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VOLE CONTROL WITH VOLAK RODENTICIDE

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ABSTRACT

Field trials with VOLAK rodenticide containing 50 ppm brodifacoum have been conducted in eight states and against four vole species during 1977-78. Hand baiting at 5-10 lb/A and broadcast applications at 10-20 lb/A gave more effective control than other products tested in most cases.

INTRODUCTION

Preliminary information concerning the toxicity of brodifacoum and the acceptance of VOLAK to voles in the lab, and preliminary field results of the 50 ppm pelletized VOLAK formulation became available in 1976. This was largely through the efforts of Dr. Ross Byers of Virginia. Since that time, ICI has endeavored to enlist the aid of other researchers to evaluate VOLAK as well as creating an internal field staff to conduct additional VOLAK trials in several states.

During 1977-78, both handbaiting and broadcast applications were conducted against various *Microtus* species, especially pine and meadow voles. Methods were generally those of Byers (Hortscience 10:391, 1975) involving the use of cut apple census bait before and after treatment to determine the percent reduction in activity. Live trap censusing was also attempted in some locations but this method did not appear suitable for general use because of trap-induced mortalities and difficulties in trapping in the post-treatment census in areas which had subsequently experienced severe cold and snow.

SUMMARY OF DATA

As a general summary, the following two tables list partial results of both handbait and broadcast trials with VOLAK by species and state, and in comparison with other products tested at the same time. Several additional trials were conducted but data has not yet been fully summarized.

The range of percent control expressed for some trials indicates apple activity reductions expressed both with and without adjustment for natural activity declines as seen in some control plots. For hand-baiting, all bait was applied under shingles or other covers at one or more sites per tree. For broadcast baiting, bait was applied to under-tree acreage by hand or machine spreading. All sites were dormant apple orchards unless otherwise noted.

Table 1

Results of VOLAK Handbait Trials, 1977-78

Species	Rate (lb/A)	State	Investigator	Plots/Trt.	Results*
Pine Vole	10	VA	Byers	3	97% BFC vs. 90% CPN, 83% BDN, 45% DPN, handbait at same rates, 3% 787 at 5 lb/A.
"	7.8	VA	Byers	3	85-100% BFC place packs vs. Control
"	5	WV	ICI/Whiteman	3	Equal to or better than CPN and ZN_3 PZ at 10 lb/A handbait
"	5	VA	Byers	3	86-98% BFC vs. 73-86% DPN, 68-81% CPN; both handbait at 10 lb/A
"	5	VA	Byers	3	70-92% BFC vs. 64-84% DPN handbait at 20 lb/A
Meadow Vole	12	IL	Byers	1	BFC 88-100% vs. 54-87% CPN, 77-89% DPN; handbait at same rates
"	5	MI	Howitt	1	57-98% overall control (no comparison)
"	5	WA	ICI/Volker	1	48% BFC vs. 55% CPN at 10 lb/A
Prairie Vole (pears)	5	IL	Klimstra	2	42-100% BFC vs. 42-100% ZN_3 PZ

Table 2

Results of VOLAK Broadcast Trials

Species	Rate (lb/A)	State	Investigator	Plots/Trt.	Results*
Pine Vole	25	VA	Byers	3	70-92% BFC vs. 78-100% CPN broadcasted at 22 lb/A
"	19	VA	Byers	3	65-99% BFC vs. 60-95% CPN at 23 lb/A, 53-87% BDN at 15 lb/A 39-73% DPN at 20 lb/A, all broadcast
"	15	VA	Byers	3	74-82% BFC vs. 6-14% BDN, 32-40% CPN, broadcast at same rates.
"	11.3	VA	Byers	3	72-87% control (No comparison)
Meadow Vole	27	IN	Byers	5-6	68-80% BFC vs. 70-82% CPN, 76-88% DPN; both broadcast at same rates
"	10	WA	Britt	3	56% BFC vs. 17% DPN, 1% CPN; broadcast same rates
"	10	WA	Barber	2	95% control (No comparison)
"	10	WA	ICI/Volker	3	48% BFC vs. 23% DPN at same rate
Prairie Vole	20	IL	Klimstra	2	27-80% BFC vs. 33-87% Z_3 PZ at same rate rate
Oregon Vole (pear)	10	OR	Barber	3	50-80% BFC vs. 50-80% DPN at same rate

* BFC = Brodifacoum (VOLAK)
BDN = Bromadiolone (MAKI/BROMONE)
DPN = Diphacinone (RAMIK)
CPN = Chlorophacinone (ROZOL)
ZN_3 P_2 = Zinc phosphide (eg. BONIDE and other baits)
787 = Pyriminyl (VACOR/DLP-787)

Because of variations in regional climate, orchard conditions and other variables, the above trials are not strictly comparable but some general trends in the data can be seen. Instances of apparent low control in some trials may be due to census techniques used, possibly insufficient bait points, or insufficient time for voles to become accustomed to covered feeding points. However, as all plots were treated similarly, the relative efficacy between compounds can still be judged.

Against pine voles, VOLAK applied as hand bait in Virginia/West Virginia equaled or exceeded similar applications of Zn_3P_2, CPN, BDN, DPN and 787 in in reduction of activity even when, as in the case of CPN and DPN, these other compounds were applied at twice the rate of BFC. As little as 5 lb/A handbait of VOLAK (BFC) appeared to effectively control pine mice. In handbait trials in Illinois against meadow voles, VOLAK was just slightly superior to CPN and DPN at the same rates and in a Washington trial, only slight less effective as CPN at twice the rate.

In three broadcast trials in Virginia against pine mice, VOLAK averaged 1.3 times better in reducing activity than chlorophacinone at similar rates and an average of 3.6 times better than Diphacinone also at similar rates, in two trials. Results of VOLAK broadcast efficacy trials against meadow voles suggest superiority to CPN and DPN. For example, in three trials, BFC was an average of 2.2 times better than DFC at the same rate in reducing activity.

Conclusions

It is concluded that VOLAK (BFC) efficacy to voles is such that successful control (over 80%) appears to be generally achieved with up to 1/2 the applied amounts of other products with comparable efficacy. Because of the potential hazards of anticoagulants such as DPN, CPN, BDN, and BFC to certain non-target organisms, (eg. dogs and birds) the ability to reduce effective rates represents a significant reduction in this potential hazard while cutting material costs.

Handbaiting with VOLAK appears to present the most effective way to minimize toxicant required for effective control, with 5 lb/A proving successful for some species. VOLAK handbaiting, as with all orchard rodenticides, should involve covering bait placements with shingles or other covers to stimulate vole feeding and to reduce potential hazard to non-target animals.

Initial work suggests a combination of VOLAK 50 gram placepacks covered by a concrete tile or tire section may provide optimum utilization of VOLAK for several reasons:

1. It provides protection for bait. Bait in placepacks, if packs are unopened or bait not entirely consumed, may remain palatable for weeks or even into the next season and thus prevent reinvasion or buildups from breeding.

2. Hazard of orchard rodenticide is reduced as larger animals generally cannot successfully dislodge the heavier covers.

3. Grower labor is reduced as the tire or concrete covers may be considered permanent and need not be removed from year to year, only lifted and additional bait packs added as necessary.

4. Human hazard and misuse of bait are reduced as bait is kept in a sealed and labeled package throughout the application. Predetermined effective rates can be easily followed by noting number of packs applied without need for weighing out or apportioning bait, which can create errors in application.

5. When bait covers are placed out several weeks prior to baiting, they become a focal point of vole activity and allow bait subsequently applied to come into contact with a large percentage of the resident vole population, eliminating need for voles to forage above ground for a lethal dose as for broadcasted baits.

Field trials with VOLAK through efforts of independent researchers and an enlarged ICI field staff will continue with a variety of orchard regions and conditions in 1979-80 under an extended experimental permit. Interested researchers who wish to evaluate VOLAK should contact ICI concerning testing protocols and availability of bait. This testing program is an effort to secure sufficient data for a national VOLAK orchard label for Microtus. Prior experience in registering the commensal rodenticide TALON (also containing brodifacoum) suggests that the toxicology and environmental data requirements of the EPA for any rodenticide represent a greater obstacle to obtaining registration than that of verifying efficacy. These non-efficacy requirements are being actively pursued by ICI and it is hoped that the combined work of ICI and independent researchers will accomplish registration and make VOLAK available to growers in the not too distant future. VOLAK will provide an additional tool to help them combat the vole problem which so severely affects apple production in many areas.