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EXPERIMENTAL RESULTS OF CHLOROPHACINONE GROUND SPRAYS
IN NORTH CAROLINA

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ABSTRACT: Field experiments with chlorophacinone (CPN) ground sprays seem to be more effective in control of pine voles in North Carolina orchards when the percentage grass cover under tree drip lines is high. Preliminary laboratory results seem to confirm this observation.

Our group has carried out a number of field trials of the efficacy of ground sprays for controlling pine voles in orchards. In reviewing these tests with special reference to inconsistency of results with chlorophacinone (Hayne 1977) an apparent relationship to the amount of grass cover was noted, and laboratory trials were started to test this question.

METHODS: The field experiments were carried out in privately-owned orchards in Henderson County, N.C. Each experimental plot of about 2.0 acres contained a central data area and a buffer zone; the basic design was described by Sullivan and Hayne (1978).

Vole activity was monitored before and after treatment by live trapping and the apple sign test. Blood coagulation times were also recorded but are not reported here. Toxic ground spray was applied by using an angular boom that distributed the material evenly from the tree trunk out to the drip line. An operating pressure of 125 to 135 psi was used; this is lower than recommended but we feel that using this lower pressure reduces drift and keeps most of the toxicant under the tree. The application rate was varied in a study of this factor.

Laboratory tests were carried out in metal boxes using methods described by Davis et al. (1980) with the difference that in some boxes sod with a vigorous growth of grass was used instead of bare soil. In one set of boxes containing sod we added a measured amount of water to simulate rainfall (325 ml/day with 12 animals, 700 ml/day with 10).

RESULTS: Table 1 shows the results of the field tests. The higher the percentage ground cover, the more effective the apparent control. The laboratory results (Table 2) are consistent in that at the same application level, mortality seemed to be higher with sod. Use of simulated rainfall seemed to have little effect on the outcome.

DISCUSSION: These results indicate that chlorophacinone ground spray is most effective in the presence of vegetational ground cover, in this case, grass. Horsfall et al. (1974) observed that the ingestion of this lethal agent by mice may be enhanced by the presence of forbs in the treated greenery. Both observations are consistent with the label advice not to spray bare ground. At present we conclude that where there is little or no vegetation under the trees, chlorophacinone ground spray may not be expected to provide good control of voles.

There may be need to look at other ground sprays under these same conditions.

Table 1. Field trials of chlorophacinone ground spray listed in order of amount of grass cover.

Application per sprayed acre			Grass		Percent activity apple sign test		Number of voles live-trapped		
			percent cover	mean height in	pre	post	pre- treatment marked	post- treatment marked	unmarked
gal	lb	ai							
682	0.34		98	9	62	0	39	13*	14*
652	0.33		98	6	70	0	23	0	0
681	0.34		95	7	30	0	17	0	2
555	0.28		90	8	8	0	5	0	1
500	0.25		75	6	79	29	4	1	16
577	0.29		70	6½	38	29	9	1	7
624	0.20		35	6	54	42	97	53	15
693	0.35		10	5	33	33	6	0	3

To qualify for inclusion in this table the test must have had either 4 animals marked and released before treatment or 10 percent active stations with the apple sign test.

*Caught in first 48 hours after spraying; no capture after 72 hours.

Table 2. Laboratory tests of toxicity to pine voles of chlorophacinone applied to bare soil and to sod.

cover	Treatment		Number of voles (died/total)	
	lb ai per acre		treated	control
Bare soil	0.2		2/16	0/6
	0.4		4/4	0/2
Sod, no water	0.2		12/12	0/2
	1.2		19/22	0/4

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