

Nebraska Management Guide for Insect Pests of Livestock and Horses

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Insecticides are chemical controls that are either naturally derived or synthesized that can provide effective insect control options for livestock and horses. Major benefits associated with the use of insecticides are their effectiveness, speed, and ease of controlling pests, which improves animal well-being and an increase in animal productivity. Various formulations, active ingredients (AI), and application methods are available to meet the diverse needs of livestock producers. This publication provides a quick guide to the selection and safe use of insecticides on animals.

Precautions

- Always read and understand label recommendations before opening a pesticide container. Preparation, application rate, use, and special instructions or restrictions are on the label.
- All insecticides can be hazardous to man and animals if not used correctly. Some livestock insecticides are not labeled for lactating dairy cattle.
- Observe the label for the minimum time between treatment and slaughter for beef cattle, treatment and freshening for dairy cattle and re-treatment intervals.
- Please observe and follow the label restrictions for treatment in conjunction with other insecticides or medication with sick or stressed animals and restrictions on age of animals to be treated.
- Never use insecticides not labeled specifically for use on horses.

Restricted Use Insecticides

Restricted use insecticides are marked with a ®. To purchase and use this type of insecticide, EPA certification is required. Once a restricted use insecticide has been applied, records of the application must be kept for a minimum of three years.

Signal Words

The insecticide label contains various warnings and precautions. On the front panel of each insecticide container, there are signal words that indicate the toxicity and/or hazards associated with its use. Insecticides with the greatest hazard are Category I, and labels of these products carry the signal word: **DANGER**. Some may contain the word “**Poison**” with the signal words and a skull and crossbones symbol, all in red. Moderately hazardous insecticides are Category II and carry the word: **WARNING**. Less hazardous insecticides carry the word: **CAUTION**. All insecticide labels must also contain the statement, “**KEEP OUT OF THE REACH OF CHILDREN.**”

Disclaimer

Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by University of Nebraska Cooperative Extension is implied.

Insecticide Formulations

There are a variety of formulations for insecticides used to treat pest problems associated with livestock. Each formulation contains the active ingredient (AI) plus various inert ingredients. These are used to improve the performance of the insecticide by affecting such characteristics as handling, safety, ease of application, and ability to mix with water or another solute.

Table 1a. Types of Insecticide Formulations (Liquid)

| <i>Liquid Formulations</i> | <i>Properties</i> | <i>Advantages</i> | <i>Disadvantages</i> |
|-------------------------------|--|--|--|
| Emulsifiable concentrate (EC) | Mix with water to form an emulsion. | Little agitation and easy to handle. | Easily absorbed through skin of animals and humans. |
| Solution (S) | Substance dissolved in a carrier. | Cannot be mechanically separated. | |
| Flowables (F) | (AI) that does not dissolve in water or oil. | Easy to handle. | Require moderate agitation. Abrasive to nozzles and pumps. |
| Aerosols (A) | One or more (AI) and a solvent, low percentage of (AI), pressurized container. | Ready to use, retain potency over time, and easily stored. | Limited uses, risk of inhalation, difficult to confine to target pest. |
| Microencapsulated (M) | Insecticide particles are covered with plastic coating. | Delayed or slow release of (AI). | Hazardous to bees. |

Table 1b. Types of Insecticide Formulations (Dry)

| <i>Dry Formulations</i> | <i>Properties</i> | <i>Advantages</i> | <i>Disadvantages</i> |
|-------------------------|---|--|---|
| Dusts (D) | Low percentage of (AI), with a very fine inert carrier. | Ready to use. | Damp conditions cause clogging and lumping. |
| Wettable Powders (WP) | Finely ground material mixed with water. | Longer residual activity, easily mixed with carrier. | Requires constant agitation. Residues may be visible. |
| Soluble Powders (SP) | Dissolves readily in water. | Same advantages as wettable powders. | Few insecticides available. |
| Dry Flowables (DF) | Small granules mixed with water. | Low in dust, cause less inhalation. | Requires constant agitation. |
| Microencapsulated (M) | Insecticide particles are covered with plastic coating. | Delayed or slow release of (AI). | Hazardous to bees. |
| Baits (B) | (AI) mixed with food or another attractive substance. | Ready to use, control pests which move in and out of area. | Can be attractive to children and pets. |

Insecticides can be systemic or non-systemic. Systemic insecticides are absorbed through the skin and into the animals' blood stream and tissues to kill blood-feeding arthropods or arthropods that spend part of their life cycle as internal parasites (grubs and bots). Endectocides or macrocyclic lactones are veterinary parasiticides that include the avermectins (abamectin, doramectin, eprinomectin, and ivermectin) and the milbemycins (moxydectin). These control both internal and external parasites.

Insecticide Application Methods

Animal Sprays — Systemic insecticides are applied with high pressure sprayers that require at least 300 pound per square inch (psi) to reach the skin and require animals to be confined to a corral or cattle chute. Non-systemic insecticides are applied with sprayers that require a spray pressure of between 30-40 psi. These types of sprayers are often mounted on All Terrain Vehicles (ATV's) or Utility Terrain Vehicle's (UTV's) and in many situations may permit the application to be made with restraining the animals. Mist blower sprayers can also be used to apply animal sprays in this case most of the applications are made in the pasture.

Area Sprays — These types of sprays provide a rapid but short-term control of flies present during treatment. Application is usually made with foggers, mist blower sprayers or aircraft.

Residual Sprays — Insecticides applied in this manner are directed to walls, ceilings, and other locations where flies rest. These sprays are applied with hydraulic sprayers, low pressure sprayers, or hand pump sprayers. Residual spray materials usually provide control for several weeks.

Pour-ons — Pour-on insecticides are ready-to-use (RTU) formulations that are applied in measured doses to animals based on body weight.

Self-treatment Devices — Dust bags, oilers and insecticide ear tags can be considered self-treatment devices. Dust bag and oilers work best when placed in a forced-use situation. Ear tags are designed to release small amounts of product during animal movement and grooming. Follow label application directions and insecticide resistance management practices when using ear tags.

Injections — Many of the endectocides have an injectable formulation which is administered with a syringe. There are also pour-on formulations. Normally, the animal health industry recommends injectable formulations for internal parasite control, and pour-ons for external parasite control. Injectable formulations are more effective against internal parasites, while pour-ons are more effective against external parasites.

Baits — Fly baits should be placed in areas where house flies gather to provide a temporary reduction in numbers. Baits should be used in conjunction with other fly control methods such as sanitation, residual, and space sprays. Do not place baits in areas accessible to animals, children, and pets.

Oral Larvicides (feed additives and boluses) — Oral larvicides are insecticides that are incorporated in mineral blocks or loose mineral. The insecticide is passed through the digestive system of an animal with little absorption and is passed out into the manure preventing the fly larvae from developing into an adult fly. Feed additives must be consumed on a daily basis for this treatment method to be successful. A bolus, a large pill-like formulation, works in a similar fashion except the bolus remains in the animal's reticulum and slowly dissolves over time.

Table 2. Insecticide Recommendations for Cattle Grub Control

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|---|---------------------------|--|--|
| Coumaphos (Co-Ral) 11.6 EC | High Pressure Spray | See label | Treatment-slaughter interval of 14 days. |
| Doramectin (Dectomax) | Injection | 1 cc/110 lb | Treatment-slaughter interval of 35 days. Do not treat lactating dairy cows or heifers over 20 months of age. |
| | Pour-on | 1 ml/22 lb | |
| Eprinomectin (Eprinex) | Pour-on | 1 ml/22 lb or 5 ml/110 lb | No treatment-slaughter interval. No restrictions on dairy cattle. |
| (LongRange) | Injection | 1 ml/110 lb | Not for breeding bulls, calves less than 3 months of age, or female dairy cattle 20 months of age or older. |
| Gamma-cyhalothrin (StandGuard) 0.5% | Pour-on | 0.5% AI < 600 lb = 10 ml >600 lb = 15 ml | Do not apply more than once every 14 days and do not apply more than 4 times within a 6-month period. |
| Ivermectin (Ivomec) many generics | Injection | 1 cc/110 lb | Treatment-slaughter interval of 48 days. Do not use in female dairy cattle of breeding age. Do not use in calves processed for veal. |
| | Pour-on | 1 ml/22 lb | |
| Moxidectin (Cydectin) | Pour-on | 1 ml/22 lb or 5 ml/110 lb | No treatment-slaughter interval. No restrictions on dairy cattle. |

Table 3. Insecticide Recommendations for Horn Fly Control

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|---|---------------------------|------------------------------------|--|
| Abamectin (XP820) 8% + 20% PBO | Ear tag | 2 tags/animal | Do not use on lactating cattle. |
| Coumaphos (Co-Ral) - 1% Dust | Dust | | Repeat as needed. |
| 6.15% EC | Spray | 2 qt/50 gal of water | Not for use on lactating dairy cattle. Do not treat animals younger than 3 months. Do not make applications less than 10 days apart. |
| (Corathon) 15% + 35% diazinon | Ear tag | 2 tags/adult animal, 1 tag/calf | |
| Beta-cyfluthrin 8% + 20% PBO (Cylence Ultra) | Ear tag | 2 tags/adult animal | Calves less than 3 months of age should not be tagged. |
| Diflubenzuron (ClariFly) | IGR Feed Additive | 0.67% AI | Follow label directions. |
| Doramectin (Dectomax) | Injection | 1 cc/110 lb | Treatment-slaughter interval of 35 days. Do not treat lactating dairy cows or heifers over 20 months of age. |
| | Pour-on | 1 ml/22 lb | |
| Eprinomectin (Eprinex) | Pour-on | 5 ml/110 lb | No treatment-slaughter interval. No restrictions on dairy cattle. |

Table 3. Insecticide Recommendations for Horn Fly Control (continued)

| Insecticide | Application Method | Application Rate | Restrictions and Comments |
|--|---------------------------|---|--|
| Ivermectin (Ivomec) | Injection | 1 cc/110 lb | Treatment-slaughter interval 49 days. |
| (Ivomec) many generics | Pour-on | 1 ml/22 lb | Treatment-slaughter interval of 48 days. Do not use in female dairy cattle of breeding age. Do not use in calves processed for veal. |
| Lambda-cyhalothrin (Saber Extra) 10% + 13% PBO (Double Barrel VP) 6.8% +14% Pirimiphos methyl | Ear tag | 2 tags/adult animal | |
| (Saber) 1% | Pour-on | Less than 600 lb = 10 ml; more than 600 lb = 15 ml | No more than 4 applications during a 6-month period. |
| (Ultra Saber) | Pour-on | 1% AI, less than 600 lb = 10 ml More than 600 lb = 15 ml | No more than 4 applications during a 6-month period. |
| AiM-L VETCAPS 1.5% + 7.5% PBO | Spot | 1 capsule/600 lb | Smart Vet applicator required. |
| Methoprene (Altosid) 0.4% | Mineral Additive | 0.2 oz – 0.4 oz/100 lb per 30 days | Follow label directions. |
| Moxidectin (Cydectin) | Pour-on | 1 ml/22 lb or 5 ml/110 lb | No treatment-slaughter interval. No restrictions on dairy cattle. |
| Permethrin (Atroban) 11% EC | Spray | 1 pt/25 gal of water | Spray to thoroughly wet animal. |
| (Atroban) 42.5% EC | Spray | | Follow label directions. |
| (Boss) 5% | Pour-on | 3 ml/100 lb | Maximum of 30 ml per animal. |
| (Ultra Boss) 5% + 5% PBO | Pour-on | 3 ml/100 lb | Maximum of 30 ml per animal. |
| (Brute) 10% | Pour-on | 2.5 ml/200 lb | Do not treat more than once every 2 weeks. |
| (DeLice Synerigized) 1% + 1% PBO | Pour-on | 15 ml/100 lb | Maximum of 5 oz per animal. Do not treat more than once every 2 weeks. |
| (Gardstar Plus) 10% | Ear tag | 2 tags/animal | |
| (Gardstar) 40% EC | Spray | 30-118 ml to 25 gals of water | Spray to thoroughly wet animal. |
| (Permethrin) 1% | Pour-on | .5 oz/100 lb | Maximum of 5 oz per animal. Do not treat more than once every 14 days. |
| (Permethrin CDS) 7.4% + 7.4% PBO | Pour-on | 1.5 -2.0 ml/100 lb | Maximum of 20 ml per animal. Do not treat more than once every 14 days. |
| (Permethrin II) 10% EC | Spray | 1 pt/100 gal water | Spray to thoroughly wet animal. |
| (Permethrin) 0.25% | Dust | See label | Do not use in pyrethroid resistant areas. |
| (Prozap Insectrin X) 10% EC | Spray | 1 pt/100 gal water | Spray to thoroughly wet animal. |

Table 3. Insecticide Recommendations for Horn Fly Control (continued)

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|--|---------------------------|----------------------------------|--|
| Phosmet (Prolate/Lintox-HD) 11.75% EC | Spray | 1 qt/60 gal water | Treatment-slaughter interval 3 days. Do not treat non-lactating dairy cattle within 28 days of freshening. |
| | Backrubber | 1 gal/50 gal suitable carrier | |
| Pirimiphos-methyl (Dominator) 20% | Ear tag | 2 tags/animal | |
| (Double Barrel VP) 14% + 6.8% Lambda-cyhalothrin | Ear tag | 2 tags/animal | |
| Stirofos (Rabon) 3% | Dust | | Follow label directions. |
| (Rabon) 50% WP | Spray | 4 lb/75 gal water | Apply 0.5 to 1 gal per animal. |
| (Rabon ROL) 7.76% | Larvicide Pre-mix | | Follow label directions. |
| (Ravap) 23% + 5.3% Vapona) EC | Spray | 1 qt/25 gal water | Do not apply to calves under 6 months of age. Follow label directions. |
| | Backrubber | 1 gal/25 gal of approved carrier | Follow label directions. |
| Zeta-cypermethrin (PYthon) 0.075% + 0.15% PBO | Dust | | Follow label directions. |
| (PYthon)10% (9.5 g) + 20% PBO (9.5 g) | Ear tag | 2 tags/animal | |
| (PYthon MagnuM) 10% (15.4 g) + 20% PBO (15.4g) | Ear tag | Only 1 tag/animal | Do not apply to calves under 3 months of age. |
| (Python Insecticide Cattle Strip) 10% + 20% PBO | Ear Tag Strip | 2 strips/animal | Apply to existing identification (ID) tags. Follow label directions. |

Table 4. Insecticide Recommendations for Face Fly Control

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|---|---------------------------|------------------------------------|--|
| Abamectin (XP820) 8% + 20% PBO | Ear tag | 2 tags/adult animal | Do not apply to lactating cows. |
| Beta-cyfluthrin (Cylence Ultra) 8% + 20% PBO | Ear tag | 2 tags/adult animal | Calves less than 3 months of age should not be tagged. |
| Coumaphos (Co-Ral) 1% | Dust | | Repeat as needed. |
| (Corathon) 15% + diazinon 35% | Ear tag | 2 tags/adult animal, 1 tag/calf | Do not apply to lactating cows. |
| Diazinon (Optimizer) 20% | Ear tag | | |
| (Patriot) 40% | Ear tag | 2 tags/adult animal | |
| (Warrior) 30% diazinon + 10% Chlorpyrifos | Ear tag | | |

Table 4. Insecticide Recommendations for Face Fly Control (continued)

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|---|---------------------------|----------------------------------|--|
| Diflubenzuron (ClariFly) 0.67% | IGR Feed Additive | | Follow label directions. |
| Lambda-cyhalothrin (Saber Extra) 10% + 13% PBO | Ear tag | | |
| (Double Barrel VP) 6.8% + 14% Pirimiphos methyl | Ear tag | 2 tags/adult animal | |
| Permethrin (Atroban) 11% EC | Spray | 1 pt/25 gal of water | Spray to thoroughly wet animal. |
| (Gardstar Plus) 10% | Ear tag | 2 tags/animal | Spray to thoroughly wet animal. |
| (Gardstar 40% EC) | Spray | 30-118 ml to 25 gals of water | Spray to thoroughly wet animal. |
| (Permethrin II) 10% EC | Spray | 1 pt/100 gal water | Spray to thoroughly wet animal. |
| (Prozap Insectrin X) 10% EC | Spray | 1 pt/100 gal water | Spray to thoroughly wet animal. |
| Piriimiphos-methyl (Dominator) 20% | Ear tag | | |
| (Double Barrel VP) 14% + 6.8% Lambda- cyhalothrin | Ear tag | 2 tags/animal | |
| Stirofos (Rabon) 3% | Dust | | Follow label directions. |
| (Rabon) 50% WP | Spray | 4 lb/75 gal water | Apply 0.5 to 1 gal per animal. |
| (Rabon) 7.76% ROL | Larvicide Pre-mix | | Follow label directions. |
| (Ravap) 23% + 5.3% Vapona EC | Spray | 1 qt/25 gal water | Do not apply to calves under 6 months of age. Follow label directions. |
| | Backrubber | 1 gal/25 gal of approved carrier | Follow label directions. |
| Zeta-cypermethrin (PYthon) 0.075% + 0.15% PBO | Dust | | Follow label directions. |
| (PYthon) 10% (9.5 g) + 20% PBO (9.5 g) | Ear tag | 2 tags/animal | |
| (PYthon MagnuM) 10% (15.4 g) + 20% PBO (15.4g) | Ear tag | Only 1 tag/animal | Do not apply to calves under 3 months of age. |
| (Python Insecticide Cattle Strip) 10% + 20% PBO | Ear tag strip | 2 strips/animal | Apply to existing identification (ID) tags. Follow label directions. |

Table 5. Insecticide Recommendations for Cattle Lice Control

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|---------------------------------------|---------------------------|---|--|
| Amitraz (Tactic) 12.5% EC | Spray | 1 pt/50 gal | No restrictions. |
| Coumaphos (Co-Ral) 6.15% EC | Spray | 5 oz/4 gal | No more than 6 applications per year. Do not make applications less than 10 days apart. |
| Cyfluthrin (CyLence) 1% | Pour-on | 4 ml/400 lb | Repeat in 3 weeks. |
| Doramectin (Dectamax) | Injection | 1 cc/100 lb | Not for female dairy cattle over 20 months of age. |
| | Pour-on | 1 ml/22 lb | |
| Eprinomectin Eprinex | Pour-on | 1 ml/22 lb | Follow label directions. |
| Ivermectin (Ivomec) | Injection | 1 ml/110 lb | Treatment-slaughter interval of 49 days. |
| (Ivomec) Many generics | Pour-on | 1 ml/22 lb | Treatment-slaughter interval of 48 days. Do not use in female dairy cattle of breeding age. Do not use in calves processed for veal. |
| Lambda-cyhalothrin (Saber) 1% | Pour-on | Less than 600 lb = 10 ml; more than 600 lb = 15 ml | Do not apply more than once every 2 weeks. No more than 4 applications during a 6-month period. |
| (Ultra Saber) 1% + 5% PBO | Pour-on | Less than 600 lb = 10 ml; more than 600 lb = 15 ml | Do not apply more than once every 2 weeks. No more than 4 applications during a 6-month period. |
| Moxidectin (Cydectin) | Injection | 1 ml/110 lb | No restrictions. |
| | Pour-on | 1 ml/22 lb | |
| Permethrin (Atroban) 11% EC | Spray | 1 pt/25 gal of water | |
| (Boss) 5% | Pour-on | 3 ml/100 lb | Maximum of 30 ml per animal. |

Table 5. Insecticide Recommendations for Cattle Lice Control (continued)

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|-----------------------------------|---------------------------|-------------------------|--|
| (Ultra Boss) 5% + 5% PBO | Pour-on | 3 ml/100 lb | |
| (Brute) 10% | Pour-on | 3 ml/200 lb | Do not treat more than once every 2 weeks. |
| (DeLice) 1% | Pour-on | 15 ml (.5 oz) /100 lb | Maximum of 5 oz per animal. |
| (DeLice Synergized) 1% + 1% PBO | Pour-on | 15 ml (.5 oz) /100 lb | Do not apply more than once every 2 weeks. Maximum of 5 oz per animal. |
| (Clean-up) 5% + 5% Diflubenzuron | Pour-on | 3 ml/100 lb body wt | 30 ml maximum. |
| (Gardstar) 40% EC | Spray | 4 oz/25 gal water | Spray to thoroughly wet animal. Repeat in 14 days. |
| (Permethrin) 10% EC | Spray | 1 pt/100 gal water | Spray to thoroughly wet animal. |
| (Permethrin) 1% | Pour-on | .5 oz/100 lb body wt | Maximum of 5 oz per animal. Do not treat more than once every 2 weeks. |
| (Permethrin CDS) 7.4% + 7.4% PBO | Pour-on | 2 ml/100 lb body wt | Maximum of 20 ml per animal. |
| Pyrethrins (PyGanic) 5% | Spray | 1.5 oz/2 gal water | Spray to thoroughly wet animal. Repeat in 10 days. |

Table 6. Insecticides Recommended for Control of House Flies and Stable Flies In and Around Livestock Facilities

| Mist or Area Sprays | | | |
|--|---------------------------|-------------------------|---|
| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
| Dichlorvos (Vapona) Insecticide Dairy Cattle Spray 1% | Spray | | RTU (Ready-To-Use). Read label before use. |
| (Vapona) 40.2% EC | Mist/fog | 1 qt/50 gal water | Restricted Use Pesticide. |
| Permethrin (Gardstar) 40% EC | Spray/Mist | | |
| (Insectrin X) 10% EC | | | |
| (Permethrin II) 10% EC | | | |
| Pyrethrins (PyGanic) 5% | Spray/Mist | | OMRI Listed |

| Residual Sprays | | | |
|---|---------------------------|--|--|
| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
| Bifenthrin (ActShield 7.9%) | Spray | 0.33 to 1 fl oz Per 1000 sq ² ft | Follow label instructions. |
| Beta-cyfluthrin (Tempo SC) 11.8% | Spray | 8-16 ml/gal water | Do not apply when animals are present. Apply 2 gallons/ 1000 sq ² ft. |
| Lamda-cyhalothrin (Grenade ER) 9.7% | Spray | 12-24 ml/gal water | Apply 1 gal/1000 sq ² ft |
| Permethrin (Atroban) 11% EC | Spray | 1 pt/10 gal water | Covers 750-1000 sq ² ft. Spray to runoff. |
| (Gardstar) 40% EC | Spray | | Follow label instructions. |
| Stirofos (Rabon) 50% WP | Spray | 4 lb/25 gal water | Apply 1 gal of mix per 500 sq ² ft. |
| (Ravap EC) 23% + 5.3% Dichlorvos | Spray | 1 gal/25 gal water | Apply 1 gal/500-1000 sq ² ft. Restricted Use Pesticide. |
| Spinosad (Elector PSP) 44.2% | Spray | 2 oz/10 gal water | |

| Baits | | | |
|---|---------------------------|-------------------------|---|
| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
| Dinotefuran (QuikStrike) 0.50% + 0.04% (Z)-9-Tricosene | Bait | | Follow label instructions. |
| Imidacloprid (Quick BAYT) 0.5% + Muscalure Z9 Tricosene 0.1% | Bait | | Do not put in areas accessible to animals, children and pets. Follow label instructions for application. |
| Methomyl (Golden Malrin, Apache) 1% Methomyl + 0.049% Z-9 Tricosene | Bait | | |
| Spinosid (Elector) 0.5% + 0.04% (z)-9 Tricosene | Bait | | |
| Beauveria bassiana (balEnceBait) | Bait | | Labeled Organic. |

Table 6. Insecticides Recommended for Control of House Flies and Stable Flies In and Around Livestock Facilities (cont'd)

| Larvicides | | | |
|------------------------------------|---------------------------|--------------------------------------|--|
| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
| Cyromazine (NepoRex) 2SG | Dry or Spray | | Covers 116/200 sq ² ft. For larval control in manure or animal bedding only. |
| Stirofos (Rabon) 50% WP | Larvicide | 1 gal/100 sq ft of fly breeding area | |

| Feed Additives | | | |
|---|---------------------------|-------------------------|--------------------------------------|
| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
| Stirofos (Rabon) 7.76% or 93.3%, or 1.23% ROL | Feed additive | | For beef, follow label instructions. |

Table 7. Insecticide Suggestions for Management of Hog Lice

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|--|---------------------------|-------------------------|--|
| Amitraz (Taktic) 12.5%EC | Spray | 760 ml/100 gal water | Treatment-slaughter interval of 3 days. |
| Coumaphos (Co-Ral) 1% | Dust | 1 oz/animal | Retreat in 10 days. Treatment-slaughter interval of 0 days. |
| (Co-Ral) 6.15%EC | Spray | 1 qt/25 gal water | Treatment-slaughter interval of 10 days. Do not treat animals less than 3 months old. |
| Doramectin (Dectomax) 1% | Injection | 1 ml/75 lb body wt | Treatment-slaughter interval of 24 days. |
| Ivermectin (Ivomec) 0.27% | Injection | 1 ml/20 lb body wt | Suckling and feeder pigs. Subcutaneous in neck. |
| (Ivomec) 1% | Injection | 1 ml/75 lb body wt | Treat sows 7-14 days prior to breeding. Treat boars twice yearly. Treatment-slaughter interval of 18 days. |
| Permethrin (Atroban) 11% EC | Spray | 1 qt/50 gal water | Treatment-slaughter interval of 5 days. |
| (Gardstar) 40% EC | Spray/Dip | 60-118 ml/25 gal water | Spray to thoroughly wet animal or dip animals including ears. |
| (Swine Guard) 10% | Pour-on | 2.5 ml/85 lb body wt | Repeat no more than once every 2 weeks. Treatment-slaughter interval of 5 days. |
| Phosmet (Prolate/Lintox-HD) 11.75% EC | Spray/Dip | 1 qt/25 gal water | Apply to point of runoff. Treatment-slaughter interval of 1 day. |
| Stirofos (Rabon) 3% | Dust | 3-4 oz/animal | No more than 1 application every 14 days. |
| (Rabon) 50% WP | Spray | 4 lb/50 gal water | Apply coarse spray using 1-2 qt per animal. Repeat in 2 weeks if necessary. |

Table 8. Insecticides Registered for Management of Swine Mange Mites

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|--|---------------------------|--|--|
| Amitraz (Tactic) 12.5% EC | Spray/Dip | 760 ml/50 gal water | Thoroughly wet animal. Treatment-slaughter interval of 3 days. |
| Doramectin (Dectomax) 1% | Injection | 1 ml/75 lb body wt | Treatment-slaughter interval of 24 days. |
| Ivermectin (Ivomec) 0.27% | Injection | 1 ml/20 lb body wt | Suckling and feeder pigs. Subcutaneous in neck. |
| (Ivomec) 1% | Injection | 1 ml/75 lb body wt | Treat sows 7-14 days prior to breeding. Treat boars twice yearly. Treatment-slaughter interval of 18 days. |
| Permethrin (Atroban) 11% EC | Spray | 1 qt/50 gal water | Thoroughly wet animal. Treatment-slaughter interval of 5 days. |
| (Gardstar) 40% EC | Spray/Dip | 0.026-0.05% AI 60-118 ml/25 gal water | Thoroughly wet animal. Spray pen, floors, sides and bedding. Repeat in 14 days. Treatment-slaughter interval of 5 days. |
| (Swine Guard) 10% | Pour-on | 3 ml/100 lb body wt | Repeat no more than once every 2 weeks. Treatment-slaughter interval of 5 days. |
| Prolate (Prolate/Lintox-HD) 11.75% EC | Spray | 0.25% AI 1 qt/25 gal water | Thoroughly wet animal. Treatment-slaughter interval of 1 day. |

Table 9. Insecticides Registered for Sheep Ked and Sheep and Goat Lice

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|--|---------------------------|---|--|
| Ivermectin (Ivomec Drench) 0.08% | Oral Drench | 3 ml/26 lb body wt | Treatment-slaughter interval of 11 days. |
| Permethrin (Atroban) 11% EC | Spray | 1 pt/25 gal water or 3 Tbsp/2.45 gal water | Thoroughly wet animal. Retreat in 14 days. |
| (Atroban / DeLice) 1% | Pour-on | 7.5 ml/50 lb body wt | Maximum of 3 oz per animal. Retreat in 14 days. |
| (Boss) 5% | Pour-on | 1.5 ml/50 lb body wt | Maximum of 18 ml per animal. Retreat in 14 days. |
| (Ultra Boss) 5% + 5% PBO | Pour-on | 1.5 ml/50 lb body wt | Maximum of 18 ml per animal. Retreat in 14 days. |
| (DeLice Synergized) 1.0% + 1% PBO | Pour-on | 7.5 ml/50 lb body wt | Maximum 3 oz per animal. Retreat in 14 days. |
| (Gardstar) 40% EC | Spray | 0.05% AI 118 ml/25 gal water | Thoroughly wet animal. Retreat in 14 days. |
| (Goat Lice Remover/ Barn & premise Spray) 8.5% + 4.25% PBO | Spray/Pour-on | Spray 4 oz/ gal of water. Pour-on up to 4 oz of diluted down the midline of the animal. | Repeat in 14 days. |
| Zetacypermethrin (Python Dust) 0.075% | Hand dust | 2 oz/animal | Repeat as necessary, but no more than once every 3 days. |

Table 10. Insecticide Suggestions for Sheep Wool Maggot

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|--|---------------------------|-------------------------|---|
| Permethrin (Catron IV) 0.50% | Aerosol | | Spray wound thoroughly, repeat every 5 to 7 days. |
| (PYthon) 0.075% | Dust | | |

Table 11. Insecticides Suggested for Treatment of Flies on Horses

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|---|---------------------------|--|--|
| Coumaphos (Co-Ral Fly and Tick Spray) 6.5% EC | Spray | 2 qt/50 gal water or 10 oz /4 gal water | For horses not intended for slaughter. No more than 6 treatments per year, no less than 10 days apart. |
| Cypermethrin (Bite Free Biting Fly Repellent) 0.15% + 0.20% pyrethrins | Spray | | |
| (Endure Sweat-Resistant Fly Spray for Horses) 0.15% + 0.20% pyrethrins | Spray | | |
| (Repel-X Lotion) 0.15% + 0.20% pyrethrins | | | |
| (Tri-tec 14 Spray) 0.15% + 0.20% pyrethrins | Spray | | |
| (Tri-Tec Concentrate Fly Spray for Horses) 0.60% + 0.8% pyrethrins | Spray | | |
| Permethrin (Atroban) 11% EC | Spray | 1 pt/25 gal water | Spray to thoroughly wet horse. Repeat every 14 days. |
| (Buss Off) 7.4% + 7.4% PBO | Wipe-on, Spray or Pour-on | | Follow label directions. |
| (Bug Block) .20% + 0.10% pyrethrins | Spray | | Apply 30-60 ml per horse. |
| (DuraGuard) 0.20% + 0.10% pyrethrins | Spray | 4.5-12.5 ml /2 gal water | Spray thoroughly to wet horse. Repeat in 14-21 days. |
| (Gardstrar) 40% EC | | 5-12.5 ml/2 gal water | |
| (Permethrin II) 10% EC | | | Spray thoroughly to wet horse. Repeat in 14-21 days |
| (Repel-35 RTU) 0.50% | | | Ready to use. |
| Pyrethrins + piperonyl butoxide 0.05 – 1.0% | Mist, Spray or Wipe-on | | Many formulations of ready to use (RTU). Follow label directions. |
| Resmethrin (Absorbine Concentrated Fly Repellent) 0.55% | | | |
| Stirofos (Rabon)7.76% ROL | Feed additive | | Follow label directions. Horn and face fly control only. |

Table 12. Insecticide Suggestions for Control of Horse Bots (Treat After Hard Freeze)

| <i>Insecticide</i> | <i>Application Method</i> | <i>Application Rate</i> | <i>Restrictions and Comments</i> |
|--|---------------------------|-------------------------|--|
| Ivermectin (Equalan) (Zimectrin)1.87% | Paste | 1 ml/100 lb body wt | Do not treat colts less than 4 months of age. Treatment-slaughter interval of 35 days. |
| Moxidectin (Quest Gel) 2.0% | Paste | 0.4 mg/2.2 lb body wt | Not for horses or ponies intended for human consumption. |

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