



Cooperative Extension Service • Michigan State University

External Parasite Control on Swine

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External parasitism is a continuing problem for pork producers. Estimates of annual losses to lice and mange infestations range from \$10 million to \$50 million. Lice and mange mites can also mechanically transmit diseases such as swine pox and eperythrozoonosis. The major problems are caused by hog lice, *Haemotopinus suis*, and mange mites, *Sarcoptes scabiei* and *Demodex phylloides*.

Life Cycle of Hog Lice

Hog lice (Figs. 1 and 2) are bloodsucking parasites that feed exclusively on swine. They are large ($\frac{1}{4}$ in. long) insects that cling to the hair of the neck, behind the ears, and in the folds of the skin. They can survive for 2 to 3 days off the pig in warm bedding, but they will not generally live on other animals. The life cycle of lice takes

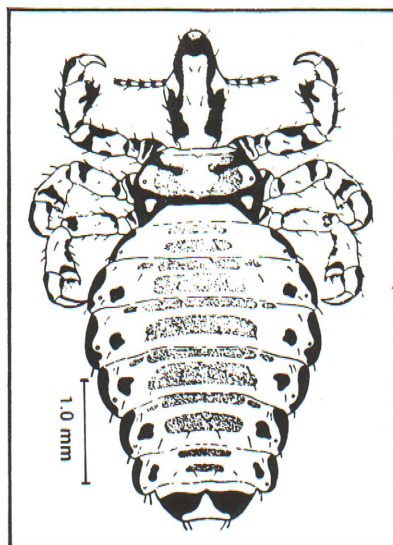


Figure 1, left. The hog louse is a bluish-black pest, about $\frac{1}{4}$ in. long. It is readily observed on the necks of infested pigs. (From Whitehead, 1942. Used by permission from *Diseases of Swine*, 4th ed., ed. by Howard W. Dunne and Allen D. Leman, 1975, by the Iowa State University Press, Ames, Iowa 50010.)

Figure 2, right. Lice may feed in clumps, generally on the more tender areas of the skin.

about 25 to 30 days to complete from adult-egg-adult. The adult life span is about 35 days. An adult female will lay 3 or 4 eggs daily for approximately 25 days. These eggs are attached to the hair shaft and hatch as nymphs (immature forms) in 7 to 20 days. Nymphs are similar in structure but smaller than the adult. The nymphs will go through three developmental stages before reaching adulthood. During development, lice may feed in clumps, generally on the more tender areas of the skin. Lice infestations start around the ear, expand to the lower body, and then to soft-skinned abdominal areas. Lice do not burrow into the skin at any stage of their life cycle.

Symptoms

Mild lice infestations may cause no clinical problems. In more extensive infestations, the pests can be seen as dark bluish-black discolorations on the skin. The continuous sucking of blood and lymph causes irritation to the skin, leading to some itching. Damage from lice is primarily irritation, making the hogs restless and decreasing feed intake and growth rate in growing-finishing pigs. In addition, anemia may occur in young pigs because of the blood loss. Also, lice can carry swine pox virus, *Eperythrozoon suis*, and other diseases to susceptible pigs.

Life Cycle of Mange Mites

Two types of mange mites affect swine. *Sarcoptes scabiei* var. *suis*, the most common, burrow into the upper two-thirds of the skin. Their life cycle takes as little as 8 to 17 days to complete. New females, as they mature, mate close to the skin surface and then begin new tunnels for their young (Fig. 3). This is the only external exposure during the life cycle. The adult female lays 1 to 3 eggs daily for about 14 days. In 3 to 5 days these eggs hatch in tunnels, maturing to adults in 5 days. The female dies about 30 days after reaching maturity.

Initially, an infestation begins on the inner side of the ear and spreads over the head, along the neck and then across the body. The affected skin has small raised areas

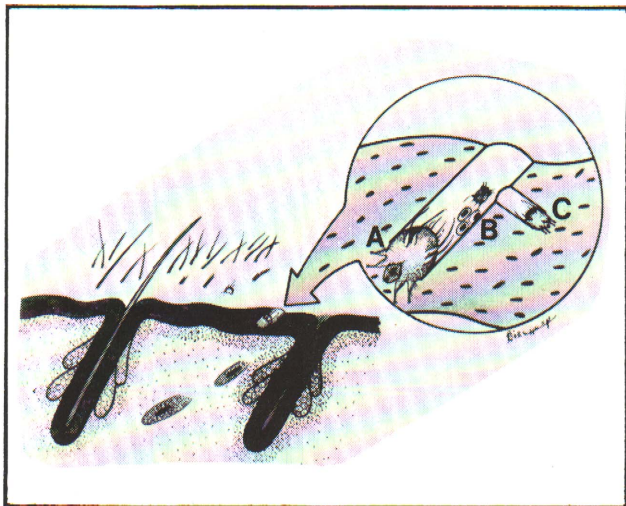


Figure 3. The life cycle for the sarcoptic mite, which is completed in the skin. The adult (A) lays eggs (B), which develop into immature nymph stages (C).

covered with brownish scabs. This is followed by hyperkeratosis—thickened, rough skin (Fig. 4). An intense itching may accompany the infestation, although in mild infestations itching may be negligible. The activity of the mites increases as skin is warmed by fever or high environmental temperature. This increases the irritation and feeding rates and may intensify the itching in affected pigs. Probably the highest mite activity is found during the summer but creates less of a problem for producers because of less contact spread and better control ability. High winter populations probably reflect the difficulty of treatment during cold weather and more contact spread.

Infestations by *Demodex phylloides* are uncommon in swine. These mites live in the hair follicles and produce a pimple-like lesion. The complete life cycle is not known, but the mites require about 3 weeks to develop through three larval stages to the adult. Adults will live for 1 to 2 months. Initially, an infestation begins around the nose and eyelids, then moves to the abdomen and inner thigh areas. No serious pruritus (itching) or other clinical problem is involved with this parasite. Occasionally, the pimples become infected and an abscess develops.

Transmission

Species of mange mites and hog lice described above infest only swine. These pests are not carried on other animals, so pig-to-pig contact is the major means of transmission. Hog lice and sarcoptic mites can live in warm bedding for several days under ideal conditions before attaching to a new host. Occasionally, this will result in uninfested animals being infected without direct animal contact. However, primary transmission is by direct contact with infested pigs. Demodectic mites are very susceptible to drying and low temperatures and will live only a day or two away from the host.

Treatment

Successful treatment of lice and mange is a difficult assignment because it requires a complete break in the

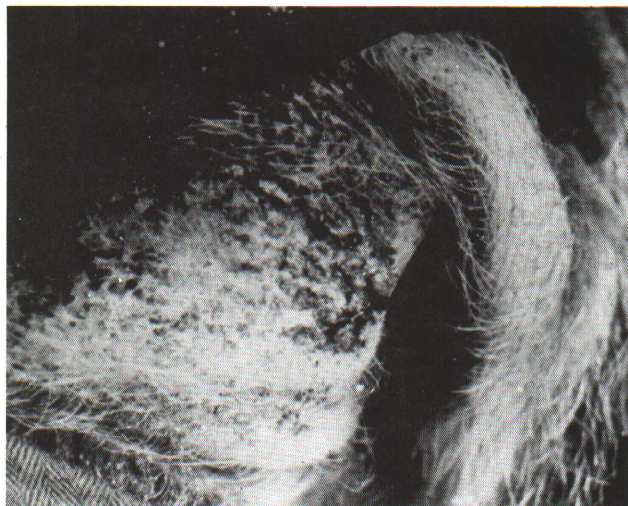


Figure 4. Closeup view of *Sarcoptes*-infested outer ear showing thickened skin with scab formation.

parasite's life cycle. Because of the greater susceptibility of baby pigs to lice and mange problems and the higher toxicity of many chemicals to pigs under weaning age, the sow becomes a focal point for pest control measures.

Sows should be routinely sprayed for mange control 45 days prior to farrowing. An additional spraying at 30 to 35 days pre-farrowing also might be needed for satisfactory control. Use of lindane immediately before farrowing may cause baby pig problems because small residues of lindane on the udder can kill suckling pigs. Sows treated within a week of farrowing should have the udder washed prior to farrowing. Mange mites, because of their habit of burrowing deep into the skin and the tissue debris which results, are protected from many surface-applied products. High-pressure spraying (100-250 psi) is required, particularly around the head and neck, to force insecticide into the tunnels and to cover the animal completely with 2 to 4 qt. of finished spray. A nonfoaming detergent (0.25 lb. per 25 gal. spray) may be added to the spray to enhance coverage. Eradication of sarcoptic mites is extremely difficult under field conditions; however, routine spraying or dipping will keep the parasite in check.

A successful sow control program should be followed by a maintenance spray program for growing-finishing pigs. Animals about 8 weeks of age should be sprayed or dipped with an approved insecticide. A followup treatment in 2 weeks is recommended for better control. Additional applications can be made as required to market weight, if withdrawal restrictions are followed.

If the sow pest control program has not been followed, mange infestations in suckling pigs can be reduced by applying an insecticide approved for use on baby pigs. When pigs are more than 8 weeks old, the control program listed above must be followed.

Successful lice control can be accomplished with all the products labeled for mange control. Additionally, CoRal®, Ciodrin®, Ciovap®, methoxychlor, Rabon®, and Tactic® sprays; Tiguvon® pour-on; and Co-Ral®, malathion, Pro-late® and Rabon® dusts have been used successfully for lice control. Use of dusts on bedding in conjunction with spray application might make lice treatments more effective. Several insecticides are available for direct use on suckling pigs and gestating and lactating sows for lice control. However, this treatment of suckling pigs is not routinely needed if a successful sow lice control program is carried out. No known treatment for demodectic mites is available. Infected animals should be removed from the herd to minimize further transmission.

Weather Influences

During severely cold weather, pour-on treatments or dust applications can be used for lice control. Small portable, low-volume misting applicators may also be used for lice control. Insecticides are prepared in an oil or water base and a small quantity (4 to 6 oz. per animal) applied. Because of the smaller volume, fewer problems of chilling are encountered during cold weather application. However, conventional spray applications for mange or lice control can be accomplished during winter months by selecting sunny, calm days when temperatures are above freezing.

Table I lists currently labeled products found successful in external parasite control. Approved products and their use concentrations may change periodically. You are encouraged to read and follow the product container label to ensure safe and effective treatment.

Withdrawal periods must be carefully observed because of the residue-producing potentials of these chemicals. Read the label for information on withdrawal times, proper product usage, and application rates. Do not over-treat animals with any insecticides.

Mange Eradication

The approval of ivermectin injectable has introduced a new dimension to external parasite control, because spraying or dipping swine in an insecticide solution is no longer required to kill external parasites. At the 300 mcg/kg body weight level, extended (6 months) Sarcoptic mange mite control has been demonstrated, but at lower levels much shorter control periods have been achieved. The product maintains activity for 8 to 10 days after injection and, therefore, may be effective in killing emerging immature forms. Persistence of effective ivermectin blood levels has led veterinarians to attempt to eradicate mange and lice. Mange mites can be eradicated under specific conditions. Because of the high treatment expense and the difficulty in completely breaking the mite's life cycle, development of a comprehensive eradication program should follow veterinary consultation. Meticulous implementation of the program is required because leaving a single pig untreated at any stage of this plan can cause the eradication effort to fail. Steps to consider include:

1. Reduce the breeding herd numbers through a rigorous culling program prior to eradication initiation.
2. Attempt only in the summer months.
3. Remove all bedding and spray the premises with an approved spray from Table I at the time all animals are injected.
4. Inject all animals on the farm within a 1- to 2-day time period with 300 mcg/kg body weight of Ivermectin. *All swine must be treated* including lactating sows and breeding boars. Suckling pigs should be treated 2 or more days before placement in the nursery. Inject all replacement stock during the isolation period with 300 mcg/kg body weight of Ivermectin and leave in isolation for 7 days before adding to the herd.

Although following a comprehensive program as outlined above may result in eradication of mange from a herd, no guarantees can be given. An additional degree of effectiveness may be provided by retreating all swine on the farm 10 to 14 days after the initial injections. Although it doubles the expense and labor, retreatment will provide longer therapeutic levels and a great margin of safety.

Because external parasites are so difficult to control, eradication of mange may not be possible under normal farm conditions. Therefore, swine mange eradication should be attempted only after a careful cost-benefit evaluation.

Reference to products in this publication is not intended to be an endorsement to the exclusion of others which may be similar. Persons using such products assume responsibility for their use in accordance with current directions of the manufacturer.

Table 1. External parasite control products.*

Compound	Usage Guide	Sarcoptes	Lice	Withdrawal times (days)	Special instructions
amitraz Taktic®	Mix 1 qt/50 gal water	x	x	1	Restricted use. Repeat treatment 7 to 10 days later.
fenthion Tiguvon® 3% pour-on	½ fl. oz/100 lb body weight		x	14	May be used on gestating and lactating sows.
fenvalerate Purina Mange and Lice Control Ectrin® 10% E.C.	Mix 1 qt/50 gal water	x	x	1	Repeat in 14 days.
lindane 20% E.C.†	Mix 1 pt/50 gal water	x	x	30	Do not treat pigs less than 3 months old. Do not treat gestating and lactating sows.
lindane 12.4% E.C.†	Mix 1½ pt/50 gal water	x	x	30	
malathion 4-5% dust	¼-½ tsp/head	partial	x	0	Do not treat pigs less than 1 month old.
malathion 57% E.C.	Mix 2 qt/50 gal water	x	x	0	
methoxychlor 23.8% E.C.	Mix 1 gal/50 gal water		x	0	Repeat in 14-21 days.
methoxychlor 50% W.P.	Mix 4 lb/50 gal water		x	0	
permethrin Atroban® 11% E.C.	Mix 1 pt/50 gal water	x	x	5	Repeat in 14 days.
Ectiban® 5.7% E.C.	Mix 1 qt/25 gal water	x	x	5	
phosmet Prolate® 11.6% E.C.	Mix 2 qt/50 gal water	x	x	1	Do not treat pigs less than 3 months old.
Prolate® 1% dust	½-1 oz/head		x	1	
stirofos Rabon® 50% W.P.	Mix 4 lb/50 gal water		x	0	Repeat in 14 days.
Rabon® 3% dust	3-4 oz/head		x	0	
ivermectin 1% Ivomec®	300 mcg/kg (1cc/75 lb)	x	x	18	

*There are no known treatments available for Demodex infections in swine.

This table represents general usage and withdrawal information as presented on current labels. Label changes can occur at any time. Before using any pesticide, read and follow label directions. Specific formulations may have longer withdrawal times.

The amended Federal Insecticide, Fungicide and Rodenticide Act of 1974 requires that all pesticides be classified for general or restricted use. Producers purchasing or using restricted-use pesticides after October 21, 1977, must become certified or additional state regulations may limit use of certain pesticides. Check with your state Extension specialists for certification or use requirements and for the specific latest control recommendations.

†Lindane is a restricted-use pesticide. Do not use benzene hexachloride (BHC) in making this formulation.

W.P. = wettable powder; E.C. = emulsifiable concentrate; W.D.L. = water dispersable liquid.

Pesticides must be registered with the U.S. Environmental Protection Agency and the Michigan Department of Agriculture before they can be used legally in Michigan. This bulletin suggests using pesticides to manage external parasites of swine. Purchase only those pesticide products that are labeled for external treatment of swine and the pest/parasite you wish to control. Remember that the pesticide label is a legal document on pesticide use. Read the label carefully and closely follow all instructions and limitations. The use of a pesticide in a manner not consistent with the label can lead to the injury and death of treated animals and could harm humans, other animals, and the surrounding environment. Misuse of pesticides can also lead to civil or criminal prosecution and illegal residues in the tissues of treated animals. Pesticides are a good management tool to control pests, but only when they are used in an effective, economical, and environmentally sound manner.



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Issued in furtherance of Cooperative Extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W.J. Moline, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.

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PESTICIDE EMERGENCY INFORMATION



(Please post in an appropriate place)

For any type of emergency involving a pesticide, the following Emergency Information Centers should be contacted immediately for assistance. This Cooperative Extension Service Bulletin is the latest information available as of July 1987, and replaces all previous listings of similar information.

HUMAN PESTICIDE POISONING

Eastern Half of Michigan

within the Detroit City proper

***(313) 745-5711**

within the 313 area code

***(800) 462-6642**

statewide

***(800) 572-1655**

*Poison Control Center
Children's Hospital of Michigan
3901 Beaubien
Detroit, MI 48201*

Western Half of Michigan

within the Grand Rapids City proper

***(616) 774-7854**

within the 616 area code

***(800) 442-4571**

statewide

***(800) 632-2727**

*Blodgett Regional Poison Center
Blodgett Memorial Medical Center
1840 Wealthy, S.E.
Grand Rapids, MI 46506*

Upper Peninsula of Michigan

within the Marquette City proper

***(906) 225-3497**

Upper Peninsula only

***(800) 562-9781**

*U.P. Poison Control Center
Marquette General Hospital
420 West Magnetic Street
Marquette, MI 48955*

SPECIAL PESTICIDE EMERGENCIES

Animal Poisoning

Your Personal Veterinarian

() -

and/or

Animal Health Diagnostic Laboratory
Michigan State University

(517) 353-1683

Pesticide Fire

Local Fire Department

() -

and

Fire Marshal Division, Michigan State Police
(Local authorities will assist in contacting the State Fire Marshal)

Traffic Accident

Local Police Department or Sheriff's Department

() -

and

Motor Carrier Division, Michigan State Police

() -

Environmental Pollution

Pollution Emergency Alerting System (PEAS)
Michigan Department of Natural Resources

***(800) 292-4706**

Pesticide Use Incident

Pesticides & Plant Pest Management Division
Michigan Department of Agriculture

(517) 373-1087

*** Telephone Number Operated 24 Hours**