

# RABON FOR HOG LOUSE<sup>1</sup> CONTROL IN FLORIDA<sup>2,3</sup>

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## ABSTRACT

Effective control of the hog louse *Haematopinus suis* (L.), winter populations was achieved with Rabon [2-chloro-1-(2, 4, 5-tri=chlorophenyl) vinyl dimethyl phosphate] WP and EC at 0.25, 0.35 and 0.50%, and lindane 0.06% EC. Rabon 3% dust was less effective. Rabon WDS at 0.25% gave near 100% control of summer louse populations. No detectable residues (at 0.02 ppm<sup>c</sup> sensitivity level) of Rabon or its metabolite SD 13462 were found in tissue of animals treated with Rabon.

The hog louse, *Haematopinus suis* (L.), is an important ectoparasite on swine in Florida. Louse populations start increasing rapidly in late October and remain as egg producing populations into June. Louse economic damage to swine is caused by lowered weight gain (Johnson 1961). High louse populations on swine are usually seen in the winter; however, off season or over-summering lice maintain breeding numbers for the fall increases.

The loss of previously effective control measures and the need to develop reduced dosage rates of safe, suitable compounds for livestock is a continual one (Graham and Harris 1966). Insecticide control of hog lice was achieved by other workers with ground treatments of ronnel and dimethoate (McGregor and Grey 1963, Johnson 1961) and on-animal treatments of malathion (Johnson 1958), chlorfenvinphos, carbaryl, crotoxyphos, methoxychlor, and Dilan (Roberts 1965). Current Florida recommendations are given by Strayer and Butler (1972).

Rabon<sup>TM</sup> residue analysis of treated animals was evaluated under Texas conditions (Ivey et al. 1971). Some unexplainable residues were seen under their conditions, making it necessary to evaluate Rabon on swine in Florida.

An experiment was designed to evaluate the effectiveness of Rabon [2-chloro-1-(2, 4, 5-tri=chlorophenyl) vinyl dimethyl phosphate] at several dosage levels and formulations to determine its value in hog louse control as compared to lindane and untreated checks.

## METHODS AND MATERIALS

Winter hog louse treatments were made on 9 infested herds containing 172 animals. Two treatments were made at about 2 week intervals. Animals used were from 3 locations in Suwannee County, Florida. Animal sex and size varied with location.

Pretreatment counts were made on the day of or day before treatment. Posttreatment I counts were made prior to the second treatment. Posttreat-

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ment II counts were taken 12-14 days after the last treatment. Individual animals were held for counting or counted while standing. One half of the animal was examined for lice with a distinction made between adult, nymph, and egg stages. The final count was doubled to account for the complete animal. With very high populations, lice were counted only up to 100.

Summer louse experiments were in Alachua County, Florida. Rabon water dispersable spray (WDS) as a 0.25% spray was tested under Florida summer conditions. Winter treatment spray concentrations and formulations used were Rabon emulsifiable concentrate (EC) and wettable powder (WP) at 0.25, 0.35, and 0.50%; Rabon 3% dust; and lindane EC 0.06%. A Bean<sup>TM</sup> hydraulic sprayer, was used to apply 0.9-1.8 liters of spray per animal at 7.03 kg/cm<sup>2</sup>, wetting the animal to run off of material. Individual animal replications were used in each treatment. Analysis of 5 hog louse counts was made on winter treatments and 8 on summer treatments. Analysis of variance and partition of the degrees of freedom were used to determine differences between treatments and check.

Swine tissue was taken for residue analysis. Shoats (45.36 kg-81.65 kg) were treated with a 0.5% Rabon EC (240 g/liter EC) spray to complete coverage and wetness on 2/6/69 and 2/18/69 for a total of two applications. These shoats were slaughtered on 2/19, 2/21, or 2/25/69, and samples of muscle, liver, kidney, renal fat, subcutaneous fat, and omental fat taken for analysis. Analyses were made in cooperation with Shell Chemical Co. according to their method PMS-G-905A/68 at Shell Chemical Company, Agricultural Chemicals Division, Pesticide Laboratory, Princeton, New Jersey.

#### RESULTS AND DISCUSSION

Winter hog louse treatments of Rabon at 0.25%, 0.35% and 0.5% as both WP and EC gave 100% control of *H. suis* ( $p < .01$ ) with 2 applications 15 days apart (Table 1). The lindane EC 0.06% spray treated group had 1 animal with nymphs present on the final count, but no significant differences were shown between lindane and the Rabon EC or WP. Rabon 3% dust had all louse stages present on the final count but at significantly ( $p < .01$ ) reduced levels. Louse control with Rabon 3% dust was not effective.

Summer hog louse populations on the check herd (Table 2) indicated that populations continue reproduction, with nymphs and eggs present throughout June and July. Numbers of lice do decrease during late July. Two insecticide treatments at intervals of 17 days gave complete removal ( $p < .05$ ) of *H. suis* on all replications except for 1 animal (Table 2). This louse may have been transferred by contact from an untreated check animal as the herds were separated only by a fence. Summer as well as winter treatments seem to require 2 treatments at 2 week intervals for effective control.

Residue analyses of samples taken from animals treated with Rabon 0.5% EC are given in Table 3. No residues exceeded the sensitivity of the test (0.02 ppm) in any of the tissue samples or time periods after treatment of either Rabon or its breakdown product SD 13462.

The low dosage levels of 0.25% EC, WP, or WDS were effective in controlling summer and winter lice and should be the dosage level of choice under Florida conditions. Rabon WP and EC and lindane 0.06% EC were more effective than Rabon 3% dust. No detectable residues were found in animals

TABLE 1. HOG LOUSE CONTROL FOR WINTER TREATMENTS.

No. Animals	Treatment	Average Number of Lice per Animal*		
		Precount 2/5-6/69	Post Treat. Count I 2/20-21/69	Post Treat. Count II 3/6/69
25	Rabon 0.25% WP	90 ena**	68.8 n	0.0
30	Rabon 0.35% WP	80 ena	34.0 n	0.0
10	Rabon 0.50% WP	100 ena	29.0 n	0.0
50	Rabon 0.25% EC	100 ena	92.8 n	0.0
10	Rabon 0.35% EC	94 ena	3.0 n	0.0
10	Rabon 0.5% EC	100 ena	5.2 n	0.0
10	Lindane 0.06% EC	100 ena	20.4 n	5.6 ena
11	Rabon 3% Dust	90 ena	55.4 ena	20.0 ena
16	Untreated Check	100 ena	100 ena	100 ena

\* Lice were counted only up to 100 per animal on 5 animals selected at random from each herd.

\*\*e—eggs noted but not included in count

n—nymphs present in total count

a—adults present in total count

TABLE 2. HOG LOUSE CONTROL WITH RABON FOR SUMMER TREATMENTS.

No. Animals	Treatment	Replication	Average Number of Lice per Animal					
			Precount 6-23-71	Post Treatment I 7-9-71		Post Treatment II 7-19-71		
			Adult and Nymph	Adult	Nymph	Eggs	Adult	Nymph Eggs
10	Untreated check	1	8.6	9.4	14.6	22.0	3.4	3.6 28.8
3	Untreated check	2	44.0	14.6	2.6	0	1.2	13.2 0
8	Untreated check	3	3.6	5.2	16.4	0	3.4	0 0
11	Rabon 0.25% WDS	1	6.6	6.4	55.0	0.4	0	0 0
15	Rabon 0.25% WDS	2	9.2	0.6	2.8	0	0.1	0 0
4	Rabon 0.25% WDS	3	37.0	0	23.5	0	0	0 0

TABLE 3. RESIDUES OF RABON IN THE BODY TISSUES \*, \*\* OF HOGS AS RABON AND SD 13462 AFTER 2 TREATMENTS OF 0.5% EC.

Sample	Replication	Day After Last Treatment	ppm					
			Omental Fat	Subcutaneous Fat	Renal Fat	Liver	Kidney	Muscle
Sample check								
Rabon†	1	—						
SD 13462†	1	—						
1-34-4	1	1	0.084	0.075	0.100	0.12	0.12	0.05
2-34-4	2	1	0.081	0.070	0.097	0.12	0.12	0.05
check								
animal	1	—	0	0	0	0	0	0
1-33-11	1	3	0	0	0	0	0	0
2-33-11	2	3	0	0	0	0	0	0
check								
animal	1	—	0	0	0	0	0	0
1-33-5*	1	7	0	0	0	0	0	0
2-33-5**	2	7	0	0	0	0	0	0
check								
animal	1	—	0	0	0	0	0	0

\* not corrected for percent recovery

\*\*O represents residues of 0.02 ppm concentration sensitivity range of the test

† 0.1 ppm were added to portions of untreated hog tissue before extraction and analysis were performed to check the analytical method.

treated with Rabon 0.5% EC in contrast to residues in animals at 1 day posttreatment shown by Ivey et al. (1971).

These data indicate that Rabon is a safe and effective insecticide for louse control on swine in Florida.

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