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Controlling Insects and Mites of Dairy Cattle Including Treatments for Dairy Barns and Milk Houses

Michigan State University Extension Service

Ray L. Janes, Arthur Wells

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Controlling  
**MITES and INSECTS**  
**of DAIRY CATTLE**

*Including Treatments for*  
**Dairy Barns and Milk Houses**

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COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY

*By Ray L. Janes and Arthur Wells*

**DO NOT USE CHLORINATED HYDROCARBON INSECTICIDES . . .**

This Bulletin does not contain suggestions for use of chlorinated hydrocarbon insecticides on or around dairy cattle. Small amounts (residues) of these materials will concentrate in fat tissue, including the cream of milk. **REMEMBER, CONTAMINATION BY ANY PESTICIDE RESIDUE MAY . . .**

- **RESULT IN THE LOSS OF YOUR MILK MARKET**
- **PROHIBIT SALE OF ANIMALS**

Among the chlorinated hydrocarbon insecticides are: Aldrin, BHC, chlorbenside, chlor-dane, Chlorobenzilate, DDD (TDE), DDT, dieldrin, endosulfan (Thiodan), heptachlor, lindane, methoxychlor, ovex, Sesone, Sulphenone, and toxaphene.

**USE ONLY THE NON-CHLORINATED HYDROCARBON INSECTICIDES AS GIVEN IN THIS BULLETIN.**

ALL INSECTICIDES AND MITICIDES are poisonous in varying degrees. Handle them cautiously so that they will not poison livestock, children, or the user. When using insecticides on livestock, do not increase the dosage. Measure all materials carefully.

Apply chemicals to dairy cattle no closer to slaughter or milking than the time given in this folder. Meat and milk can be seized if they contain more insecticide or miticide than allowed. Read the package label for additional instructions on how to safely use pesticide chemicals on dairy cattle.

There is some danger to dairy cattle when spraying them in the winter. Instead, use a dust. However, if you must spray in the winter, treat on a warm day and turn cattle out of the barn to dry right after spraying. You are taking a risk if you spray during cold weather.

Different spray pressures are needed for control of some insects and mites affecting cattle. For example, sprays for lice, grubs, mange, etc., must be applied at higher pressures on animals with a thick, hair coat. Heavy coats of hair (like some cattle have in winter) are harder to penetrate than light ones. Pressures of 100 to 250 pounds are high enough to control most insects and mites of cattle.

**NOTE:** When low spray pressures of less than 100 pounds are used, a small amount of wetting agent will improve penetration of a heavy coat of hair (see instructions on label for amount). However, do not add too much wetting agent because it will cause too much run-off, reducing the effectiveness of the spray.

## CONTROL RECOMMENDATIONS

### Cattle Grubs

These maggots occur in backs of cattle from January to June, depending on the species. The common cattle grub occurs first, from January to March; then the northern bomb fly, from March to June. Both cause lumps to form along the animal's back. The maggots are spiny, legless, and curved-bodied. Until they are mature, cattle grub maggots are white; at maturity they turn brown or black and escape from the backs of the animals. They pupate in the ground and the adults emerge from there.

## WARNINGS:

Do not allow insecticides, fungicides, and nematocides to drift onto pastures, hayfields, food crops, wood lots, non-crop areas, lakes, or ponds *unless there is no danger involved*. Certain restrictions placed on chemicals when used on animal or human food crops are listed in this bulletin. When applied to water or wildlife areas, some of the materials listed may kill fish or wildlife.

To determine the dangers of drift, read the label on the package. Follow the same restrictions for insecticide and miticide drift as for direct application of the same materials to food crops. For dangers of fish and wildlife poisoning from insecticides, fungicides, and nematocides applied to water or areas other than crop lands, get information from your county agricultural agent.

### Control

For a spray, use rotenone, 7½ pounds of 5% wettable powder or 9½ pounds of 4% wettable powder—to 100 gallons of water. Depending on the size of the animals and the thickness of the hair coat, apply 1 to 4 quarts of the mixture to their backs. Use power sprayers at 100 or more pounds pressure.

For a wash, use rotenone, 12 ounces of 5% wettable powder or one pound of 4% wettable powder to one gallon of water. Apply one pint per animal to shoulders and back. Scrub the back thoroughly as the wash is applied. A sponge or brush may also be used to apply the treatment. Wear rubber gloves when using these methods of application.

In winter use 1½% dust or salve if there is danger to the animals from a spray or wash. Rub the dust through the hair to the skin of the back; apply the salve to the warble openings.

**NOTE:** Rotenone is effective only when it penetrates through the warble opening to the grub. Apply either of the treatments 30 days apart for 2 or more times, depending on the species of grub and the need.

**WARNINGS:** Except for dosage rates, rotenone is not restricted for use on dairy animals, but be sure that you do not contaminate milk, milking equipment, and feed.

## Cattle lice

Three important lice attack cattle. One is the red chewing louse; when mature, it is 1/12 inch long. The short-nosed cattle louse is 1/8 inch long, slate-gray, wingless, and has a short pointed head. It has sucking mouth parts and feeds by sucking blood. The eggs are white and glued to the hair. The long-nosed cattle louse is 1/10 inch long, blue, wingless, and has a long pointed head. Its eggs are black.

### Control

Lice bother most in the winter. Hence, sprays applied in late fall before cold weather hold their numbers in check and delay damage to animals until later in the winter.

If needed, spray the animals once a week (*no oftener*) with Ciodrin. To make the spray, use 1 gallon of a Ciodrin emulsion containing 2 pounds of actual chemical per gallon to 100 gallons of water. Do not apply more than 1 gallon of the mixture to large animals, less to smaller ones.

For smaller amounts, use 3 tablespoons per gallon of water. Apply treatment thoroughly. It is especially important to treat 14 days after the first application for newly hatched lice.

For a second insecticide, dilute pyrethrum emulsion containing 1% pyrethrins and 10% piperonyl butoxide, one part to 39 parts of water. Apply 1 to 2 quarts per animal and repeat in 14 days. Spray the entire animal thoroughly, especially infested areas.

**NOTE:** In winter, use 0.1 to 0.15% pyrethrins plus 1 to 1.5% piperonyl butoxide dust, if there is danger to the animals from a spray or wash.

Rotenone sprays and dusts may also be used. For a spray, apply 2 pounds of 5% wettable powder or 2½ pounds of 4% powder to 100 gallons of water. For a dust, use a ½, ¼, or 1% rotenone. Spray or dust thoroughly. Repeat in 14 days, if needed. Note limitation on spraying.

**WARNINGS:** Except for dosage rates, pyrethrum and rotenone are not restricted for use on dairy animals, but be sure that you do not contaminate milk, milking equipment, and feed. Apply Ciodrin only every 7 days if needed; it should not be used longer than is consistent with good control. Do not contaminate milk, milking equipment, and feed with it.

## Horn, horse, deer, and stable flies and mosquitoes

The horn fly is grayish-black and about one half the size of the house fly. It has sucking mouth parts and remains constantly on dairy cattle. Mosquitoes are so well-known that a description seems unnecessary.

Horse and deer flies range from about ½ to ¾ inch long. They are usually black or brown; many of them have brilliantly colored eyes. The smaller kinds can have brown-banded wings. The females cut the skin with knife-like mouth parts and suck blood from animals.

The adult stable fly can be told by the slender, stiff beak that projects forward from the lower surface of the head and by the 7 spots on the broad, gray abdomen.

### Control

For sprays applied with power or compressed air sprayer equipment, use Ciodrin as given for face fly, or dilute a pyrethrum emulsifiable concentrate containing 1% pyrethrins and 10% piperonyl butoxide, 1 part to 10 parts of water. For each animal, apply 1 to 2 quarts every 3 to 7 days or as needed. For horn flies only, dilute the pyrethrum 1 part to 19 parts of water.

Treadle and other types of self-treater machines are also suitable for treating dairy animals for horn, horse, deer, and stable flies. Some of these can be operated by cattle as they pass through the machine. Use one of the following and do not dilute with water:

- a pyrethrum oil solution (distillate) containing 2/10 of 1% pyrethrins plus 2% piperonyl butoxide.
- Dichlorvos (DDVP or Vapona), 1% mist oil spray.
- Ciodrin, 2% mist oil spray.

Of any material, apply 1 to 2 fluid ounces per animal to the back and underline area primarily. Apply once daily (no more)—preferably in the morning. Do not wet the hair or skin.

Some animals may over-treat themselves with self treating machines. Limit these animals to one treatment a day.

**NOTE:** The type of pyrethrum, dichlorvos, or Ciodrin used in treadle and other treater-type machines

can also be applied with hand sprayers (compressed air type). Apply only 1 to 2 fluid ounces as a mist to the back and underline primarily. Do not wet the hair or skin.

**Back Rubber:** Saturate a back rubber with 1% Ciodrin. Place the back rubber so that it does not compete with shade, especially in pastures.

Other materials for flies affecting dairy animals are:

(1) Lethane 384, 3% in mineral oil solution, or Thanite, 5% in mineral oil solution. Do not dilute. Use 1 to 2 fluid ounces per adult cow, less for smaller animals. Apply in a mist to the outer hair. Do not wet the hair. Do not apply the materials more than once daily and less often for Thanite, if possible.

(2) Butoxy polypropylene glycol (Crag Fly Repellent) and MGK Fly Repellents can also be used for horse, deer, and stable flies. Because Tabatrex, butoxy polypropylene glycol, and MGK Fly Repellents are new materials for stable, horse and deer fly control, we cannot give unqualified suggestions for their use. Therefore, carefully follow the directions (and limitations) on the container for best results with these materials. The materials given in this paragraph are not suggested for application by treadle or self-treater machines.

**WARNINGS:** Except for water and oil mist treatments, allow 7-day intervals between treatments with Ciodrin. Except for dosage rates, pyrethrum plus piperonyl butoxide, Lethane 384, and Thanite are not restricted for use on dairy animals, but do not contaminate milk, milking equipment, and feed. However, note suggestions for use under the control section.

**Special treatment for horn fly only:** Sprinkle 2 ounces (4 level tablespoons) of 4% malathion dust or 1½ ounces (3 level tablespoons) of 5% dust to the back and neck of each animal. Allow 10 days between treatments and apply no closer to milking than 5 hours. Do not use any other malathion dust or spray on dairy animals.

#### Face flies

These species resemble the house fly but are generally a little larger. The females have a grayish-green abdomen and are hard to tell from house flies. Males have orange-yellow abdomens with a black

line down the center and eyes that almost touch. The males feed in summer on nectar and pollen and are not found on the animals. Female face flies feed on animal secretions from the eyes, the lips, and in and around the nostrils—hence their name. Larvae feed on fresh cow dung, and possibly in other kinds of excrement.

#### Control

Face fly control is hard. Hence, careful and timely use of insecticides is required for its control. These insecticides are divided into three different types of application methods. Use only one formulation at a time as follows:

1. **Baits:** Dichlorvos (DDVP or Vapona), ¾ corn syrup salve, 3/5 of a tablespoon per treatment. Apply a 6-inch strip, 1 inch wide on the animal's forehead. Use this every morning for 14 days, then as needed.
2. **Mist oil sprays:** Use only one of the following:
  - Dichlorvos (DDVP or Vapona), 1%.
  - Ciodrin, 2%.
  - Pyrethrum oil solution (distilled) containing 2/10 of 1% pyrethrins plus 2% piperonyl butoxide.

Do not dilute any of these materials. Apply 1 to 2 fluid ounces per animal of one of them, primarily to head, neck, shoulders, and legs. Do not wet the hair or skin. Sprayers or treadle machines can be used to apply the treatment.

3. **Mist water sprays:** Use only one of the following:
  - Dichlorvos (DDVP or Vapona). Mix ½ pint of an emulsion containing 4 actual pounds of active ingredient—to 3 gallons of water.
  - Ciodrin. Mix 2 pints of an emulsion containing 2 actual pounds of active ingredient—to 3 gallons of water.

Instructions: use only as a water mist. Do not wet or soak the hide. If needed, apply daily. Use 1 to 2 fluid ounces per animal of either material, primarily to head, neck, shoulders, and legs. Sprayers or treadle machines are used to apply this treatment.

4. **Water spray:**

- Ciodrin. Mix 2 gallons of an emulsion containing 2 actual pounds of active ingredient—to 100 gallons of water.

Depending on the size of the animals and the thickness of the hair coat, apply 1 pint to 2 quarts, spraying thoroughly. (Note: 1 pint to 1 quart are usually applied to stanchioned animals; 1 to 2 quarts for animals treated in pens or corrals.)

*Do not use this treatment more often than 7 days.*

#### WARNING:

- For any treatment: avoid contamination of feed, drinking water, milk and milking equipment.

#### Sarcoptic mange

This trouble is caused by a mite. It bores into the hide; the skin of the infested animal is rough and scabby. The damage done by the mite may also thin the hair.

For control, get instructions from your county agricultural agent.

### FLY CONTROL IN DAIRY BARN AND MILK HOUSES

A number of flies infest barns and milking parlors, including house flies, stable fly, and other closely related kinds. The common adult house fly is about  $\frac{1}{8}$  inch long, grayish, with some yellow coloring on head and abdomen. It may live as long as 2 months during the summer. A few survive the winter.

During periods of rain and warm weather, house flies can develop from egg to adult in about 10 to 18 days. Drought or cool summer conditions normally do not favor their rapid development. As a result, they are more numerous in some years than in others.

The lesser house fly is found throughout Michigan. Although slightly smaller than the common house fly, it has the same grayish color. Its habit of hovering in mid-air tends to separate it from the common house fly, which interrupts its flight to rest on ceilings, light bulbs, and many other objects.

The stable fly is  $\frac{1}{8}$  inch long and grayish in color. It differs from the house fly in having 7 round dark spots on top of the abdomen and mouth parts formed into a piercing and sucking beak. Both males and females live on blood.

Flies in dairy and beef barns can be controlled in one or more ways. The best method depends on the type of barn to be treated.

#### Prevent fly breeding

Keep manure spread on the land or piled and treated during summer months when flies can breed in it. Drain or fill all low areas in yards and barns. Low spots filled with water and manure are excellent breeding places for flies.

Several kinds of flies develop in grass silage and around silos. Keep these places well drained. Do not use an insecticide where it could contaminate the silage.

#### Types of control

##### Space sprays (mists) or fog treatments:

Mist sprays and fogs discharged in the air are most effective in closed barns. The materials suggested for space sprays or fog treatments are not to be applied directly to cattle for fly control unless other Sections of this bulletin give instructions to do so. Space sprays or fogs do not produce residues and are not long lasting.

##### Warnings about these controls

1. Read the label before using any insecticide.
2. Milk should not come in contact with any chemical which may contaminate it.
3. Chemically treated manure should not be applied to any areas in which vegetables are grown, unless specific materials are approved for such vegetables.
4. Do not contaminate feed, mangers, watering cups, milking equipment, or milk with insecticides.

##### Chemicals for space (mist) or fog treatments

Use only one of the following materials at a time:

- Pyrethrum, 1/10 of 1% pyrethrins and 1% piperonyl butoxide in superior deodorized kerosene. Apply one ounce of this mixture for every 3,000 cubic feet of space. This treatment can be used every day in summer, if needed. The fog should settle for 2 minutes before opening windows and doors for ventilation.

**NOTE:** To treat dairy animals at the same time, stanchion or hold animals in the barn when the fog or mist is applied.

• Dichlorvos,  $\frac{1}{2}$  oil mixture. Apply  $\frac{1}{2}$  pints (12 fluid ounces) to each 3,000 cubic feet of barn space.

• Naled, 1% oil mixture. Apply 1 fluid ounce to each 3,000 cubic feet of barn space.

#### WARNINGS:

- Apply dichlorvos and naled oil solutions *only as mists or fogs*.
- Do not apply dichlorvos mists or fogs if animals have been sprayed with it within 8 hours or while they are in the barn.
- And naled oil solution is not to be applied directly to the animals or while they are in the barn.

**Instructions and equipment for space and fog treatments:** Apply to enclosed barns. Use a 4-nozzle, single unit electrical fogger producing at least 10 PSI of air pressure and  $\frac{3}{4}$  cubic feet of free air per minute. Place the unit near the center of the barn at the ceiling and direct a nozzle to each corner of the barn. Two units should be used in barns more than 60 feet in length. The units may be placed toward each end of the barn.

#### Residual sprays (lasting more than a few days)

When it is impossible to fog with pyrethrum and piperonyl butoxide, dichlorvos, and naled try residual wall and ceiling sprays. These are best for conventional type dairy barns when the surface is clean and nonporous.

Phosphate insecticides such as malathion, dimethoate, Ciodrin, Diazinon, dichlorvos, and ronnel are usually effective for 2 to 6 weeks depending on the type of walls treated, the temperature, and the number of flies.

**NOTE:** You can use residual sprays alone or with baits or space sprays. Space or fog treatments ordinarily do not require other treatments.

#### Residual sprays for treating inside walls and ceilings of barns

Barn surfaces vary in the amount of spray that can be applied to them. For example, smooth surfaces take less, rough ones more. The instructions for each insecticide are a guide to how much to

apply. However, no more gallons of spray than given should be used to 1000 square feet of barn surface.

Use one of the following to 25 gallons of water:

1. *Dimethoate*, 1 gallon of an emulsion containing 2 pounds of chemical per gallon. Apply 1 gallon of the mixture to 1,000 square feet.
2. *Malathion*, 8 pounds of 25% wettable powder or 3 pints of an emulsion containing 5 pounds of chemical per gallon. Apply 1 to 2 gallons of the mixture to 1,000 square feet.
3. *Diazinon*, 4 pounds of 50% wettable powder or  $\frac{1}{2}$  gallon of an emulsion containing 4 pounds of chemical per gallon. Apply 1 to 2 gallons of the spray to each 1,000 square feet of barn surface.
4. *Ronnel*, 1 gallon of an emulsion containing 2 pounds of active ingredient per gallon. Apply 1 to 2 gallons of the spray to each 1,000 square feet of barn surface.
5. *Dichlorvos*, 1 quart of an emulsion containing 4 pounds of chemical per gallon. Apply 1 quart of the spray to each 1,000 square feet of barn surface.
6. *Ciodrin*, 1 gallon of an emulsion containing 2 pounds of chemical per gallon. Apply 1 gallon per 1,000 square feet of wall surface.

Smaller amounts of spray than 25 gallons may be mixed as follows:

1. For each pint of emulsion mixed with 25 gallons of water, use 4 teaspoonfuls to 1 gallon of water; 12 teaspoonfuls to 3 gallons; 20 to 5 gallons.

#### NOTE:

3 teaspoonfuls = 1 tablespoonful

2 tablespoonfuls = 1 fluid ounce

16 tablespoonfuls = 1 cup

8 fluid ounces = 1 cup

2. For each pound of wettable powder mixed with 25 gallons of water, use 4 level tablespoonfuls to 1 gallon of water.

**Instructions for use and warnings:** The following instructions apply equally well to malathion, Diazinon, ronnel, dimethoate, dichlorvos, and Ciodrin:

1. When flies become annoying, apply treatments, especially to resting places. Repeat as needed.
2. In those places where flies seem resistant to insecticides or hard to control, *tighten up on sanitary practices.*
3. Do not apply wall or ceiling sprays to feed, feed mangers or watering cups. *Keep animals out of barns while spraying.*
4. Do not use any of these materials in milk houses.
5. Do not contaminate milk or milking equipment under any circumstances.
6. Baits can be used to supplement wall and ceiling sprays.

#### **Cords, resin vaporizers, and residual bands**

Use these with baits. Generally, wall and ceiling sprays are not needed with fly cords, resin vaporizers, or residual bands. Fly cords are made by treating heavy-type cord string (about one-eighth inch diameter) with parathion, Diazinon, or other suitable materials. Resin vaporizers comprise plastic-like bands from which such materials as dichlorvos vaporize. Plastic residual bands contain Dimetilan.

**Instructions and warnings:** Fly cords are dangerous to make. Hence, buy treated cords; follow label instructions carefully when hanging it inside barns. Fly cords can be used in milking parlors. Hang them away from coolers. Use dichlorvos-resin vaporizers and residual bands according to manufacturer's directions.

#### **Baits**

Use one of the following dry or wet baits.

**Dry Baits:** Use 1% ronnel or dichlorvos; or 1 or 2% Diazinon or trichlorfon (Dipterex); or 3% malathion, or 1/2% naled (Dibrom). Follow manufacturer's label directions carefully.

**Wet Baits:** A. Use 1/2 pint of a malathion emulsion containing 5 pounds of chemical per gallon plus 1 cup of sugar syrup to 3 gallons of water. Apply with a sprinkling can or other suitable equipment. B. Use

1/10% Dipterex or Diazinon, or 1/2% naled, or 2% ronnel liquid bait. Follow label directions carefully.

**Instructions and warnings:** (1.) Apply baits to clean cement or areas where flies gather. These places are usually sunlit. (2.) Do not apply baits where animals can slip and fall. (3.) Baits can be used in milking parlors. Do not use in milk houses. (4.) Baits can be used alone or with wall and ceiling sprays. (5.) Do not contaminate milking equipment, milk, or feed.

#### **Control in milk house**

Occasionally flies, other insects, and a few spiders and mites infest the milk house. Keep doors and windows well screened. Chemical control for flies can be accomplished by using fly cords, sprays, or aerosols. For a spray, use: 1% emulsifiable pyrethrins, 1 pint to 2 1/2 pints of water. Apply to 1,000 square feet of wall surface. A pyrethrum aerosol containing 6/10% of chemical may also be used. Keep the milk room closed for 10 minutes after filling it full of mist.

Pyrethrum spray is preferred to pyrethrum aerosols for control of mites and other hard to control pests in milk houses, unless the aerosols are liquid types.

**WARNING:** Do not contaminate milk with pyrethrum.

#### **Fly maggots in manure**

Treat manure or manure piles with one of the following insecticides to 25 gallons of water:

1. *Diazinon*, 4 pounds of 50% wettable powder.
2. *Malathion*, 3 pints of an emulsion containing 5 pounds of chemical per gallon or 8 pounds of 25% wettable powder.
3. *Ronnel*, 1 gallon of an emulsion containing 2 pounds of active ingredient per gallon.
4. *Dichlorvos*, 2 quarts of an emulsion containing 4 pounds of chemical per gallon.
5. *Dimethoate*, 1 gallon of an emulsion containing 2 pounds of chemical per gallon.

Wet the surface of the manure. It is not necessary to soak it. Repeat as needed.

**WARNINGS:** Do not apply Diazinon, dimethoate, malathion, ronnel, or dichlorvos to livestock unless

the package label or Michigan State University literature gives instructions to do so. Chemically treated manure should not be applied to any areas in which vegetables are grown, unless specific materials are proved for such vegetables.

Another treatment for manure piles is a half and half mixture of Cyanamid and super-phosphate. Apply 1 pound of this mixture to each bushel of manure or to each 2 square feet of the surface of the manure pile. Wet the treatment down immediately after applying but avoid drenching. The Cyanamid-super-phosphate treatment also adds fertilizer to the manure.

Sprays for fly control outside barns: Use dimethoate, malathion, Diazinon, ronnel or dichlorvos, as given for treating inside walls and ceiling of barns. Follow carefully all label instructions for use outside

dairy barns. In particular, do not apply to food and feed crops.

Sprays for feed lots: Regular removal of manure from these areas is absolutely required for fly control. For sprays around fences, over manure piles and inside walls of loafing pens, use *Ciodrin*, *dichlorvos*, or *ronnel* as given for treating inside walls and ceilings of barns.

#### WARNINGS:

- Do not spray the animals directly with these materials.
- Avoid treating cattle resting areas. Keep these clean and well bedded.