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Potential Repellents for Reducing Canada Goose Depredations

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North American Canada goose (*Branta canadensis*) populations are increasing. For example, the Mississippi flyway reported a 148% increase in the number of Canada geese during mid-December surveys from 1980 to 1989. While increasing populations are an important positive step in the conservation of waterfowl, it is also true that Canada geese are now frequently implicated in habitat destruction, crop depredation, and nuisance problems. Management of damage caused by these birds usually involves the use of pyrotechnic devices, traps, and mechanical scare devices. However, the uses of these techniques is often limited by cost, logistics, and/or effectiveness. These limitations have stimulated efforts toward the development of effective, economical and environmentally safe chemical repellents to deter damage caused by geese.

We conducted 5 separate experiments to evaluate the repellency of methyl anthranilate (MA) and DRC-156 to geese within a 40 x 120 m enclosure at the Denver Wildlife Research Center (DWRC), Denver, CO, from August to December 1989. They included the following: Experiment 1: MA formulation 1 applied at 5 kg/ha; Experiment 2: MA formulation 1 applied at 9 kg/ha; Experiment 3: MA formulation 2 applied at 9 kg/ha; Experiment 4: DRC-156 applied at 16 kg/ha; and Experiment 5: geese from Experiment 4 were removed and new geese were introduced onto units used in that experiment. The enclosure was divided equally into six units, within each unit, two 14 x 14 m grass plots were established. The number of units used for each experiment varied from 2 to 3. We only re-used units if grass plots were replaced, the plots showed no signs of chemical residues or geese showed no preference for either plot. Six geese were released into each unit and allowed to acclimate for 10 days. Geese were evaluated over 10 to 20 day posttreatment period. We sprayed each plot chosen for treatment with MA or DRC-156 1 time at its assigned application rate with a boom type sprayer. Repellent effectiveness was determined by bird observations and goose feces counts.

In Experiment 1, for both bird numbers and fecal deposits there were no significant differences between treatments ($P = 0.61$ and 0.82), respectively. In Experiment 2, for bird numbers there were no significant differences between treatments ($P = 0.06$), however, there were significant differences between treatments for fecal deposits ($P = 0.02$). In Experiment 3, for bird numbers there were no significant differences between treatments ($P = 0.19$). However, for fecal deposits there were significant differences between treatments ($P = 0.05$). In Experiment 4, for both bird numbers and fecal deposits there were significant differences between treatments ($P < 0.01$ and 0.04), respectively. Finally, in Experiment 5, for both bird numbers and fecal deposits there were significant differences between treatments ($P < 0.01$ and 0.02), respectively.

Although both chemicals repelled geese at respective application rates, 9 kg/ha for MA and 16 kg/ha for DRC-156, DRC-156 appeared to offer much better repellency for a longer period of time. At these application rates, chemicals are comparable in cost, MA ($7/kg) and DRC-156 ($4/kg). Indications are that the application rate of DRC-156 could possibly be lowered to one third the tested rate and still show repellency. Thus, there would be a distinct economical advantage of developing DRC-156 as a goose grazing repellent. The current application cost of DRC-156 would be about $60/ha, an amount that turf managers would be willing to spend on a goose grazing repellent.