

POTENTIAL FOR AVERSIVE CONDITIONING IN FOREST ANIMAL DAMAGE CONTROL

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ABSTRACT

Mountain beavers (Aplodontia rufa) and black-tailed deer (Odocoileus hemionus columbianus) are two of the main wildlife species causing damage to forest seedlings. The use of repellent chemicals is often limited because there are problems in timing applications to coincide with periods of damage, particularly by deer. Mountain beavers have shown little response to repellents applied by conventional methods; their damage to seedlings has therefore appeared difficult to control with repellents.

In limited pen tests, classic electrical shock aversion to treated vegetation has been shown in deer, but no practical shocking method has been developed for field use. In addition, certain native plants such as nonpoisonous wild ginger (Asarum caudatum) and poisonous foxglove (Digitalis purpurea) contain chemical repellents which quickly condition most animals against further consumption of those plants. These and other examples indicated that aversive conditioning or training may be of value in protecting forest crops.

Recently, pen tests indicated that conditioning mountain beavers with putrescent egg-treated Douglas-fir (Pseudotsuga menziesii) foliage led to avoidance of treated Douglas-fir seedlings and that the aromatics of putrescent egg appeared to be much more repellent to deer than previously assumed. It has been found in other studies that avoidance responses in mammals may last for days or years. We determined that similar avoidance is possible to develop in mountain beaver and black-tailed deer.

Our pen tests led to field studies using putrescent egg-treated Douglas-fir cuttings placed in mountain beaver burrows to condition them against cutting subsequently planted Douglas-fir seedlings. In addition, deer tests were established using treated materials attached to seedlings to allow association and avoidance of simple objects such as treated plastic ribbon. To date, these studies have shown that aversive conditioning significantly reduces damage and that the conditioning can be retained by these forest mammals for considerable time periods, perhaps up to a year. Results are being prepared for publication and more extensive studies are being installed to help define the best application methods.

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In limited pen tests, classic electrical shock aversion to treated vegetation has been shown in deer, but no practical shocking method has been developed for field use. In addition, certain native plants such as nonpoisonous wild ginger (*Asarum canadense*) and poisonous foxglove (*Digitalis purpurea*) contain chemical repellents which quickly condition most animals against further consumption of those plants. These and other examples indicated that aversive conditioning or training may be of value in protecting forest crops.

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