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Shift in flea beetle species composition



KEY PRACTICE: Crucifer and striped flea beetles react differently to their environment and to seed treatments. It is important to monitor emerging canola seedlings to know what you're up against.

PROJECT TITLE, LEAD RESEARCHER: "Potential flea beetles species composition shift in Prairie canola," 2007-12, Juliana Soroka, Agriculture and Agri-Food Canada (AAFC) Saskatoon

GROWER ORGANIZATION FUNDER: ACPC, MCGA, SaskCanola

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Flea beetles are chronically the most economically damaging insect pests of canola. Although the crucifer flea beetle remains the predominant species, this study shows the striped flea beetle to be expanding its range across Western Canada. As these two species respond very differently to their environment, spring scouting is critical to planning proper control strategies.

Crucifer flea beetle (*P. cruciferae*) is most frequently found in the southern Prairies while striped flea beetle (*P. striolata*) is traditionally found in the Parkland Region of the northern Prairies and the Peace River Region of Alberta. A third species, the hop flea beetle, occurs across the Prairies in low numbers

along with several other flea beetle species of minor importance to canola.

This five-year Prairie-wide study was conducted to determine the number and distribution of the most common flea beetle species that canola growers will find in their fields. The project also investigated whether striped flea beetle numbers indicate a major shift in flea beetle species.

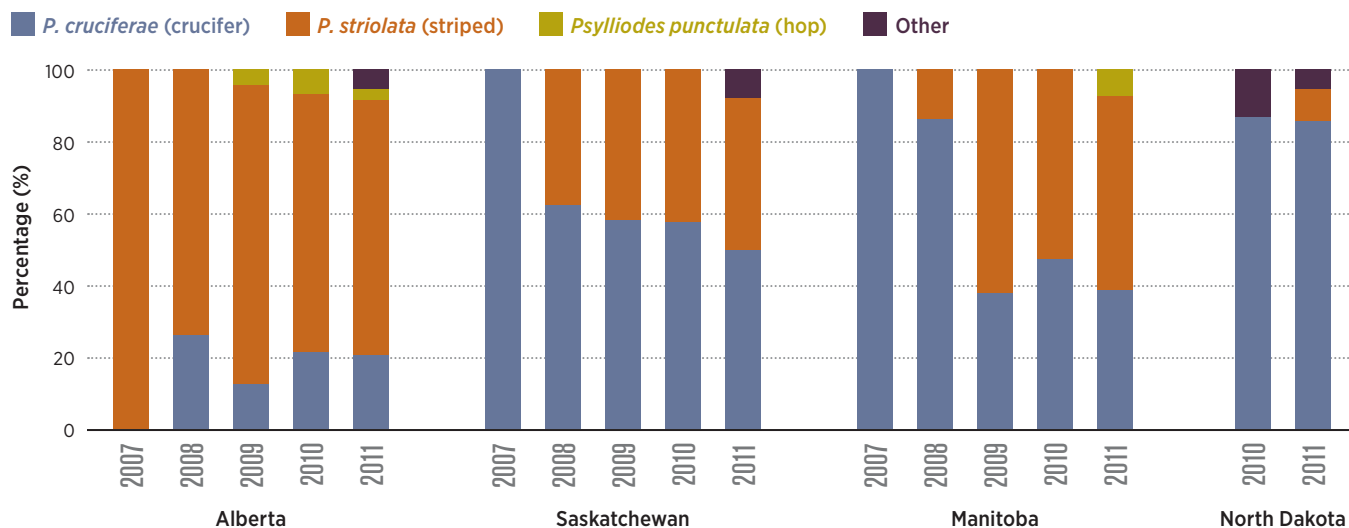
Earlier studies quantified the risk to canola from crucifer and striped species. As insecticidal seed treatments are the primary method of flea beetle management, results from Tansey et al. and Elliott concluded that control failures are more likely when populations of striped flea beetles outnumber crucifer flea

beetles, because the striped species is less susceptible to these treatments.

Principal investigator Julie Soroka conducted a preliminary survey in 2007 at 25 locations in the Canadian canola-growing region. This survey expanded to include 34, 44, 98 and 99 sites from 2008 to 2011, respectively, across the Prairies and in the U.S. state of North Dakota. Yellow sticky traps were placed in or near canola fields starting at the time of seedling emergence and for an average of three to four weeks in May and June.

In total, 11,180 traps were retrieved from 300 sites. When compared to surveys conducted in the 1970s, the numbers of striped flea beetles in

Proportion of flea beetle species collected from yellow sticky traps placed near or in canola fields in the spring across the Prairies, 2007-2011



The two most common flea beetle species are striped (top) and crucifer (bottom).



northern areas had increased dramatically. The striped species is now the most frequently encountered flea beetle in the Peace River Region and central Alberta, central Saskatchewan and much of Manitoba. Striped flea beetle is also now found in increasing numbers across southern canola fields where it was once a very rare sight.

Conclusion

Despite this shift in species frequency and the expanding range of *P. striolata's* occurrence across the prairies, *P. cruciferae* remains the predominant species in those canola fields where flea beetle numbers are particularly high.

Recommendations:

- Scout fields in the spring. Assess damage to cotyledons and the first true leaves of seedlings daily. Continue to scout until the seedlings are past susceptibility, especially when temperatures exceed 14°C.
- The action threshold for applying foliar insecticide is typically at 25 percent defoliation to reduce yield loss, but only spray if flea beetles are still present and actively feeding. For crops with lower plant populations, the action threshold will be lower. ●

in the control of cutworm numbers, parasitized cutworms also tend to feed more frequently and for longer periods, which can increase damage.

These lower rates of parasitism may be partly due to a lack of crop diversity, reduced rotations and the elimination of hedgerows and natural edges to maximize cropping space. This creates an overall agricultural landscape that may not provide parasitoids with adequate nutritional resources.

According to the data from this study, entomopathogenic fungi (EPF) caused greater cutworm mortality rates than any of the collected parasitoids and may be a more suitable biocontrol agent. Few studies have reviewed the potential of this environmentally friendly option.

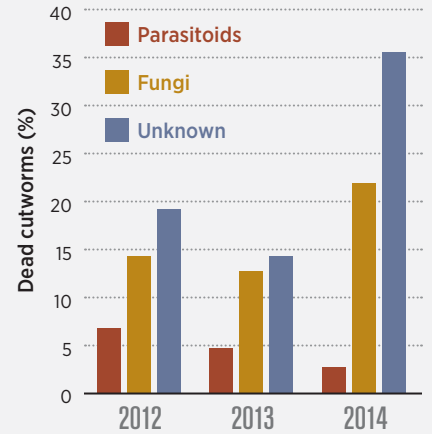
The best time for EPF application is at the early seedling stage, as cutworm damage also occurs early. Since this is the same timing as herbicide application, studies must be conducted on their interactions. Sharanowski will lead further testing on EPF as a biocontrol of cutworms in 2015-16.

Conclusions

The key to minimizing cutworm damage is early detection. Scout the fields and inspect seedlings every three to four days during the first few weeks of crop development, looking for bare areas, holes or notches in foliage, and plants that are wilting, toppling over or completely cut off.

Knowing the species of cutworm can be important because some species complete the larval stages earlier in the year than others, and some species are more likely to feed on and clip stems than others.

Cause of death for cutworms collected in Manitoba



Percentage of dead cutworms due to different mortality factors by year. All other cutworms collected for the study lived to form adult moths.

A nominal economic threshold for insecticide application may be reached at 25 to 30 percent stand reduction.

Determine if the population is patchy or evenly distributed throughout the field. High populations are often localized, leading to expanding bare patches in fields as they consume all the canola plants in an area and move outward in search of more food. Spot spraying the affected patches and a pass or two in the surrounding crop can often be effective in limiting outbreaks.

After the second or third year of infestation, beneficial organism populations such as parasitic insects, viral diseases and bacterial infections usually build up enough to begin bringing cutworm numbers down. ●