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### G92-1094 Controlling External Swine Parasites

John B. Campbell

University of Nebraska - Lincoln, [jcampbell1@unl.edu](mailto:jcampbell1@unl.edu)

Barbara Straw

University of Nebraska - Lincoln

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# Controlling External Swine Parasites

Mixing, safety, restrictions, and precautions for insecticides used to control external swine parasites.

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*John B. Campbell, Extension Entomology Specialist  
Barbara Straw, Swine Extension Veterinarian*

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## Hog Lice and Mange Mites

External parasites of swine include the hog louse and two species of mange mites (the common itch mite and the less common hog follicle mite). Excessive scratching and rubbing by pigs nearly always indicate an infestation of hog lice or mange mites.

Hog lice and mange mites infest a high percentage of swine slaughtered at Midwest slaughter plants.

### Hog Louse

The hog louse, although the largest of the domestic animal species of lice, may go undetected because its coloration and that of the pig may blend. It is a blood-feeder both in the immature and adult life stages. The life cycle from egg to adult averages 24 days, but the reproduction rate increases in the winter and declines with warm weather. Lice are spread by animal contact or infested bedding.

Louse infested swine itch, and the resulting scratching causes the skin to become thickened and cracked, resulting in sores. Infested animals are nervous, gain less weight, are less feed-efficient and tend to be more susceptible to diseases than lice-free animals.

## Hog Lice Control

Sprays and powders are most often used for hog louse control (*Table I*). In addition, Tiguvon (fenthion) is a pour-on registered for louse control (1/2 fl oz/100 lbs body weight). The treatment/slaughter interval for Tiguvon is 14 days, and the treatment interval is 14 days.

<b>Table I. Compounds effective for lice control only.</b>		
<b>Compound</b>	<b>Available forms</b>	<b>Precautions or restrictions</b>
<i>Coumaphos</i>	Dusting powder	Do not use on pigs under 3 months of age. Use with caution on pigs between 3 and 6 months of age.
<i>Malathion</i>	Dusting powder Liquid spray concentrate	None
<i>Methoxychlor</i>	Dusting powder Liquid spray concentrate Powdered spray concentrate	None
<i>Permethrin</i>	Aerosol Dusting powder Ready to use spray	Do not contaminate feed or water.
<i>Piperonyl butoxide and pyrethrin</i>	Liquid spray concentrate Ready to use spray	
<i>Pyrethrin</i>	Liquid spray concentrate Ready to use spray	
<i>Rabon</i>	Dusting powder Powdered spray concentrate	None

## Swine Mange Mites

Mange mites are microscopic insects that infect skin. There are several different species of mites that infect a variety of livestock hosts. Each species of mite is host-specific, that is, swine mites (*Sarcoptes suis*) only infect swine and are not able to survive on other animals.

Mange mites burrow in the skin of swine. The burrowing causes intense itching; subsequent scratching (primarily with hind legs) causes lesions (scabs). The lesions may appear anywhere on the body but usually start around the head and then the hind legs. Once scabs are formed, mite production increases rapidly under the scab. Infested skin areas become scruffy, inflamed, raw and cracked. Hair bristles become stiff and upright and hair losses occur--all of which gives an infested animal a rough unkempt appearance. A light infestation may go unnoticed, particularly if it starts in the ears. A positive mange diagnosis can only be made by examining skin scrapings (deep enough to penetrate mite burrows) under magnification because the mites are so small.

Mange infested animals fail to gain properly, are poor feed converters and are more susceptible to diseases. Market hogs may be docked for appearance and reduction in hide value. The mites are spread by animal contact.

## Mange Mite Control

Two methods of mange control are available:

1. Periodic treatment with products that kill adult mites. Usually these are spray type applications such as listed in *Table II*. When the insecticide is applied, it kills adult mites on the pig. Eggs are not killed by the insecticide. Eggs will hatch out in about 10 days and begin to grow into adults. Treatment is usually repeated at a 2-3 week interval to kill the newly hatched mites before they can mature and start to lay more eggs. Treatment is never 100 percent successful because many mites are burrowed deep under the pig's skin where the insecticide cannot penetrate. Frequency of treatment will be determined by severity of infection and ease of application. Inadequate mange control with spray-on products can occur if there is poor timing of successive applications. Another shortcoming is not thoroughly spraying the entire pig, especially inside the ears, the belly, and inside the legs. A high pressure sprayer should be used because of the tendency of hair to shed water. With a low pressure spray, the insecticide may just run off the pig and not reach the skin and the mites.
2. "Permanent" elimination of mange mites. Ivermectin administered by injection kills both adults and immature forms. Strategic use of ivermectin as outlined below can rid a herd of mange so that subsequent treatments are not necessary.

<b>Compound</b>	<b>Precautions or restrictions</b>
<i>Amitraz</i>	Approved for use on pigs of all ages including baby pigs and lactating sows. Do not treat within 1 day of slaughter.
<i>Fenvalerate</i>	Do not treat within 1 day of slaughter.
<i>Lindane</i>	Use is restricted in various states. Do not treat sick pigs or pigs under 3 months of age. Do not treat 2 weeks prior to or 3 weeks after farrowing. Do not treat within 60 days of slaughter.
<i>Malathion</i>	Do not treat sick pigs or pigs under 1 month of age. Keep pigs out of sun and wind a few hours after spraying. No withdrawal.
<i>Permethrin</i>	Do not treat within 5 days of slaughter.
<i>Phosmet</i>	Do not treat within 1 day of slaughter. Do not use in combination with cholinesterase inhibiting drugs. Do not treat sick pigs or pigs under 3 months of age.

## Eradication of Mange

Mange mites can survive off the pig only for about 3 days. After a pig is given an injection of ivermectin, the drug stays in the pig's body at high levels for 1 week. If the mange mites stay on the pig they will die, and if they leave, they will die. Although ivermectin is deadly to mites, they do not die immediately after being exposed to it. Live mites can be found on treated pigs for about 3 days after injection with ivermectin. During this time if the infected, treated pig comes into contact with an uninfected pig, the infection will spread.

Eradication of mange is accomplished by injecting each pig on the farm with ivermectin, so that no mange mites survive on the pigs. All pigs must be injected on the same day. If half the pigs are treated one week and the other half are treated the following week, infection may spread from the second half of the pigs back to the first half. It is extremely critical that each pig receives the proper dose of ivermectin. If even one pig is left untreated, it can reinfest the entire herd. Improper dosing may occur if 1) pig weights are estimated rather than measured on a scale, 2) drug runs back out of the injection site, or if 3) care is not taken to accurately mark each pig as it is treated. Piglets that are born within 5 days after the

herd is treated must also be given injections of ivermectin. Otherwise these unprotected piglets could be infected by mites from their dam.

Eradication is usually performed in the summer because 1) off-pig survival time of mange mites is somewhat shorter in hot weather than in cooler weather, 2) warmer weather is more conducive to proper handling and administration of ivermectin, and 3) if the finishing building is partially empty, there will not be a problem with pipes freezing. Because treatment with ivermectin is fairly expensive (about a penny a pound) it is common to move the heavier finishing pigs off the farm before treating the herd. Also there is an 18-day withdrawal period. Extra finishing space may be rented, or if the eradication is planned well in advance, a group of pigs may be sold as feeders, and the eradication planned for the time that those pigs would have reached market weight.

Because there is great potential for not carrying out all steps of the eradication, many producers choose to repeat the entire process one month after the first treatment of the entire herd.

Possibly a third technique for mange control is spot treatment with ivermectin. This is mostly used by farrow-to-finish producers who lack the resources to eradicate mange and who find it difficult to use spray-on applications especially in the winter. Sows are injected about 2 weeks before they farrow. At the time of farrowing, sows are relatively free of infection. Their piglets start life free of mange and as long as they are kept isolated from older pigs, they will remain uninfected.

## **Flies**

House flies and, to a lesser extent, stable flies are often found in large numbers at swine facilities. Both fly species have been implicated in the transmission of hog cholera and other diseases.

The first step in controlling a fly problem is sanitation. Manure may accumulate in shelters and around feeders for pigs in lots and should be removed at 10-day intervals to avoid fly breeding problems.

Confined swine housing systems sometimes create fly breeding problems when manure drops through slatted floors of the housing and is allowed to accumulate under the housing. If manure is allowed to crust at the surface, house flies will breed in the pit.

Chemicals, if used in combination with sanitation and on a regular basis, can give good fly control. Without sanitation, chemical controls may fail.

## **Chemical Treatment of Breeding Areas**

Generally, applying insecticides to fly breeding areas is not practical. The insecticide breaks down rapidly in the acid medium of the manure and insect resistance to an insecticide can build rapidly with this type of treatment.

Lime can be used as a fly larvicide. Use enough lime to cover all pit material. Make sure no lime remains on the floor because of danger of skin burns on the pigs and possible feed or water contamination. Liming should be done at weekly intervals.

## **Residual Sprays**

Residual insecticides (*Table III*) can be applied to fly resting areas in and around the swine housing. Flies absorb enough insecticide while resting to kill them.

Apply the spray to the point of run-off, but do not allow it to puddle. Make sure food, water and animals are not contaminated.

<b>Table III. Materials that can be used as residual sprays.</b>	
<b>Insecticide</b>	<b>Mixture<sup>a,b</sup></b>
<i>Dimethoate</i>	2 qts 43.5% EC to 25 gals water.
<i>Fenthion (Baytex)</i>	4 oz 46% EC or 1 to 1 2/3 fl oz 93% LC to 1 gal water.
<i>Fenvalerate (Ectrin)</i>	1/2 qt 10% EC to 10 gals water.
<i>Malathion</i>	1 pt 57% EC to 7 gals water.
<i>Methoxychlor<sup>c</sup></i>	4 qts 25% EC or 4 lbs 50% WP to 25 gals water.
<i>Permethrin (Ectiban)</i>	1 qt 5.7% EC to 25 gals water.
<i>Rabon</i>	4 lbs 50% WP to 25 gals water.
<sup>a</sup> Cover surface but do not allow to runoff. <sup>b</sup> EC = emulsifiable concentrate; LC = liquid concentrate; WP = wettable powder. <sup>c</sup> House flies may be or become resistant to methoxychlor.	

### Area Sprays

Apply area sprays (*Table IV*) in and around buildings wherever flies congregate. Area sprays must contact the fly to be effective. These sprays can be applied by mist blowers, hydraulic sprays and fogging devices. Adjust hydraulic sprays to deliver a fine mist. Use foggers only when the wind will allow the fog to drift slowly through the fly infested area. If confined housing units have little ventilation, move animals out prior to spraying in the building.

<b>Table IV. Materials that can be used as area sprays.</b>		
<b>Insecticide<sup>a</sup></b>	<b>Equipment</b>	<b>Mixture and Rate<sup>b</sup></b>
<i>Dichlorvos (Vapona DDVP)</i>	Mist blower	1 gal 40.2% EC to 96 gals water. Apply 0.2 lb/acre (5 gals 0.5% spray)
<i>Fenvalerate (Ectrin)</i>	Mist blower	1 qt 10% EC to 10 gals water. Apply 5 gals/acre.
<i>Naled (Dibrom 8)</i>	Mist blower, Hydraulic sprayer	3 to 5 qts 58% EC to 100 gals water. Apply about 5 gals/acre, not to exceed 0.2 lb actual/acre.
<i>Naled (Dibrom 14)</i>	Fogger	Dilute 1 gal in 99 gals No. 2 diesel fuel or fuel oil. Apply 40 gals spray mix at 5 MPH with 300 to 400-foot swath.
<i>Permethrin (Ectiban)</i>	Mist blower	1 qt 5.7% EC in 12.5 gals No. 2 diesel fuel or fuel oil. Apply 5 gals/acre.
<sup>a</sup> Read label for use restrictions, mixture procedures and safety precautions. Some mixtures of insecticide are registered (example: Ciovapo = Ciodridn + Vapona). <sup>b</sup> EC = emulsifiable concentrate; LC = liquid concentrate.		

### Baits

Fly baits (*Table V*) are effective only on house flies. They will help if used in conjunction with one or more of the methods previously discussed. Distribute dry baits along walls, fences or other areas where flies congregate, but locate baits where pigs cannot feed on them.



**Table V. Materials that can be used as fly baits.**

<b>Insecticide</b>	<b>Formulation</b>	<b>Amount</b>
<i>Malathion</i>	3.5% dry	Sprinkle daily where flies congregate.
<i>Methomyl (Apache)</i>	1.0% methomyl	Sprinkle where flies congregate.
	2.0% Triocolure	
	(pheromone attractant)	
<i>Naled (Dibrom)</i>	1.25% liquid	
	0.5% dry	
	0.5% liquid	
<i>Trichlorfon (Dipterex)</i>	1.0% dry	4 oz/1000 sq ft.
	2.0% liquid	2 oz/1000 sq ft.
	1.0% liquid	Spot treatment with brush or spray.

**Feed Additives**

Rabon (stirofos) has been registered as a swine feed additive for fly control. The product is 7.6% Rabon and is added to feed at a rate of 1.3 lbs/ton of feed for growing and finishing animals weighing less than 200 lbs and 2.6 lbs/ton of feed for mature animals weighing over 200 lbs.

- Read and follow label directions for mixing, safety, restrictions and precautions when using any of the insecticides mentioned in this publication.
- Insect control suggestions in this guide are based on University of Nebraska research results, U.S. Department of Agriculture recommendations and Environmental Program Agency label registrations.

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