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RODENTICIDE EVALUATION IN THE HUDSON VALLEY DURING 1980 & 81

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The objective of Cornell University's research program is to develop a successful integrated system to control pine and meadow vole damage in the apple orchards of the Hudson Valley. This is being accomplished by determining the effect of habitat manipulation and rodenticides on vole populations. We are also doing research to quantify the amount of damage apple trees sustain from various densities of pine voles. By coupling the results of these two avenues of research, we hope to provide growers with a cost-effective pest management plan. Efficacy of Chlorophacinone (Chempar, Inc.) and Brodificoum (ICI Americas, Inc.) in various populations and treatments were evaluated in 1980 and 1980 (Table 1).

Table 1. Candidate rodenticides field tested during 1980 and 1981.

Rodenticide	Application	Rate
Chlorophacinone (Chempar Inc.)		
Rozol Groundspray	Postharvest	@ 6 pints/A
" "	Postharvest	@ 4 pints/A
" "	Pre-harvest	@ 6 pints/A
Rozol Pellets	Handbait	@ 10 lbs/A
Brodificoum (ICI Americas)		
Volak Pellets	Handbait	@ 10 lbs/A
Volid Pellets	Handbait	@ 5 lbs/A
" "	Broadcast	@ 10 lbs/A

Methods

Field testing of the candidate rodenticides was conducted in Ulster Co., New York during December 1980 and August through December in 1981. The test sites were located in the towns of New Paltz, Clintondale, Highland, and Modena. Treatment and corresponding control plots were situated within the same orchard block with similar soil, ground vegetation, tree variety and spacing. Each plot was buffered on all sides with adjacent rows of same treatment or physical barriers. Orchards were trapped and indexed at least once prior to treatment to determine initial population levels and pine/meadow vole ratios. Plots were selected with high pine vole populations wherever possible. Post-treatment activity levels were monitored again with the apple-slice index usually at one, two, four, and six weeks. Treatment activity is presented relative to control activity to reduce the amount of change in vole activity due to seasonal or weather patterns. This is accomplished by dividing the treatment activity by control activity.

Results and Discussion

Rozol ground spray (chlorophacinone) was applied postharvest with a handgun sprayer at the rate of 4 pts/acre (Fig. 1). There was some reduction in vole activity in three of the trials. Activity in the fourth trial was virtually unchanged throughout the test period. Increasing the concentration of Rozol to 6 pts/acre and applying with an airblast sprayer yielded good reduction in orchards with high initial activity (Fig. 2). There appeared to be little effect on plots with low pre-treatment activity. A post-harvest application at 6 pts/acre in 1981 achieved substantial reduction in vole activity (Fig. 3). Results of a "pre-harvest" application are shown in Figure 4. In actuality, it was a post-harvest application on early apple varieties that were picked a month or more ahead of the major crop. One plot exhibited very good reduction of vole activity, two trials had moderately effective results and the fourth was ineffective at maintaining vole activity at reduced levels. The latter treatment was in a recently abandoned crabapple orchard with taller ground cover vegetation and high numbers of pine voles. These circumstances could cause fewer voles to be killed and a rapid reinvasion to occur.

Fig. 1. ROZOL GROUNDSPRAY: POST-HARVEST APPLICATION WITH HANDGUN SPRAYER ON 8 DECEMBER 1980; 4 PINTS/ACRE (HUDSON VALLEY, N.Y.).

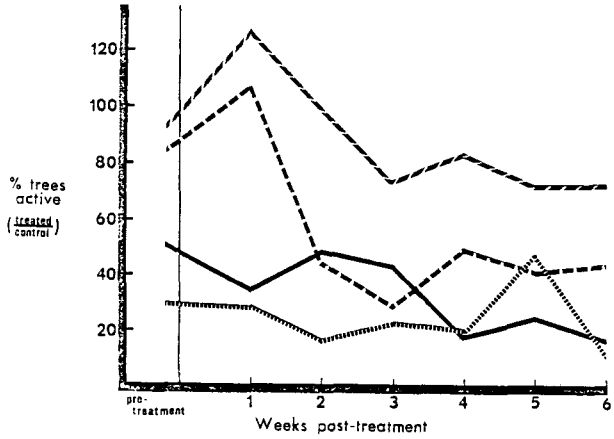


Fig. 2. ROZOL GROUNDSPRAY: POST-HARVEST APPLICATION WITH AIRBLAST SPRAYER ON 8 DECEMBER 1980; 6 PINTS/ACRE (HUDSON VALLEY, N.Y.).

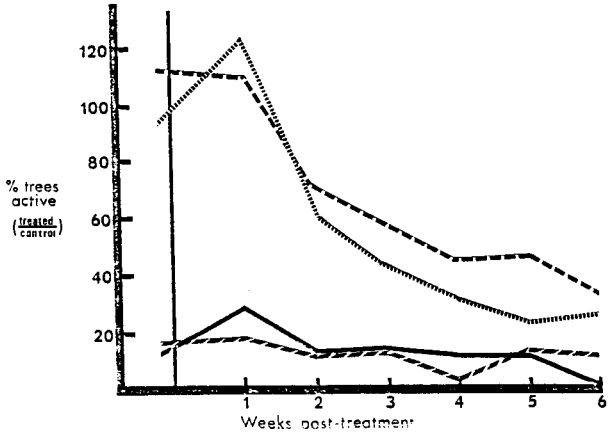


Fig. 3. ROZOL GROUNDSPRAY: POST-HARVEST APPLICATION ON 31 NOVEMBER 1981; 6 PINTS/ACRE (HUDSON VALLEY, N.Y.).

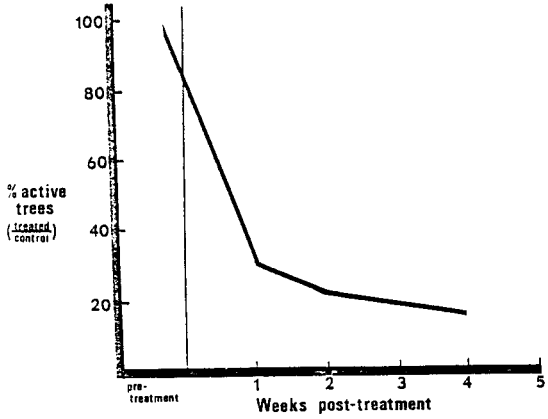
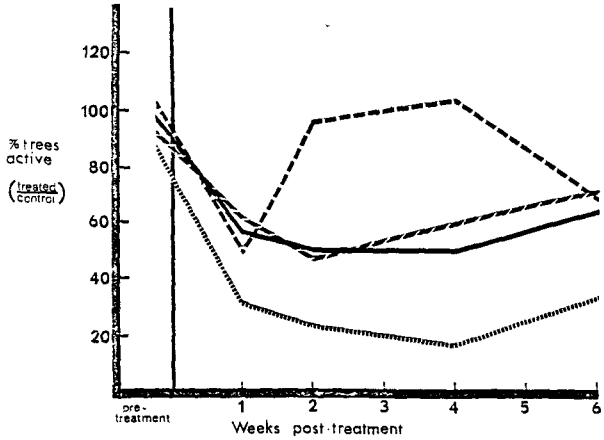


Fig. 4. ROZOL GROUNDSPRAY; PRE-HARVEST APPLICATION ON 28 AUGUST 1981; 6 PINTS/ACRE (HUDSON VALLEY, N.Y.).



Chlorophacinone was also tested in a pelletized preparation. Figure 5 shows the results from handbaiting with the pellets in December 1980 at 10 lbs/acre. Substantial reduction of vole activity was achieved in both trials. The same preparation was applied in October 1981 with mixed results (Fig. 6). One application gave effective control, the other two applications were ineffective. Bait was readily removed by voles in all three of these trials. The conflicting results could be explained by the possible inadvertant use of an inactive batch of Rozol pellets. We suggest this possibility although we cannot confirm or deny it. This is one of the few times that Rozol pellets have failed to effect a good control.

Fig. 5. ROZOL PELLETS; HANDBAIT APPLICATION ON 18 DECEMBER 1980; 10 LB/ACRE (HUDSON VALLEY, N.Y.).

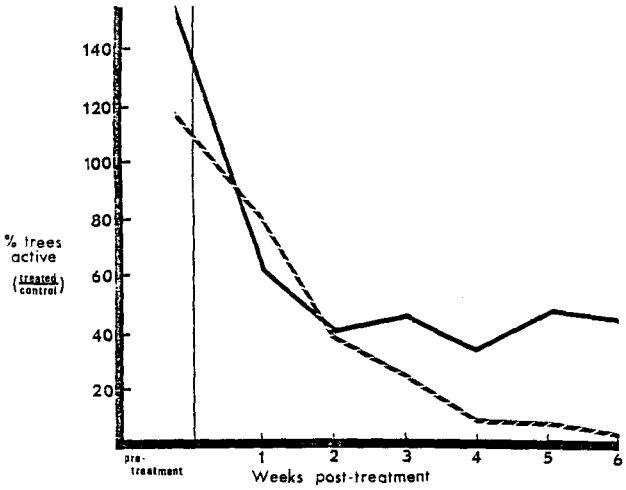
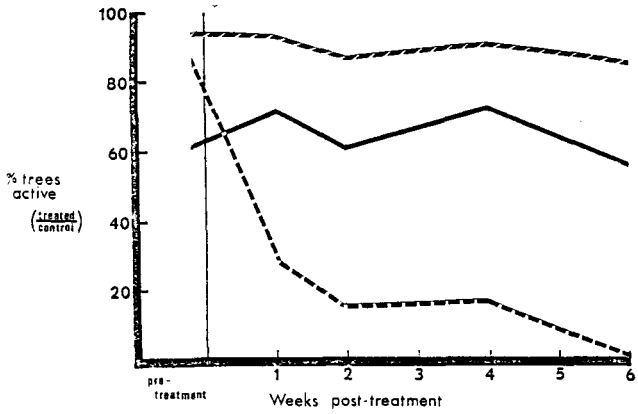


Fig. 6. ROZOL PELLETS; HANDBAIT APPLICATION ON 29 OCTOBER 1981; 10 LB/ACRE (HUDSON VALLEY, N.Y.).



Brodificoum is a "second generation" anticoagulant (March et al. 1980) that was tested in two preparations, Volak and Volid pellets. Volak, used at 10 lbs/acre under bait stations, produced excellent results in both trials (Fig. 7). Volid exhibited similar results in two of the trials (Fig. 8) and moderate control in the third. Volid was also tried in a broadcast application at 10 lbs/acre (Fig. 9). Activity levels were reduced in all three plots, but in only one did the population approach the desirable level of reduction.

Fig. 7. VOLAK PELLETS; HANDBAIT APPLICATION ON 7 NOVEMBER 1981; 10 LB/ACRE (HUDSON VALLEY, N.Y.).

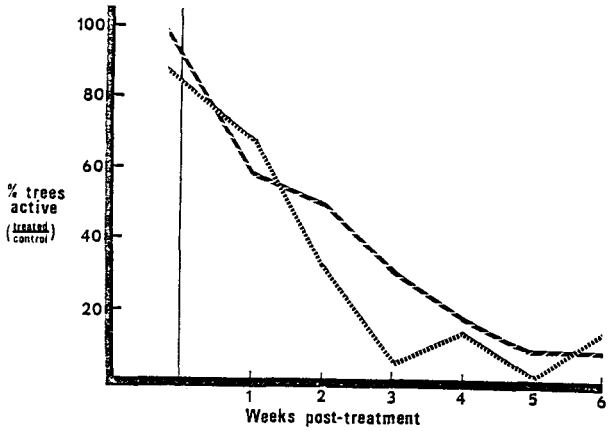


Fig. 8. VOLID PELLETS: HANDBAIT APPLICATION ON 7 NOVEMBER 1981; 5 LB/ACRE (HUDSON VALLEY, N.Y.).

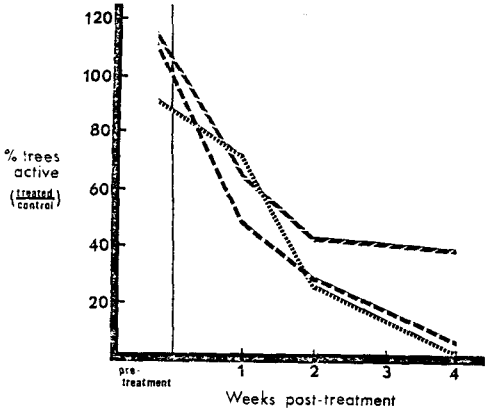
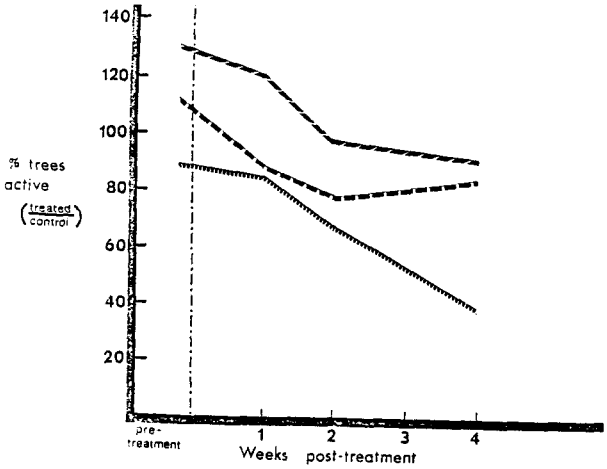


Fig. 9. VOLID PELLETS: BROADCAST APPLICATION ON 7 NOVEMBER 1981; 10 LB/ACRE (HUDSON VALLEY, N.Y.).



Handbaiting of rodenticides still yields the most dependable results. Meanwhile, post-harvest broadcast applications have frequently been ineffective or produced non-predictable results in the Hudson Valley. Abundant food resources during the time of our broadcast testing could reduce bait acceptability. During late winter and early spring food resources and vole body fat are at the lowest levels of the year (Cengel et al. 1978), and this may be a better time to achieve results with broadcast baits. In addition, pine vole tunnels are often exposed as the snow cover melts and broadcast baits are more likely to fall in the right place. We will be testing a spring application prior to spring green up, in hopes of achieving predictably effective control of voles with a broadcast treatment.