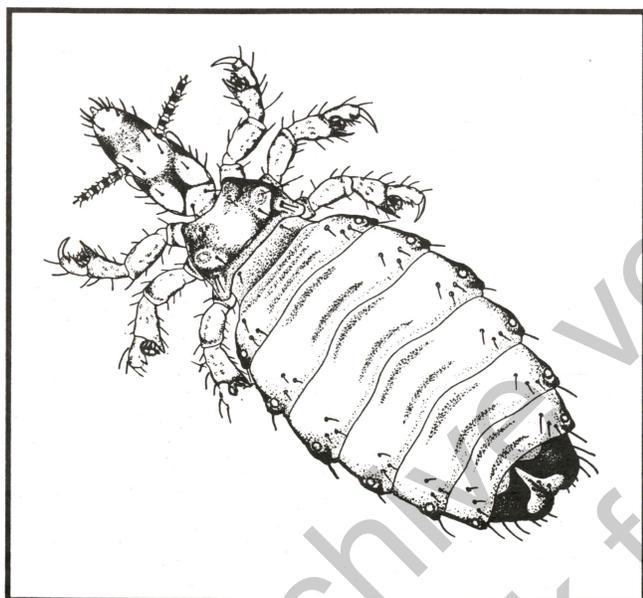


AGRICULTURAL GUIDE

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Controlling external parasites of swine

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Hog lice

The major external parasite attacking hogs in Missouri is the hog louse. These insects obtain their food by puncturing the skin of the host animal with their mouthparts, and sucking blood. Each time they feed they puncture the skin at a different place.

The irritation and itching caused by puncturing the skin causes animals to rub against any convenient object. The animals may rub off their hair in patches and may even rub hard enough to cause bleeding.

Hogs in an unthrifty condition may be more susceptible to attack by hog lice, other parasites and diseases. Louse-infested hogs, particularly young pigs, may have reduced feed efficiency.

The adult female louse may reach a length of 1/4 inch. The eggs, or "nits", are glued to the hair close to the skin. The female louse may lay 90 eggs during a

25- to 30-day period. The eggs hatch in 12 to 20 days. The young lice become mature in 10 to 12 days.

The entire life cycle is spent on the host. Hog lice do not remain attached to the skin like ticks, but detach after each feeding and may crawl around over the animal or remain quiet.

To prevent a severe louse problem from developing, treat pigs as soon as possible after weaning. (See "General Precautions" and "Restrictions"). Treat sows 30-45 days before farrowing, and treat boars before breeding season.

If new hogs are added to the herd, treat them before turning them in with those already on hand. Treat all feeder pigs in the fall. Treat purchased feeder pigs before turning them in with home-grown animals.

Mange

Mange-infested animals have reduced growth rates, reduced vitality, and may have high death rates.

Mange is a scabies or itch caused by mites. Hogs may be infested with two kinds of mange. Sarcoptic mange usually starts around the head then spreads backwards, eventually covering the entire body. The itch mites that cause sarcoptic mange live in the upper surface of the skin. These mites are small, whitish parasites with a rounded body about 1/60 of an inch in length. They may be seen with the naked eye, but a hand lens is helpful in examining skin scrapings from the suspected animal.

The affected area often takes on a dry, scurfy or leather-like appearance. Active mites cause irritation, and hogs scratch themselves, sometimes so much so that the skin becomes raw and scabby.

Sarcoptic mange is contagious and is usually transmitted by direct contact with infested animals. Man and some other animals may become infested with hog sarcoptic mange. Bathe and change clothes as soon as possible after handling mangy hogs.

To prevent sarcoptic mange from developing, treat pigs as soon as possible after weaning (See "General Precautions" and "Restrictions"). Treat sows 30-45 days before farrowing, and treat boars before breeding season.

If new hogs are added to the herd, treat them before turning them in with those hogs already on

Missouri insect control recommendations are revised periodically and are subject to change.
No discrimination is intended and no endorsement is implied.

External Parasite Control Recommendations

General Precautions:

Do not spray animals in a confined, nonventilated area.

Do not spray or dip pre-weaned pigs, or apply insecticides to sick animals or animals under stress.

Do not contaminate feed or drinking water, or allow access to run-off areas from other spraying or dipping operations.

Do not apply insecticides in conjunction with oral drenches of other internal medications, such as phenothiazene, or with natural or synthetic pyrethroids or their synergists, or with other organic phosphates.

All of the following insecticides must be handled with caution, since most of them are toxic to warm-blooded animals. Be sure to read and follow the directions and safety precautions given on the label of the insecticide containers.

Hog mange and/or hog lice

1. Amitraz (Taktic®)—Spray 0.06% amitraz, made by mixing 1 quart of 12.5% emulsifiable concentrate in 50 gallons of water. Remove or cover feed during application and use mixed spray within six hours. Nozzle pressure of 70 to 150 pounds per square inch and a coarse spray will facilitate coverage. Spray each animal to runoff. Piglets can be sprayed or dipped with this concentration. Repeat treatment in seven to ten days.
2. Fenvalerate (Ectrin® WDL) water dispersible liquid—Spray 0.05% fenvalerate, made by mixing 1 quart of 10% fenvalerate water dispersible liquid in 50 gallons of water or 1 ounce in 1.5 gallons of water. Wet the entire animal with about eight ounces of this concentration and repeat in 14 days if necessary.
3. Ivermectin (Ivomec®)—Inject ready-to-use sterile solution containing 1% ivermectin, 40% glycerol formal, and propylene glycol q.s. ad 100%. This is formulated to deliver the recommended dose level of 300 mcg/kg given subcutaneously in the neck at the rate of 1 ml (10 mg ivermectin) per 75 lb body weight. Use Table 1 as a guide.

Animals should be appropriately restrained to receive

Table 1

Type of Swine	Body Weight (lb)	Dose volume (ml)
Growing pigs	19	0.25
	38	0.50
	75	1.00
	150	2.00
Breeding animals (sows, gilts and boars)	225	3.00
	300	4.00
	375	5.00
	450	6.00

safe subcutaneous injection. Use 16- or 18- gauge needles for sows and boars, and 18- or 20-gauge needles for younger animals. Inject under the skin, immediately behind the ear. Use sterile equipment and clean the injection site with alcohol before injection. The rubber stopper should also be disinfected with alcohol to prevent contamination of the

contents.

Ivermectin has sufficient persistence to control mange mite infestations throughout the egg-to-adult life cycle. Because the effect is not immediate, prevent reinfestation by excluding untreated animals and limiting contact with contaminated facilities. Under usual conditions, pigs should not be moved to clean quarters or exposed to uninfested pigs for about one week after treatment. Sows should be treated at least one week prior to farrowing to minimize transfer of mites to the newborn baby pigs. Louse eggs are unaffected by ivermectin and may still hatch up to three weeks post-treatment; therefore, louse infestations developing from such hatching eggs may require retreatment. **IVOMEK INJECTION FOR SWINE IS FOR USE IN SWINE ONLY; MISUSE IN OTHER ANIMAL SPECIES (ESPECIALLY DOGS) MAY RESULT IN FATALITIES.**

4. Lindane—Use 0.06% lindane, as a spray or dip, made by mixing 1 quart 25% lindane emulsifiable concentrate in 100 gallons of water or 2 teaspoons in 1 gallon of water. **DO NOT** use BHC in making this preparation. **DO NOT** apply to pigs less than one month old.
5. Malathion—Use a 0.5% malathion emulsion, as a spray or dip, made by mixing 1 gallon 57% malathion emulsifiable concentrate in 100 gallons of water or 7 teaspoons in 1 gallon of water. **DO NOT** apply to pigs less than 1 month old.
6. Permethrin—Use a 0.025% permethrin spray made by mixing 1 quart of 5.7% permethrin emulsifiable concentrate in 50 gallons of water. Make a second application in 14 days.

Restrictions: **DO NOT** treat with amitraz or fenvalerate within one day of slaughter. **DO NOT** treat with ivermectin within 18 days of slaughter. **DO NOT** spray with lindane within 30 days or dip with lindane within 60 days of slaughter.

Hog lice only

1. Coumaphos (Co-Ral®)—Use 0.06% coumaphos as a spray, made by mixing 2 pounds 25% coumaphos wettable powder in 100 gallons of water, or 1 ounce in 3 gallons. Repeat as needed. DO NOT spray pigs less than three months old with coumaphos.
- 2.* Dioxathion (Delnav®)—Use 0.15% dioxathion, as a spray or dip, made by mixing 2 quarts 30% dioxathion livestock emulsifiable concentrate in 100 gallons of water, or 4 teaspoons in 1 gallon. DO NOT dip pigs less than three months of age or treat sows within two weeks of farrowing.
3. Fenvalerate (Ectrin WDL)—Use 0.1% fenvalerate pour-on made by mixing 1 quart of fenvalerate 10% water dispersible liquid in 25 gallons of water, or 2 ounces in 1.5 gallons. Use about 2 ounces of a wetting agent such as liquid Joy® or Ivory® per 5 gallons of pour-on. Apply 4 ounces per animal by pouring on the top of head and down the backline. Repeat in 14 days if required.
4. Ivermectin (Ivomec)—Inject ready-to-use sterile solution containing 1% ivermectin, 40% glycerol formal, and propylene glycol q.s. ad 100%. This is formulated to deliver the recommended dose level of 300 mcg/kg given subcutaneously in the neck at the rate of 1 ml (10 mg ivermectin) per 75 lb body weight. Use the Table 1 (hog mange and/or hog lice) as a guide.

Animals should be appropriately restrained to receive safe subcutaneous injection. Use a 16- or 18-gauge needle for sows and boars, and 18- or 20-gauge needles for younger animals. Inject under the

skin, immediately behind the ear. Use sterile equipment and clean the injection site with alcohol before injection. The rubber stopper should also be disinfected with alcohol to prevent contamination of the contents. Louse eggs are unaffected by ivermectin and may still hatch up to three weeks posttreatment; therefore, louse infestations developing from such hatching eggs may require retreatment. IVOMEC INJECTION FOR SWINE IS FOR USE IN SWINE ONLY; MISUSE IN OTHER ANIMAL SPECIES (ESPECIALLY DOGS) MAY RESULT IN FATALITIES.

5. Ronnel (Korlan®)—Use 0.5% ronnel, as a spray or dip, made by mixing 1 gallon 24% ronnel livestock emulsifiable concentrate in 100 gallons of water, or 1.3 ounces in 1 gallon.
6. Ronnel (Korlan®)—Treat bedding with 5% ronnel granules at the rate of 0.5 pound per 100 square feet. This dose rate has been cleared for use on bedding occupied by piglets.

Restrictions: No preslaughter interval is required with coumaphos, dioxathion, or ronnel. DO NOT use dioxathion or ronnel more often than once every two weeks. DO NOT apply fenvalerate within one day of slaughter.

An asterisk () preceding any insecticide means that all or some uses of the product have been restricted by the Environmental Protection Agency. Applicators must be certified before they may purchase restricted products.

House flies

Residual sprays

1. Diazinon—Use 0.5% diazinon, made by mixing 1/4 pound 50% diazinon wettable powder or 1/2 pint 25% diazinon emulsifiable concentrate in 3 gallons of water.
2. Dimethoate (Cygon)—Use 1% dimethoate, made by mixing 1 pint 23.4% dimethoate emulsifiable concentrate in 3 gallons of water.
3. Permethrin—Use 0.1% permethrin, made by mixing 1 cup 5.7% emulsifiable concentrate, or 8 level teaspoons 25% wettable powder in 3 gallons of water.
4. Rabon—Use 1% Rabon, made by mixing 1/2 pound 50% Rabon wettable powder in 3 gallons of water.
5. Ronnel (Korlan)—Use 1% ronnel, made by mixing 1 pound 25% Korlan emulsifiable concentrate in 3 gallons of water.

Restrictions: Do not apply permethrin, Rabon or ronnel residual fly sprays directly onto hogs. Buildings should be aired out until spray is dried. Do not contaminate feed or water. Cover feed and water troughs before spraying with any of these insecticides.

Baits

Recommended ready-to-use dry baits:

1. Dichlorvos (Vapona)—Use a bait containing 0.5% dichlorvos.

2. Malathion—Use a 1% malathion bait.
3. Ronnel (Korlan)—Use a 1% ronnel bait.
4. Trichlorfon (Neguvon)—Use a 1% trichlorfon bait.

Recommended liquid baits—must be prepared by user.

1. Dichlorvos (Vapona)—Use liquid bait containing 0.1% dichlorvos.
2. Malathion—Use a 1% malathion liquid bait.
3. Ronnel (Korlan)—Use 2% ronnel liquid bait.
4. Trichlorfon (Neguvon)—Use a 0.1% trichlorfon liquid bait.

Restrictions: Do not place baits where animals may come in direct contact with the material. Do not contaminate feed or water.

Maggot control

1. Dimethoate (Cygon)—Use 1 pint 23.4% dimethoate emulsifiable concentrate in 2 1/2 gallons of water.
2. Rabon—Use 5 tablespoons 50% Rabon wettable powder in 1 gallon of water.

Restriction: Do not apply where animals may come in contact with the treated manure.

hand. Treat purchased feeder pigs before turning them in with home grown animals, and treat all feeder pigs in the fall.

Demodectic mange is caused by hog follicle mites that live in the hair follicles and oil glands of the skin of the hog. These mites cause hard, round swellings on or just under the surface of the skin. The very small, worm-like mites are microscopic, about 1/100 of an inch in length.

There is no completely satisfactory chemical control for these mites, although the insecticides recommended for the control of the itch mites may aid in controlling follicle mites. Severely infested animals should be killed and destroyed. Less severely infested animals should be marketed for slaughter.

Clean and disinfect hog houses, pens, sheds, etc., in which mangy hogs have been confined before using them for noninfested hogs.

House flies

Wastes that accumulate around swine housing can increase the house fly problem around the farmstead. Those operations where the hogs are confined in small pens or in buildings and where manure is allowed to accumulate have the greatest fly problems. Hogs reared on pasture or in confinement in conjunction with a manure disposal lagoon will not add much to the fly problem.

The essentials of good fly control are 1) following good sanitation practices, 2) using baits and residual sprays to kill adult flies, and 3) using a larvicide spray to kill the maggots before they have a chance to become adult flies.

Good sanitation practices include frequent (at least weekly) cleaning and disposing of bedding, manure and waste feed from inside and around buildings. The material should then be thinly scattered in fields or pastures, away from buildings, so that it will dry and not be attractive for fly breeding. This reduces the number of fly breeding areas and helps to maintain low populations of flies. **If good sanitation practices are followed, less insecticide will be needed and that used will be more effective.**

Residual sprays leave a deposit of insecticide that flies contact when they land on treated surfaces. Residual sprays remain effective for a few days up to several weeks.

Apply the first spray to walls and ceilings in late spring when flies are frequently observed but before they become a problem. This is usually during May.

Repeat applications as needed. Apply 1 gallon of spray per 500 to 1,000 square feet of surface. Use a compressed air sprayer for small areas and a power sprayer for larger areas.

On unfinished wood, brick or concrete surfaces, wettable powder formulations will usually give longer lasting control than emulsifiable concentrates.

Baits consist of a diluted insecticide with an attractant that serves to draw flies to the insecticide. Start baiting buildings as soon as flies begin to be numerous. Place bait where flies congregate during the day—window ledges, doorways, alley-ways, doorway to feed room, areas near standing water in buildings, etc. Baits must not be placed where animals or children can come in contact with them.

Dry baits are commercially available in ready-to-use form. During the first four or five days, scatter the bait heavily enough that it can be seen. Continue to put out bait each day for the next week, but smaller amounts can be used. After the first 10 days, put out fresh bait every two to four days in those places where the most flies were killed during the initial baiting.

Liquid baits have to be prepared by the user. To make a liquid bait, mix the proper amount of insecticide with water and add sugar, corn syrup or molasses. Follow the directions on the container label. Spread the bait on the floor by using a sprinkling can. Where a dirt floor is present or the floor is dirty, apply the bait on pieces of burlap, cardboard, etc. Apply fresh bait every two to four days.

Continue to use bait regularly during the summer. Do not stop as soon as fly numbers are knocked down. If you quit and allow fly numbers to increase, it will be necessary to start all over again with the heavy initial baiting quantities.

Controlling maggots

Make very effort to remove manure accumulations from in and around the buildings. If manure can't be scattered in fields and must be accumulated in piles, use a larvicide spray to help hold down fly breeding until the waste accumulation can be spread in fields. Covering manure piles with black plastic sheeting will reduce fly access.

Apply the insecticide to manure accumulations as a coarse spray or with a sprinkling can. Apply 1 gallon per 100 square feet of surface area, every five to seven days. Flies may continue to lay eggs on the sprayed manure, but the insecticide will prevent most of the maggots from maturing.



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