.	21	½ fl. oz. per 100 lbs. body weight. Use no more than 4 fl. oz. per animal.	Follow label directions and precautions. Pour evenly along the back line with a marked dipper. Do not apply to lactating animals or to dry animals within 7 days of freshening.
	Fenthion (Spotton) Ready-to-use 20% solution.	45	4 cc per 150 to 300 lbs. body weight.	Apply the proper amount of solution to a single location on the midline of the animal's back. A single application is adequate. Do not treat dairy cattle of breeding age. READ THE LABEL.
	fenthion (Tiguvon), pour-on 3%.	35	½ fl. oz. per 100 lbs. body weight.	Ready-to-use. Pour evenly along back line. Do not treat lactating dairy animals or dry animals within 28 days of freshening. READ THE LABEL.
	FACE FLY Face Flies — resembles house flies, but darker, larger. Females have a grayish-green abdomen; hard to tell from house flies. Male abdomen has black line down center; eyes almost touch. Males not found on animals. Female feeds around eyes, lips, in and around nostrils, and may aid spread of eye diseases. Larvae feed in fresh cow dung.	Ciovap EC (10% Ciodrin and 2.5% dichlorvos), 1% in water spray.	0	1 to 2 pints for adult animals — proportionately less on smaller animals.
Rabon, 3% dust. (Use as bought.)		0	2 oz. per animal.	Apply dust along back, neck, poll and to the face. Rub into hair lightly. Repeat as necessary. READ THE LABEL.
or 3% dust bag.		0	Sufficient to provide adequate coverage.	Place bags near salt or mineral blocks, or in door exits, alley ways, etc. so they will be used daily. READ THE LABEL.
coumaphos (Co-Ral), 1% in oil.		0	1 gal. of solution per 20 ft. cable.	Use in a backrubber. Saturate backrubber. Mix 4 quarts of 11.6% EC Co-Ral in 13 gals. of No. 2 furnace oil or No. 2 diesel oil.

Table 2. — Beef Cattle — continued

Pest	Material and Formulation	Min. Days from Last Appl. to Slaughter	Amount per Animal or Area, if Appropriate	Comments
<p>HORN FLY Horn Fly — grayish-black, half the size of house fly; sucking mouth parts. Feed primarily on withers, around horns, along back. In hot weather or rain, may move to belly; on cool nights may cluster between hind legs. Eggs laid in fresh manure; hatch in about 20 hours; maggots grow for about 5 days before pupating; 5-days later adults emerge.</p> <p>Note: Back rubbers used with year-round control will help control horn flies, possibly other pests. Place back rubbers so as to force animals to use them — near feed supplements, water or along fenced run where animals must pass.</p>	Ciovap EC (10% Ciodrin and 2.5% dichlorvos), 1% in water spray.	0	1 to 2 pints.	Mix 2 quarts of Ciovap EC (1.1 lbs. per gal.) per 6 gals of water. Do not apply more often than once every 7 days. Spray thoroughly, especially on back and upper portion of sides.
	Ciodrin, 3% dust. (Use as bought.)	0	2 Tbsps.	Sprinkle on poll, back and sides. Do not apply dust more often than once every 14 days. Do not treat calves under 6 months of age. Do not treat Brahman cattle.
	Rabon, 3% dust. (Use as bought.)	0	2 oz. per animal.	Apply dust along back, neck, poll and to the face. Rub into hair lightly. Repeat as necessary. READ THE LABEL.
	or 3% dust bag.	0	Sufficient to provide adequate coverage.	Place bags near salt or mineral blocks, or in door exits, alley ways, etc. so they will be used daily. READ THE LABEL.
	coumaphos (Co-Ral), 1% dust bag.	0	1 10-lb. dust bag per 10 to 20 animals.	Place in lanes or gateways such that animals use them daily. Do not contaminate food, feed, or water. READ THE LABEL.
	or 1% shaker can.	0	2 oz. per animal.	Dust evenly into hair of head, neck, shoulders, back and tailhead. READ THE LABEL.
	coumaphos (Co-Ral), 1% in oil.	0	1 gal. of solution per 20 ft. cable.	Use in a backrubber. Mix 4 quarts of 11.6% Co-Ral EC in 13 gals. of No. 2 furnace or No. 2 diesel oil. Saturate backrubber.
	coumaphos (Co-Ral), 0.06% in water spray.	0	1 or 2 quarts.	Mix 2 lbs. of Co-Ral 25% WP in 100 gals. of water; apply as needed. Do not spray animals less than 3 months old. Do not apply to lactating dairy animals, or to dry animals within 14 days of freshening. Spray on back.
	malathion, ½% in water spray.	0	2 quarts.	Mix 1½ gal. of malathion 57% EC or 16 lbs. of malathion 25%WP per 100 gallons of water. Apply every 2 weeks if needed. Spray on back and neck.
	malathion, 4 or 5% dust bag.	0	Sufficient to provide adequate coverage.	Place such that the animals use them daily. Do not treat lactating dairy animals or dry animals within 14 days of freshening. READ THE LABEL.
	methoxychlor, ½% in water spray.	0	2 quarts.	Mix 1 quart of methoxychlor 24% EC to 12½ gals. of water. Apply every 3 weeks, or as needed. Spray back.
	Prolate, ¼% in water spray.	21	Use about 1 gal. per animal.	Mix 1 gal. of 11.6% Prolate in 49 gals. water. Spray entire animal but especially along the back. Do not apply to dairy animals. READ THE LABEL.
	ronnel (Korlan), 1% in oil.	0	1 gal. solution per 20 ft. cable.	Use in a backrubber. Mix 1 gal. of Korlan 24% EC with 27 gals. of diesel, or similar oil. (Do not use motor oil). May also be used on lactating dairy animals. Saturate backrubber.
	ronnel (Trolene 18), 6% Insecticide mineral mix.	10	0.2 lbs. per 100 lbs. body weight per head per month.	Begin feeding in spring before hornflies appear and continue until cold weather restricts their development. Do not use on lactating dairy animals.
ronnel (Korlan), 0.5% in water spray.	7	Spray entire animal to wet hair coat thoroughly.	Mix 2 quarts of Korlan 4E in 50 gals. of water. Repeat as necessary but not more than every two weeks. Do not treat lactating animals. READ LABEL.	
Ruelene (All formulations)	7	Same applications and rates as for grubs.		
toxaphene, 5% in oil.	28	1 gal. solution per 20 ft. cable.	Use in a backrubber. Ready-to-use dilute solution. Do not use on animals less than 3 months old. Saturate backrubber.	
toxaphene, ½% in water spray.	28	2 quarts.	Mix 1 gal. of toxaphene 59% EC (6 lbs. per gal.) in 150 gals. or 5 pints 59% EC in 100 gals. of water. Apply every 3 weeks or as needed. Spray back.	
<p>STABLE FLY Stable Fly — ¼ in. long, grayish, seven rounded dark spots on top of abdomen; piercing and sucking beak. Lays eggs in manure, decaying vegetation. When not on cattle, rests in shade on wooden posts, trees, buildings. Prefers active animals, ears and legs.</p>	dichlorvos (Vapona), 1% in water spray.	0	2 fl. oz. applied as mist sprays to cover animal — especially legs and lower body.	Mix 1 quart of 23.4% Vapona EC with six gals. of water. Apply thoroughly but do not wet the skin. Do not exceed 2 fl. oz. per animal per day. READ THE LABEL.
	Synergized Pyrethrins. (0.1% pyrethrins + 1% synergist)	0	1 to 2 fl. oz.	Mist spray.

Table 2. — Beef Cattle — continued

Pest	Material and Formulation	Min. Days from Last Appl. to Slaughter	Amount per Animal or Area, if Appropriate	Comments
HORSE FLY, DEER FLY Horse and Deer Fly — 1/4 to 1 in. long; usually brown with brilliantly colored eyes. Smaller kinds have brown-banded wings. Females feed on blood. Maggots live in mud at bottom of shallow lakes, ponds and swamps.	Synergized Pyrethrins. (0.1% pyrethrins + 1% synergist)	0	1 fl. oz.	Apply as a mist spray to all parts of the body, especially the back. Use according to label.
	Pyrethrins, 0.75% dust.	0	1 Tbsp.	Dust thoroughly. Repeat after 2 or 3 weeks. Sprinkle on poll, back and sides or use dust bags.
LICE Red chewing louse — 1/12 in. long when mature; colorless eggs, later turn very light brown. Short-nosed cattle louse — 1/8 in. long, slate-gray, wingless, short pointed head. Sucks blood. White eggs attach to hair. Long-nosed cattle louse — 1/10 in. long, blue, wingless, long pointed head. Black eggs. Most bothersome in winter, so late fall treatment (before cold weather) checks numbers and delays damage. Two thorough treatments (14 days apart) normally eliminate lice, if newly purchased animals are isolated and treated before being turned in with herds. Treatment times for cattle grubs and lice are not necessarily compatible. Cattle grub systemic treatments for native Michigan cattle must be applied no later than Nov. 1. Best time for cattle lice would be after Nov. Lice treatment in Dec. is usually better than Sept., Oct. or even Nov.	coumaphos (Co-Ral) 1% in oil; or ronnel (Korlan) 1% in oil; or toxaphene 5% in oil.		Same as for Horn Fly.	Use a backrubber.
	Ciodrin, 3% dust. (Use as bought.)	0	2 Tbsp.	Do not apply dust more than once every 3 weeks. Do not treat calves under 6 months of age. Sprinkle on poll, back and sides. Do not treat Brahman cattle.
	coumaphos (Co-Ral), 0.06% in water spray.	0	Depends on animal size and hair coat.	Mix 2 lbs. of Co-Ral 25% WP, or 4 quarts of 11.6% Co-Ral EC in 100 gals of water. Do not treat animals less than 3 months old. Spray animals 3 to 6 months old lightly. Spray thoroughly.
	coumaphos (Co-Ral), 1% dust bag.	0	1 10-lb. dust bag per 10 to 20 animals.	Place in lanes or gateways such that animals use them daily. Do not contaminate food, feed, or water. READ THE LABEL.
	or 1% shaker can.	0	2 oz. per animal.	Dust evenly into the hair of the head, neck, shoulders, back and tailhead. READ THE LABEL.
	malathion, 1/2% in water spray.	0	Depends on animal size and hair coat.	Mix 1 gal. of malathion 57% EC, or 16 lbs. malathion 25% WP, or 8 lbs. malathion 50% WP per 100 gals. of water. Do not use on calves less than one month old. Do not treat lactating dairy animals or dry animals within 14 days of freshening. Spray thoroughly.
	trichlorfon (Neguvon), pour-on 8%	21	1/2 fl. oz. per 100 lbs. body weight. Use no more than 4 fl. oz. per animal.	Follow label directions and precautions. Pour evenly along the back-line with a marked dipper. Do not apply to lactating animals or to dry animals within 7 days of freshening.
	malathion, 4 or 5% dust bag.	0	Sufficient to provide adequate coverage.	Place such that the animals use them daily. Do not treat lactating dairy animals or dry animals within 14 days of freshening.
	methoxychlor, 1/2% in water spray.	0	Depends on animal size and hair coat.	Mix 2 gals. of 24% EC or 8 lbs. of 50% WP methoxychlor in 100 gals. of water. Repeat treatment in 2 or 3 weeks, if needed. Spray thoroughly.
	Rabon, 3% dust. (Use as bought.) or 3% dust bag.	0 0	2 oz. per animal. Sufficient to provide adequate coverage.	Apply dust along back, neck, poll and the face. Rub into hair lightly. Repeat as necessary. READ THE LABEL. Place bags near salt or mineral blocks, or in door exits, alley ways, etc. so they will be used daily. READ THE LABEL.
ronnel (Korlan), 1/4% in water spray.	0	Depends on animal size and hair coat.	Mix ronnel (Korlan 24 E), 1 gal. per 100 gals of water. Do not reapply sprays within 2 weeks. Do not use on dairy animals within 7 days of freshening. Spray thoroughly.	
toxaphene, 1/2% in water spray.	28	Depends on animal size and hair coat.	Mix 1 gal. of toxaphene 59% EC (6 lbs. per gal.) in 150 gals. or 5 pints 59% EC in 100 gals of water. Repeat treatment 2 to 3 weeks, if needed. Do not spray dairy animals or calves less than 3 months old. Spray thoroughly.	
Fenthion (Spotton) Ready-to-use 20% solution.	45	4 cc per 150 to 300 lbs. body weight.	Apply proper amount of solution to a single location on midline of the animal's back. A second application may be made but no sooner than 35 days after the first application. Do not treat dairy animals of breeding age. READ THE LABEL.	

Table 2. — Beef Cattle — continued

Pest	Material and Formulation	Min. Days from Last Appl. to Slaughter	Amount per Animal or Area, if Appropriate	Comments
LICE (continued)	Fenthion (Tiguvon) 3% pour-on	35	½ fl. oz. per 100 lbs. body weight.	Ready-to-use. Pour evenly along backline. A second application may be made but not sooner than 35 days after the first application. Do not treat lactating dairy animals within 28 days of freshening. READ THE LABEL.
	Ruelene (All formulations).	7	Same as for cattle grubs.	Same as for cattle grubs.
	famphur (Warbex) pour-on 13.2%.	35	Same as for cattle grubs.	Same as for cattle grubs.
	ronnel (Korlan 2) Pour-on Insecticide for lice, 25.5%.	0	1 oz. per 100 lbs.; 8 oz. adequate for animals over 800 lbs.	Dilute 1 gal. with 4 gals. water. Add water gradually as you mix until mixture thickens. (Special Pour-on formulation). Do not apply to lactating dairy animals or to dry animals within 7 days of freshening.

Table 3. — INSECT AND MITE CONTROL PROGRAM FOR DAIRY CATTLE.

CATTLE GRUB (Non-lactating animals)	coumaphos (Co-Ral), famphur (Warbex), ronnel (Korlan), Ruelene, trichlorfon (Neguvon), fenthion (Spoton and Tiguvon).	READ THE LABEL	SAME AS FOR BEEF CATTLE (Page 3)	Use extreme care when applying these chemicals to NON-LACTATING dairy animals. RECORD THE DATE OF APPLICATION to each animal. If freshening occurs before the minimum number of days shown on the label, DO NOT USE the milk for the balance of the days. CAREFULLY READ AND FOLLOW ALL LABEL DIRECTIONS.
CATTLE GRUB (Lactating animals)	In the past, rotenone has been registered for grub control on lactating dairy cattle; however, at the present time, neither this, nor any other chemical, is registered for this purpose.			
FACE FLY	Ciovap EC (10% Ciodrin and 2.5% dichlorvos), 1% in water spray.	0	5 to 10 tsps.	Mix 4 Tbsps. of Ciovap EC (1.1 lbs. per gal.) in 1½ pints of water and apply 5 tsps. to the face and a total of 5 to 10 tsps. to the back and sides of the animals. Do not apply more often than 3 times per week. READ THE LABEL.
	coumaphos (Co-Ral), 1% in oil.	0	1 gal of solution per 20 ft. cable.	Mix 4 quarts Co-Ral 11.6% EC in 13 gals. of No. 2 furnace (fuel) oil or No. 2 diesel fuel oil. Place backrubbers where animals travel regularly. Do not allow animals to straddle backrubber. READ THE LABEL.
	dichlorvos (Vapona), 1% in water spray.	0	1 to 2 fl. oz.	Dilute 1 quart of Vapona 21.8% EC (2 lbs. per gal.) with 6 gals. of water. Do not apply in excess of 2 fl. oz. per animal per day. Apply daily with hand or automatic sprayer. Do not wet the skin. Apply as a mist especially to forehead. READ THE LABEL.
	Rabon, 3% dust (Use as bought.) or 3% dust bag.	0	2 oz. per animal.	Apply dust along back, neck, poll and to the face. Rub into hair lightly. Repeat as necessary. READ THE LABEL.
HORN FLY		0	Sufficient to provide adequate coverage.	Place bags near salt or mineral blocks, or in door exits, alleyways, etc. so they will be used daily. READ THE LABEL.
	Ciodrin 3% dust (Use as bought.)	0	1 to 2 Tbsps.	Do not apply more often than once every 14 days. Do not treat calves under 6 months of age. Sprinkle on poll, back, sides. Do not apply to Brahman cattle. READ THE LABEL.
	coumaphos (Co-Ral), 1% in oil.	0	1 gal. of solution per 20 ft. cable.	Mix 4 quarts Co-Ral 11.6% EC in 13 gals. of No. 2 furnace (fuel) oil or No. 2 diesel fuel oil. Place backrubbers where animals travel regularly. Do not allow animals to straddle backrubber. READ THE LABEL.
	Rabon, 3% dust (Use as bought.) or 3% dust bag.	0	2 oz. per animal.	Apply dust along back, neck, poll, and to the face. Rub into hair lightly. Repeat as necessary. READ THE LABEL.
			Sufficient to provide adequate coverage.	Place bags near salt or mineral blocks, or in door exits, alleyways, etc. so they will be used daily. READ THE LABEL.

Table 3. — Dairy Cattle — continued

Pest	Material and Formulation	Min. Days from Last Appl. to Slaughter	Amount per Animal or Area, if Appropriate	Comments
HORN FLY (continued)	coumaphos (Co-Ral), 1% dust bags.	0	1 10-lb. dust bag per 10 to 20 animals.	Suspend dust bags in exit through which cows leave milking barn.
	or 1% shaker can.	0	2 oz. per animal.	Dust evenly into the hair of the head, neck, shoulders, back and tailhead. READ THE LABEL.
	Korlan 1% in oil	0	1 gal. of solution per 20 ft. cable.	Backrubber application. Can be used anytime on lactating cows.
	malathion, 5% dust. (Use as bought.)	0	3 Tbsps. per animal.	Apply dust at least 5 hours before milking. Never apply during milking. Do not repeat application more often than once every 2 weeks. Sprinkle on back and neck. READ THE LABEL.
	methoxychlor, 50% WP. (Use as bought.)	0	1 Tbsp. per animal.	Apply dry powder (do not mix in water) to back and neck of each animal. Rub powder into hair with the hand. Repeat every 3 weeks if necessary.
	pyrethrins, 0.1% in oil or EC, with 1% synergist.	0	1 fl. oz.	Apply as a mist spray. Use daily in hand sprayers, microsols, foggers, automatic sprayers, or backrubbers. Synergists such as piperonyl butoxide are recommended. Follow label directions.
	pyrethrins, 0.75% dust.	0	1 Tbsp.	Dust thoroughly. Repeat after 2 or 3 weeks. Sprinkle on poll, back, sides or use dust bags.
STABLE FLY	pyrethrins, 0.1% in oil or EC, with 1% synergist.	0	Same as for Horse Fly in Dairy Section.	Apply as a mist spray.
	pyrethrins, 0.75% dust.	0	1 Tbsp.	Dust thoroughly. Repeat after 2 to 3 weeks. Sprinkle on poll, back and sides or use dust bags.
HORSE FLY, DEER FLY	pyrethrins, 0.1% in oil or EC, with 1% synergist.	0	1 to 2 fl. oz.	Apply daily with hand or automatic sprayer. Use same synergist as for horn fly. Follow label instructions. Apply as a mist — especially to the back.
	pyrethrins, 0.75% dust.	0	1 Tbsp.	Dust thoroughly. Repeat after 2 to 3 weeks. Sprinkle on poll, back and sides or use dust bags.
LICE	Ciovap EC (10% Ciodrin and 2.5% dichlorvos), 1% in water spray.	0	Depends on animal size and hair coat.	Spray thoroughly. A second application may be required in 14 days. Do not spray more often than once every 7 days. READ THE LABEL.
	Ciodrin, 3% dust. (Use as bought.)	0	2 Tbsp.	If required, repeat thorough application in 3 to 4 weeks. Do not treat calves under 6 months of age. Treat thoroughly. Do not apply to Brahman cattle. READ THE LABEL.
	coumaphos (Co-Ral), 0.3% in water spray.	0	Depends on animal size and hair coat.	Mix 1 lb. Co-Ral 25% WP or 1 quart 11.6% EC in 100 gals. of water. Repeat sprays as necessary.
	or 1% dust bags.	0	1 10-lb. bag/exit	Suspend dust bags in exit through which cows leave milking barn.
	or 1% shaker can.	0	2 oz. per animal.	Dust evenly into hair of head, neck, shoulders, back, and tailhead.
	Rabon, 3% dust. (Use as bought.)	0	2 oz. per animal.	Apply dust along back, neck, poll and to the face. Rub into hair lightly. Repeat as necessary. READ THE LABEL.
	or 3% dust bag.	0	Sufficient to provide adequate coverage.	Place bags near salt or mineral blocks, or in door exits, alleyways, etc. so they will be used daily. READ THE LABEL.
	famphur (Warbex) pour-on 13.5%.	35	Same as for cattle grubs.	DO NOT USE on LACTATING DAIRY ANIMALS or on dry animals within 21 days of freshening.

POISON INFORMATION CENTER

DETROIT

Detroit City Health Department
1151 Taylor Avenue 48202
(313) TR2-1540

POISON TREATMENT CENTERS (Information and Treatment)

ADRIAN

Emma L. Bixby Hospital
818 Riverside Ave. 49221
(313) 263-2412

FLINT

Hurley Hospital
6th Ave. & Begole 48502
(313) 232-1161 ext. 220

LANSING

St. Lawrence Hospital
1210 W. Saginaw Street 48914
(517) 372-3610 ext. 305

ANN ARBOR

University Hospital
1405 E. Ann Street 48104
(313) 764-5102

GRAND RAPIDS

Blodgett Memorial Hospital
1840 Wealthy, S.E. 49506
(616) 774-7740

MARQUETTE

Marquette General Hospital
425 W. Fisher Street 49855
(906) 228-9440 ext. 416

BATTLE CREEK

Community Hospital
200 Tomkins St. 49016
(616) 963-5521

Butterworth Hospital
100 Michigan, N.E. 49503
(616) 774-1774

MIDLAND

Midland Hospital
4005 Orchard Drive 48640
(517) 835-6771 ext. 308 or 328

BAY CITY

Bay Medical Center
100 15th Street 48706
(517) 893-5511

Grand Rapids Osteopathic Hospital
1919 Boston St., S.E.
(616) 452-5151

MONROE

Mercy-Memorial Hospital Corp.
700 Stewart Road 48161
(313) 241-6509

BERRIEN CENTER

Berrien General Hospital
Dean's Hill Road 49102
(616) 471-7761

HANCOCK

St. Joseph's Hospital
200 Michigan Avenue 49930
(906) 482-1122

PETOSKEY

Little Traverse Hospital
416 Connable 49770
(616) 347-7373 ext. 251

COLDWATER

Community Health Center
of Branch County
274 E. Chicago Street 49036
(517) 278-7361

HOLLAND

Holland City Hospital
602 Michigan Avenue 49423
(616) 396-4661

PONTIAC

St. Joseph Mercy Hospital
900 Woodward Avenue 48053
(313) 858-3000

DETROIT

Children's Hospital of Michigan
3901 Beaubien 48201
(313) 494-5711

JACKSON

W. A. Foote Memorial Hospital
205 N. East Street 49201
(517) 783-2771

PORT HURON

Port Huron Hospital
1001 Kearney St. 48060
(313) 982-8511

Mount Carmel Mercy Hospital
6071 W. Outer Drive
(313) 864-5400 ext. 417 or 864-5536

KALAMAZOO

Borgess Hospital
1521 Gull Road 49001
(616) 383-4815

SAGINAW

Saginaw General Hospital
1447 N. Harrison Road 48602
(517) 753-3411

ELOISE

Wayne County General Hospital
30712 Michigan Avenue 48132
(313) 722-3748 8 a.m.-11 p.m.
274-3000 11 p.m.-8 a.m.

Bronson Methodist Hospital
252 E. Lovell Street 49006
(616) 383-6338 — 383-6386

TRAVERSE CITY

Munson Medical Center
Sixth Street 49684
(616) 947-6140 ext. 280