Direct Seeding

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Controlling Wildlife Damage in Direct Seeding Systems

Wild animals invade crops to fulfill needs such as food and protective cover. Converting a field from conventional tillage to direct seeding changes the habitat characteristics of the field. In particular, a direct seeded field has much less mechanical disturbance of the soil and usually provides plant cover – a growing crop or crop residue – all year. Although limited research has been done on this topic, these changes likely affect the level of some types of wildlife damage.

Common Nuisance Species

Rodents

In Alberta, the most common animal pests in crop land are the following:

- Richardson' ground squirrels (also called gophers or prairie gophers),
- pocket gophers (also called moles), and
- voles (also called field mice).

Damage caused by these burrowing rodents is usually far more detrimental to crops, soil stability and general land management than that caused by birds or grazing animals like deer.

Burrowing rodents are often permanent residents of land where a particular crop is grown. Their population densities and the damage they cause can vary greatly, depending on the size and type of crop (if any), and the numbers of nearby rodents. Usually the greatest concern is the indirect damage burrowing rodents cause including: damaged harvesting equipment, increased weed growth, and reduced crop yields. Ground squirrels are also a major food source for badgers which can damage fields when digging for ground squirrels. However, badger damage is not a widespread concern because badgers are not widespread.

Birds

Birds that cause problems in agricultural lands are the European starling, several blackbird species and migratory waterfowl. Birds tend to attack cereal crops because these crops provide a pre-migratory, seasonal or short-term source of food. Birds can cause severe damage in localized areas.

Wild ungulates

Wild ungulates, like deer and elk, can also cause serious crop damage in localized areas, but damage is not widespread.

Direct Seeding Effects on Wildlife Damage

Rodents

Burrowing rodents need subsurface tunnels and above-ground corridors for nesting, escape and food gathering to survive and multiply. They cannot tolerate mechanized disturbance, particularly deep cultivation or continuous surface activity. Therefore rodent damage can be greater in direct seeding, zero tillage and chemical fallow systems because of the reduced mechanized disturbance.

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If reduced tillage fallow, chemical fallow or forage production is coupled with poor weed control, rodent populations can be very high. In particular, Richardson's ground squirrels thrive on marginal plant cover and do very well in weedy fallow fields or thin forage stands

Some rodents may actually have beneficial effects on crop production in direct seeded fields. For example, researchers at the University of Guelph have found that mice and small insects eat most of the weed seeds in zero tillage fields because the seeds are left exposed on the soil surface.

Birds

Limited research indicates that crop damage caused by birds is not strongly influenced by the tillage system. Most bird damage occurs when there is little difference between direct seeded and conventional tillage fields: black bird damage usually occurs while the crop is standing and waterfowl damage occurs when the grain is in swaths.

Waterfowl damage does not depend on the type of tillage system. Rather, it depends strongly on weather conditions: waterfowl damage increases markedly when harvest is delayed by poor weather.

Several publications on bird control are available from Alberta Agriculture, including *Preventing Bird Damage to Prairie Crops* (Agdex 685-4).

Wild ungulates

Damage from deer, elk and other wild ungulates does not appear to be strongly influenced by the tillage system used in the field.

Controlling Burrowing Rodent Damage

Historically, farmers controlled burrowing rodent damage by killing rodents with poisons, traps, fumigants and other "on-farm" inventions. More recently, repellents and other non-toxic methods have been tried without much success.

Control methods and strategies are the same in direct seeded and conventional tillage fields. There are several publications on rodent control available from Alberta Agriculture including *The Richardson Ground Squirrel (Prairie Gopher): Its Importance and Control* (Agdex 684), *Control of Pocket Gophers and Ground Squirrels* (Agdex 684-1), and *Mice and Their Control* (Agdex 683).

Ground squirrels are able to rapidly invade an area. Thus it is critical to apply control measures as soon as ground squirrels are seen in a field. Although pocket gophers and mice are slower to invade, early control measures will keep their population levels down.

Poisons

Acute poisons such as strychnine alkaloid and zinc phosphide have long been used to reduce rodent numbers. Both are currently registered for controlling pocket gophers and ground squirrels. As well, anticoagulant poisons, such as chlorophacinone and diphacinone, are now registered for both species.

Most of these food poison baits are available in ready-to-use (RTU) formulations and are simply offered to the rodents according to the label instructions.

Pocket gophers can be poisoned with poison bait delivered into their burrow system either by a specially designed probe applicator or an artificial burrow building device. Some research indicates that fall baiting is more effective than spring baiting. However, control of pocket gophers with poisons varies from poor to fair. Consistent, long-term control will only be achieved when more is known about pocket gopher biology and feeding behaviour.

Traps

Ground squirrel and mouse damage can usually be controlled with poisons but, at present, trapping seems to be the only long-term solution for pocket gopher control. Specially designed hand-set traps for pocket gophers can be very effective under some conditions.

The traps work well because of the unique behaviour of pocket gophers to plug openings in their burrow systems. When the trap is set in an opened burrow system, the pocket gopher is easily trapped when it attempts to plug the opening. Traps are recommended where gopher numbers are few (less than 100) and the infested area is small (less than 20 hectares). Because of the costs and labour involved, traps are not suited to heavy infestations or large areas.

Other practices

Control perennial, tap-rooted, broad-leaved weeds, such a dandelions, thistles and clovers, in the crop and in nearby uncultivated areas for better pocket gopher control. Pocket gophers prefer broad-leaved plants because they cannot get enough energy from grasses alone to produce young.

Control weeds on chemical fallow and reduced tillage fallow for better ground squirrel control.

Build nesting platforms for hawks and other birds of prey that eat rodents. Contact your local Alberta Fish and Wildlife Office for more information on attracting birds of prey.

More Information

Contact your district crop specialist or agricultural fieldman for more information on controlling wildlife damage to your crops.

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Factsheets in the Direct Seeding Series are also available through Alberta Agriculture's Internet site at *http://www.agric.gov.ab.ca/agdex/500/index.html*

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