

## **Federal Research Partnership Results In a More Eco-friendly Approach to Controlling Grasshoppers**

Farming in Western Canada has been regularly plagued by grasshopper infestations, often resulting in economic hardship. The traditional approach to controlling these pests has been to use chemical insecticides. During the most recent infestation in 1986, over 170,000 litres were applied in Alberta alone.

Although any chemicals applied to agricultural lands must be registered and fully tested for safety, any broad-scale application is likely to result in some undesirable impact to non-target (harmless or beneficial) organisms through: the food chain; chemical residues left on crops; drift of the spray to lands or water bodies outside the target area; or exposure to the toxic effects of the chemical.

While liquid spray mixtures of chemical insecticides are the primary means of control, bran-bait formulations (bran particles infused with insecticides or other control agents) appear to be effective in controlling grasshoppers in a more environmentally favourable way. This is because the bran-bait approach:

- reduces by 95 per cent the amount of chemical necessary to achieve effective control
- virtually eliminates residues on crops
- significantly reduces wind-assisted spray drift.

Because the bran particle is eaten by the target insect, the risk to non-target populations is decreased, with the exception of those insects that eat grasshoppers. To confirm that bran-bait formulations represent an environmentally superior alternative to conventional spraying methods, the impacts of bran-bait control had to be determined.

Through an inter-departmental working partnership, Dr. Dan Johnson of Agriculture Canada in Lethbridge and Dr. Bruce Thompson of Environment Canada in Edmonton embarked on a two-year study to determine the extent of the non-target impact. This study component was also part of a bran-bait evaluation as a means of controlling grasshoppers, which was partially funded by the Alberta Agriculture Research Council under its "Farming for the Future" program.

The research concludes that when applied at rates effective in controlling grasshoppers, two of the three bran-baits tested had minimal or undetectable impacts on fish, field mice, adult and larval beetles and leafcutter bees. When conventional and bran formulations were compared, the conventional formulation caused significantly greater mortality to non-target organisms than the bran-bait formulation. Complementary studies by Agriculture Canada showed that bran-baits are effective in controlling grasshoppers, particularly if used on a regular basis to prevent outbreaks.

Bran-baits appear to represent an alternative to conventional spray applications against grasshoppers. This approach is effective and reduces the amount of toxic chemicals in the environment, a goal of the federal government's Green Plan. Agriculture Canada and

provincial agriculture departments are promoting the use of bran-bait formulations as an effective and more environmentally sound means of controlling grasshoppers.

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