2024 Alberta Entomology Research Reports

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1. Prairie Pest Monitoring Network – Peace River region monitoring

Author and associates: Jennifer Otani[1], Meghan Vankosky[2], Keith Uloth[3]
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Abstract: The Peace River region spans the Alberta-British Columbia border and includes ~3.7 million hectares of farmland, ~1.7 million hectares of that area is sown to crops. Data collected during the 2024 growing season will be used to prepare the 2025 annual prairie-wide forecast and risk maps available in March on the PPMN website (https://prairiepest.ca/).

Problem: In-field monitoring of economic insect pests generates annual and long-term data sets that provide the basis for detecting changes in arthropod biodiversity, forecasting pest risk, or

detecting invasive species at regional, provincial, and prairie-wide levels. Since 2005, seasonal and survey-type monitoring in commercial fields in the Alberta and BC portions of the Peace River region continue. Annual data provided by this Activity ultimately supports the preparation of prairie-wide spatial distribution maps and contributes to long-term databases supporting entomological research in field crop protection.

Objectives of Research: To perform in-field monitoring of economically significant insect pests of field crops within the Peace River region using established protocols (e.g., weekly or annual monitoring). 2024 species monitoring list included flea beetles, diamondback moth, bertha armyworm, *Lygus*, swede midge, and grasshoppers.

Summary of Results:

- Commercial fields of canola within the Peace River region were monitored using sticky traps, pheromone traps, and sweep-net on a seasonal basis between late April to mid-August in 2024. Sample processing is completed.
- In BC, K. Uloth implemented in-field monitoring ***on a weekly basis*** for flea beetles (n=6 sites), diamondback moth (n=6 sites), bertha armyworm (n=6 sites), canola flower and swede midges (n=3 sites), pea leaf weevil (n=3 sites), and wheat midge (n= 5 sites). ***An annual*** grasshopper survey was completed (n=30 sites; in August).
- In AB, AAFC-Beav implemented in-field monitoring ***on a weekly basis*** for flea beetles (n=5 sites; April 10 to August 14, 2024), diamondback moth (n=5 sites; April 10 to August 6, 2024), bertha armyworm (n=4 sites; June 4 to August 6, 2024), canola flower and swede midges (n=2 sites; June 10 to August 14, 2024), Lygus (n=4 sites; June 25 to August 14, 2024), grasshoppers (n=10 sites; May 28 to August 14, 2024). ***Annual monitoring*** included a grasshopper density or species diversity collection early in August kindly supplemented with samples collected by K. Uloth in the BC Peace, plus a number of Albertan County and MD Agricultural Fieldpersons (n=~115 sites) enabling selection of grasshopper egg pod monitoring sites (n=2 sites) in September.

Continuing Research: Data from the 2024 growing season will be used to generate the 2025 annual prairie-wide forecast and risk maps in March. Seasonal monitoring and support of PPMN initiatives will continue in 2025 and 2026.

Funders: ADF-AAFC J-003121-Insect Population Dynamics (2023-2029); Peace Region Forage Seed Association supporting monitoring in the BC Peace.

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2. Annual canola survey in the Peace River region – Insect pest monitoring and characterization of canopy level arthropods

Author and associates: Jennifer Otani[1], Meghan Vankosky[2]
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Abstract: In 2024, 121 commercial fields were sampled by AAFC Staff. Canola growth stages ranged from early flower to early pod stages. The samples represent the 21st annual survey of canola production fields across the entire Peace River region (BC and Alberta).

Problem: The survey has been performed since 2003 with the main objectives of collecting canola insect pest data throughout the region and to detect introduction of the cabbage seedpod weevil into the Peace River region. Again in 2024, sweep-net monitoring (50 - 180° sweeps per canola field) was semi-randomly performed in commercial fields of canola across the Peace River region.

Objectives of Research:

- To monitor the distribution and densities of economically significant pests occurring in canola grown throughout the Peace River region (e.g., *Lygus*, diamondback moths, grasshoppers).
- To detect the movement of cabbage seedpod weevil into canola production in the Peace River region.
- To characterize the arthropod diversity in canola canopy (pests and beneficials), describe crop rotation practises, and obtain voucher specimens from the region.

Summary of Results:

- In 2024, AAFC-Beav conducted its 21st Annual Canola Survey of the Peace River region (n=121 commercial fields with signed AAFC Permission to Access forms).
- 30,502 arthropods were retrieved from the 2024 sweep-net samples, including Arachnida and Insecta with the latter separated into Hemiptera, Lepidoptera, Coleoptera, Hymenoptera, Diptera, Homoptera, Thysanoptera, Orthoptera, Odonata identified to species, genus or family levels (127 taxon units).
- *Lygus* (mean of 1.3 adults plus nymphs per 10 sweeps ± 0.15 SEM), thrips (mean of 35.8 per 10 sweeps ± 4.45 SEM), flies (mean of 0.1 per 10 sweeps ± 0.02 SEM), then aphids (mean of 3.2 per 10 sweeps ± 0.45 SEM) were the most numerous of the taxon units observed in sweep-net samples.
- No cabbage seedpod weevils (*Ceutorhynchus obstrictus*) were detected in the 2024 survey samples.
- The most common surface stubble beneath the 122 canola fields surveyed in 2024 was wheat (66 % of fields), followed by canola (11 %), barley (n=7 %), peas (n=6 %), oats or fall rye (3 % each), with the remaining 3 % of fields being either creeping red fescue, an indistinguishable cereal, or an indistinct perennial grass.

Continuing Research: The full 2024 canola survey summary will be available this winter at http://insectpestmanagement.blogspot.com/p/annual-peace-canola-survey.html .

Funders: ADF-AAFC J-003121-Insect Population Dynamics (2023-2029).

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3. Peace region living lab-Enhancing agroecosystem services in the Peace River region

Author and associates: Jennifer Otani[1], Keith Uloth[2], Kirsten Hannam[3], Talon Gauthier[4], Akim Omokanye[5]

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Abstract: According to Agriculture and Agri-Food Canada (AAFC)'s 'Tool to Determine Areas of Potential Opportunity for Carbon Sequestration on Agricultural Lands in Canada' the Peace Region has high potential to contribute to climate change mitigation via increased soil carbon storage. Furthermore, beneficial management practices (BMPs) that allow producers to reduce N_2O emissions from fertilizers while maintaining crop yield and quality have a high likelihood of adoption because they would help improve producers' profitability.

Problem: The Peace Region is an ideal location for a living lab because of its high potential for contributing to climate change mitigation while also being home to a community of highly motivated, engaged producers. The Peace Region Forage Seed Association is serving as a proponent for this proposal and has assembled a consortium of 9 other Agricultural Research Associations and producer groups.

Objectives of Research:

- Four broad BMPs of interest will be investigated: 1. cover cropping, 2. N fertilizer reductions, 3. reduced tillage, and 4. livestock integration.
- Co-benefits have also been identified as critical for monitoring, including insect pests and predators.
- Vernon pitfall traps were deployed at two 7-day collection periods at sites to compare ground level activity of arthropods in BMP versus Control treatments designated by producer-cooperators.

Summary of Results:

- The proponent organized pitfall sampling at a number of sites across the Peace River region in 2023 (n=58 sites) and 2024 (n=23 sites). Sites were prioritized by producer-cooperators and involve annual, perennial, or cover crops with each site following a "conventional" practice versus a "best management practice".
- Sample processing commenced in 2024 by AAFC-Beav staff. At time of reporting, a total of 258 pitfall samples from the 2024 field season were received with 130 of these pre-processed to Order level. Preliminary counts for these initial 2024 samples stand at 3501 Opiliones, 2076 Arachnida, 2226 Hymenoptera, 4743 Diptera, 2069 Hemiptera, 90 Orthoptera, and 4470 Coleoptera.
- Sample processing will continue with prioritization of Coleoptera adults to species with additional Orders or species to be considered for further identification on an annual basis by project participants.

Continuing Research: Pitfall sampling at sites will continue in 2025 and 2026.

Funders: Peace Region Forage Seed Association-led AAFC Living Lab project (J-002976) is funded from 01Apr2022 to 31Mar2027.
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4. Addressing emerging insect damage in grass crops grown for seed production in the Peace River region

Author and associates: Jennifer Otani[1], Calvin Yoder[2], Navneet Kaur[4]
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Abstract: Early in October of 2023, agrologists and industry representatives identified faltering commercial fields of creeping red fescue in the south of the Peace River region. Fields exhibited varying levels of clipped stems and crown die-off consistent with insect damage. Industry representatives retrieved a small number of field-collected samples for urgent help to identify causal agent(s) early in October 2023. Dissections revealed no less than three insect Orders in the grass crowns; Lepidoptera including sod webworms and cutworms, Diptera including unusual fly larvae, and Coleoptera including large weevil larvae were all present to varying degrees and actively feeding within the fibrous root systems in preparation for overwintering. By late October 2023, an estimated 1000 acres of creeping red fescue were plowed down owing to severe and irreversible insect damage (Yoder pers.comm. 2023).

Problem: The above partial identifications for the various larval specimens prompted research support to gain a better understanding of the range of insects present in the most significantly afflicted fields and to begin to quantify and project the emerging risk these overwintering larval species might pose to seed production the subsequent growing season (i.e., in 2024). Field monitoring in afflicted commercial fields of creeping red fescue was initiated late in the Fall of 2023, Spring of 2024 and again in the Fall of 2024.

Objectives of Research:

- To confirm the species of insect larvae are present using morphological or molecular identifications methods.
- To examine insect damage by species-specific larval density data with the aim of quantifying the extent of the insect problem, degree of damage, and compile associated cultivar x stand age data.
- To devise and support in-field monitoring strategies for producers to implement to assess Spring insect pest densities.

Summary of Results:

- Creeping red fescue crowns were retrieved from n=12 sites in October 2023. Crowns were dissected and all arthropods were preserved in ethanol for identification using morphology or molecular means.
- Larval species retrieved from damaged 2023 crowns included sod webworm larvae (Crambidae; mean 3.5 larvae per crown ± 0.27 SEM, n=506), glassy and yellow headed cutworms (Noctuidae: *Apamea* spp.; mean 2.8 larvae per crown ± 0.27 SEM, n=402), wireworm larvae (Elateridae; mean 0.4 larvae per crown ± 0.13 SEM, n=53), weevil larvae (Brachyceridae: *Tournotaris bimaculatus*; mean 1.7 larvae per crown ± 0.31 SEM, n=244), and march fly larvae (Bibionidae: *Bibio xanthopus*; mean 0.7 larvae per crown ± 0.71 SEM, n=107).
- Larval identifications for *T. bimaculatus* were confirmed using both molecular sequencing (N. Kaur) and subsequent examination of spring-collected adults by a taxonomic expert (AAFC-P. Bouchard). Larval identifications for *B. xanthopus* were confirmed using sequencing (N. Kaur) and spring-collected adults will be examined by a taxonomic expert (AAFC-NIS).

- In 2024, creeping red fescue crowns were retrieved again from n=6 sites between October 10-16, 2024.

Continuing Research: Fall-collected creeping red fescue crowns will be dissected. Damage assessment data will be compiled.

Funders: Peace Region Forage Seed Association supported this project (October 1, 2023-March 31, 2024).

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5. Effect of canola and field pea intercropped systems on the behaviour of the diamondback moth (*Plutella xylostella*) and its parasitoid natural enemy, *Diadegma insulare*

Author and associates: Jose Correa Ramos, Maya Evenden

Abstract: This project assesses how canola and field pea intercropped systems affect diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae), behaviour and development by examining adult oviposition, larval feeding and development and plant damage. In addition, this project will also examine how the parasitoid natural enemy of the diamondback moth, *Diadegma insulare* (Hymenoptera: Ichneumonidae), responds in intercropped systems by measuring the parasitism success rate in canola and field pea intercropped systems.

Problem: The diamondback moth is a major insect pest of canola and other brassicaceous crops during outbreak years. Economic damage is caused by larval feeding on the leaves and pods. Due to the ability of this insect pest to cause significant economic losses during major outbreak years, and growing insecticide resistance, it is important to explore new potential management solutions that focus on the natural control of the diamondback moth.

Objectives of Research: The goal of this work is to determine if canola and field pea intercrops impact diamondback moth adult and larval behaviour and host use of canola. In addition, we will determine how intercrops affect the diamondback moth parasitoid *Diadegma insulare*.

Summary of Results:

- Sampling for diamondback moth and parasitoids in commercial canola monocultures, field pea monocultures, and canola and field pea intercrops occurred during the 2024 field season across 6 sites in two regions: Camrose and Stony Plain. Sampling methods included diamondback moth pheromone-baited traps, yellow sticky cards, sweep net sampling, and yellow bowl traps.
- Field work and sampling for diamondback moth and parasitoids were also conducted in 2024 in four plot-to-field sites in Central Alberta established by the Alberta Pulse Growers. Sampling methods consisted of yellow sticky cards and sweep net sampling. Field samples from the 2024 season are currently being processed.
- Preliminary results on hymenopteran diversity from the 2023 plot-to-field sampling effort suggest that hymenopteran family diversity is not significantly different between canola

monocultures and peaola intercrops. There was, however, a significant effect of season and location on hymenopteran diversity.
- Preliminary results from laboratory experiments suggest that intercropping does not impact diamond back moth development or feeding damage on canola but fertilizer regime impacts feeding damage.

Continuing Research:
- Laboratory experiments will explore the effects of peaola intercrops on diamondback moth oviposition.
- Intercropped plants will be analyzed for nutrients and secondary plant compounds.
- Identification of insect samples to better understand diversity in peaola intercrops.
- Further sample processing to identify diamondback moth in field samples.

Funders: University of Alberta, Research Driven Agriculture Research, Alberta Pulse Growers.

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6. Pea-canola intercrop host use by specialist insect herbivores

Author and associates: Dominic Donkor, Maya Evenden

Abstract: The research focuses on using intercropping, specifically combining pea and canola ("peaola"), as a strategy to reduce the activity of specialist herbivores of canola and pea. This work examines the effect of peola intercrops on flea beetles (*Phyllotreta cruciferae* and *Phyllotreta striolata*) in canola crops and pea leaf weevils (*Sitona lineatus*) in pea. To date we have found that intercropping significantly reduces flea beetle damage and the presence of pea leaf weevils. Lab experiments of pea leaf weevil herbivory showed that intercropping and nitrogen content influenced feeding.

Problem: The significant economic losses inflicted on canola by flea beetles and pea leaf weevil in pea stipulates the need for a sustainable and effective pest control strategy.

Objectives of Research: To determine if intercropping pea and canola affects host use by specialist herbivores of canola (flea beetles) and pea (pea leaf weevil).

Summary of Results:
- Sampling for flea beetles and pea leaf weevils in commercial canola monocultures, field pea monocultures, and canola and field pea intercrops occurred during the 2024 field season across 6 sites in two regions: Camrose and Stony Plain. Sampling methods included pheromone-baited traps (pea leaf weevil), yellow sticky cards (flea beetles), and sweep net sampling.
- Field work and sampling for flea beetles and pea leaf weevils were also conducted in 2024 in four plot-to-field sites in Central Alberta established by the Alberta Pulse Growers. Sampling methods consisted of yellow sticky cards, sweep net sampling and unbaited pitfall traps. Field samples from the 2024 season are currently being processed.

- Feeding damaged was assessed for flea beetles and pea leaf weevil in commercial and plot-to-field sites in 2024.
- Initial analysis of 2023 feeding data showed significantly less flea beetle damage in intercropped plots compared to canola monoculture in plot-to-field studies.
- Initial analysis of trap capture in commercial field settings in 2023 showed that pea leaf weevils were more abundant in pea monocultures than in peola cropping systems.
- A preliminary lab bioassay illustrated that total leaf area, nitrogen content and intercropping influenced pea leaf weevil adult feeding on pea.

Continuing Research:
- Investigation of site-specific factors such as temperature, light intensity, precipitation on flea beetle populations.
- Intercropped plants will be analyzed for nutrients and secondary plant compounds.

Funders: Alberta Pulse Growers, Results Driven Agriculture Research (RDAR), University of Alberta.

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7. Comparison of commercially available allyl isothiocyanate lures and trap types to attract crucifer feeders in canola fields in central Alberta

Author and associates: Alexandra Liber[1], Boyd A. Mori[2], Maya Evenden[1]
[1] Department of Biological Sciences, University of Alberta, [2] Department of Agriculture, Food, & Nutrition Science, University of Alberta

Abstract: Striped (*Phyllotreta striolatta*) and crucifer (*P. cruciferae*) flea beetles (Coleptera: Chrysomellidae) are the most significant insect pests of canola, *Brassica napus*, on the Canadian Prairies. We studied the number of flea beetles caught on three types of traps (sticky card traps, KPT traps, and rocket traps), two of which were baited with the *Brassica* host volatile, allyl isothiocyanate (SOLIDA and ALFAScents) and one was not baited. The sticky card traps with the SOLIDA lure caught the most flea beetles, with the most capture identified as crucifer flea beetle.

Problem: Toward improving flea beetle monitoring in canola.

Objectives of Research: Examine best practices of monitoring flea beetle activity comparing three trap types and two lure types (with a non-baited).

Summary of Results:
- Flea beetle activity was highest in July and August (fall generation) (8700 flea beetles).
- The most striped flea beetles were caught on sticky card traps with the SOLIDA lure (731).
- The most crucifer flea beetles were caught on KPT traps (4636) with the SOLIDA lure, although the sticky card traps (3415) (with SOLIDA lure) were close to KPT traps. Statistical analyses of these data are on-going.
- More crucifer flea beetles were captured than striped flea beetles at study sites located in central Alberta.

Continuing Research:

- We are also assessing the attractiveness of allyl isothiocyanate-baited traps to another *Brassica* specialist, *Delia*.
- Next summer, we will test the effect of allyl isothiocyanate dose (low, medium, or high) to attract crucifer feeders.
- An olfactometer study will assess flea beetles orientation to allyl isothiocyanate lures, with and without the presence of canola plants.

Funders: Canola Agronomic Research Program (Canola Council of Canada), Alberta Canola Producers Commission, Saskatchewan Canola Development Commission, University of Alberta.

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8. Host acceptance and development of pea leaf weevil, Sitona lineatus (Coleoptera: Curculionidae) in response to Rhizobium-field pea symbiosis

Author and associates: Olajide Fatukasi, Dr. Asha Wijerathna, Dr. Malinda Thilakarathna, Dr. Maya Evenden

Abstract: Since there is evidence that symbiotic rhizobia-plant interaction may affect herbivory by influencing plant food quality and chemical defense, this research was designed to understand the effect of *Rhizobium* strains on pea leaf weevils, *Sitona lineatus* L. (Coleoptera: Curculionidae) feeding preference and development on field pea (*Pisum sativum*). Since Canada is the leading producer of pulse crops, the understanding of the host acceptance and development of the noxious pest, pea leaf weevils could contribute to the reduction of inorganic nitrogen fertilizers and promotion of integrated pest management of pests of legumes while contributing to soil and plant health, and crop yield by the process of nitrogen fixation.
Problem: Pea leaf weevil is a major insect pest of field pea and faba bean (*Vicia faba*). The economic damage to these crops is caused by pea leaf weevil adults that feed on foliage, and larvae that consume beneficial rhizobia in root nodules. Pea leaf weevil feeding decreases plant growth, fitness, soil nitrogen, and crop yield. Thus, there is a crucial need for sustainable management of pea leaf weevils to increase field pea and faba bean yield.

Objective of Research: This research is designed to test the effect of *Rhizobium* strains (wild-type 3841 and mutant-type 3940) on; 1) adult pea leaf weevil host acceptance, and 2) development of pea leaf weevils from egg to adult stage on field pea. The wild-type strain fixes nitrogen, whereas the mutant strain induces nodulation but does not fix nitrogen.

Summary of Results:

- After assessing the adult pea leaf weevils feeding damage (notches on the foliage) in a no-choice assay, we observed that inoculation of field pea with either the wild-type or mutant-type of *Rhizobium* did not affect adult pea leaf weevil feeding on 5-week-old plants, as compared to nitrogen fertilized (positive control) and control (water negative control) plants. No significant difference was observed across all treatments in the feeding damage of the adult pea leaf weevils.

- On the pea leaf weevil development, more pea leaf weevils developed from egg to adult stage on plants inoculated with the wild-type *Rhizobium*, compared to those plants inoculated with the mutant-type strain, nitrogen fertilizer or the control plants that only received water.
- Pea leaf weevils fed on plants inoculated with the mutant strain (non-nitrogen fixing bacteria) indicating that weevils can feed on root nodules that do not fix nitrogen. There was less development on the mutant-type plants, however, which could be due to small root nodules, and their inability to fix nitrogen. It could also indicate a systemic effect of the mutant *Rhizobium* on field pea volatile or water-soluble defense compounds.

Continuing Research: Current research involves processing the results of the effect of *Rhizobium* on plant nitrogen and carbon content, setting-up experiments for the effect of *Rhizobium* on pea leaf weevil larval feeding preference, and collection of field pea volatile and water-soluble chemical defense compounds induced by the treatments.

Funder: Natural Sciences and Engineering Research Council of Canada (NSERC), University of Alberta.

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9. Extraction of potential pheromonal compounds from the alfalfa weevil

Author and associates: Zachary Burgess-Akitt [1], Maya Evenden[2]
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Abstract: This study aimed to identify potential pheromone compounds of the alfalfa weevil, and determine whether weevils behaviourally respond to cues in different physiological states (reproductive, non-reproductive). Preliminary results do not support the presence of sex-specific differences in weevil extracts. Weevils respond to plant-produced volatiles in lab bioassays but this response is not enhanced by the presence of male weevils.

Problem: Alfalfa weevil, *Hypera postica* (Gyllenhal) is an invasive insect pest capable of causing high yield losses in alfalfa grown for seed.

Objectives of Research: To identify potential pheromone compounds of the alfalfa weevil, and determine whether weevils behaviourally respond to cues in different physiological states (reproductive, non-reproductive).

Summary of Results:
- No evidence for sex-specific differences in weevil whole-body extracts.
- Several compounds found in whole-body extracts are used as pheromones in other beetle species.
- Weevils respond to plant-produced volatiles in lab bioassays but this response is not enhanced by the presence of male weevils.

Continuing Research: Future research will look at the attractiveness of host plant compounds to the alfalfa weevil in field experiments. Additional lab work will be conducted to assess the behavioural activity of compounds identified in weevil extracts.

Funders: University of Alberta Undergraduate Research Initiative, Alberta Alfalfa Seed Commission.

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10. Investigating economic thresholds for Hypera postica in southern Alberta alfalfa seed production fields

Author and associates: Adele R. Beaudoin, Caitlin Watt, Héctor Cárcamo, Jennifer Retzlaff, Boyd A. Mori

Abstract: *Hypera postica* (Coleoptera: Curculionidae), the alfalfa weevil, is an economically significant pest of alfalfa, particularly in fields grown for certified seed production in Alberta. This project aims to re-evaluate the economic threshold for alfalfa weevil by comparing insecticide treated and untreated plots within alfalfa seed cropping systems. In addition, comparisons will be made between different monitoring strategies to establish the most effective technique.

Problem: Significant damage is caused by the alfalfa weevil in alfalfa seed production. Although various thresholds exist, often varying by state/province, producers in southern Alberta are finding that they seem insufficient for the damage found. Insecticide application is important in alfalfa seed production, the use of leaf cutter bees ensures that producers spray early in the season before thresholds, and before the bees are in the field. This can lead to insecticide resistance within the pest species, causing further issues in the future with pest management. Furthermore, unnecessary use of application can kill beneficial insects, including parasitoids of alfalfa weevil. This research will ideally contribute to more integrated pest management strategies for producers.

Summary of Results:

- Research in 2023 indicated an abundance of pest and beneficial insect species in both treated and untreated plots.
- Plot trials in 2023 indicated a difference in yield between treated and untreated plots.

Continuing Research:

- In 2024, samples were collected throughout the summer months at 10 field sites, near Brooks, Alberta. Collections will be processed, and analyzed, for beneficial insects, pest species, and parasitoid wasps.
- Harvest 2024 recently wrapped up. Comparisons of yield will be made across treated and untreated sites.

- Results of intensive surveys before and after insecticide application will be analyzed and compared.

Funders: Results driven agriculture research (RDAR), Alfalfa Seed Commission of Alberta, and the University of Alberta

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11. Insecticide susceptibility and biological control of insect pests on the Canadian Prairies

Author and associates: Alexis Blanchette-Arnold, Héctor Cárcamo, Meghan Vankosky, Boyd A. Mori

Abstract: The use of chemical control in the management of insect pests has led to concerns about the continued susceptibility to insecticides such as synthetic pyrethroids. This project aims to investigate current insecticide susceptibility and possible resistance in the cabbage seedpod weevil (*Ceutorhynchus obstrictus*) and the pea leaf weevil (*Sitona lineatus*) across the Canadian prairies. In addition, this project aims to investigate the current biological control *of C. obstrictus* by parasitoid wasps.

Problem: There is evidence of pyrethroid resistance in Europe, the native range of the cabbage seedpod weevil. Both species have not had recently published checks on the prairies of current levels of insecticide resistance/susceptibility. Current levels of cabbage seedpod weevil parasitism rates in southern Alberta have not been published in over a decade, so current checks are being done to see if viable biological control is occurring.

Objectives of Research:

1. To determine the current insecticide susceptibility levels of *C. obstrictus* and *S. lineatus* across the Canadian Prairies.
2. To investigate parasitoid species diversity and parasitism levels of *C. obstrictus* in Alberta, particularly in regions poorly studied in past surveys (i.e. Parkland).
3. To compare the impact of various insecticide seed treatments on *S. lineatus* damage and mortality in Alberta.

Summary of Results:

- Collection of *C. obstrictus* adults in southern Alberta for resistance testing was done across the 2024 field season with tentative results of pyrethroid susceptibility still being present.
- Collection of *S. lineatus* adults across central Alberta and Manitoba for resistance testing was done across the 2024 field season with tentative results of pyrethroid susceptibility still being present.
- Sampled canola pods from across southern Alberta to see if adult weevils or parasitoids would emerge.
- Greenhouse trial of various seed treatments on *S. lineatus* control to adults and larvae was conducted, detailed analysis is yet to be conducted.

Continuing research:

- Continued field collection in the 2025 field season for both *C. obstrictus* and *S. lineatus* across the prairies for resistance testing.
- Identification of emerged insects from Canola pods and checking to see of there was prior emergence before collection.
- Continued statistical analysis of greenhouse study findings.

Funders: Prairie Pest Monitoring Network, Government of Saskatchewan, Government of Alberta, Government of Manitoba, Sask Canola, Western Grains Research Foundation, Manitoba Crop Alliance, Sask Wheat Development Commission, Alberta Wheat Commission, Manitoba Canola Growers, Saskatchewan Pulse Growers, Alberta Canola, Prairie Oat Growers Association, Saskatchewan Crop Insurance Corporation, Agriculture and Agri-Food Canada, and the University of Alberta.

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12. Insecticide susceptibility and resistance monitoring of flea beetles in canola

Author and associates: Aziz Ullah, Priyanka Mittapelly, Boyd A. Mori

Abstract: To manage flea beetles, almost all canola is grown from insecticide treated seeds and, if needed, sprayed with foliar insecticides. We carried out three separate experiments to assess the susceptibility of crucifer (*Phyllotreta cruciferae*) and striped (*Phyllotreta striolata*) flea beetles to neonicotinoid and pyrethroid (deltamethrin) insecticides across the Prairies. The results from this project will help in understanding the damage caused to canola seedlings and insecticide tolerance (both neonicotinoid and foliar pyrethroids) in crucifer and striped flea beetles.

Problem: Insecticides are the primary means of flea beetle management. Given that insecticides are the main method of control, it is crucial to examine the resistance of flea beetles to insecticides in Canada.

Objectives of Research:

1. To survey the susceptibility of crucifer and striped flea beetles to neonicotinoid insecticides across the Prairies
2. To observe the repellent/antifeedant effects of neonicotinoid insecticides against flea beetles
3. To survey the susceptibility of crucifer and striped flea beetles to pyrethroids (deltamethrin) across the Prairies

Summary of Results:

- Flea beetles were collected across Prairies in 2022-2024 and bioassays were conducted under controlled conditions.
- There was significantly lower feeding damage and higher mortality when seeds were treated with neonicotinoid seed treatments compared to the controls.
- We observed variation in seedling damage and beetle mortality across different flea beetle populations and years.

- The two-choice olfactometer bioassay results suggests that the seed treatments had a more significant antifeedant effect on flea beetles.
- The flea beetles demonstrated no resistance to the foliar deltamethrin (group 3: synthetic pyrethroid).

Continuing Research:
- The research data has been collected, analyzed and now writing manuscript.

Funders: Canola Council of Canada, Alberta Canola, Manitoba Canola Growers Association, SaskCanola, Bayer, Syngenta, Western Grains Research Foundation, the Natural Sciences and Engineering Research Council of Canada (NSERC Industrial Research Chair Program) and the University of Alberta.

Contact: Boyd A. Mori (bmori@ualberta.ca)

13. Examining introgressed (Brassica napus X Sinapis alba) lines for resistance against flea beetles (Phyllotreta spp.)

Author and associates: Aziz Ullah, Altaf Hussain, Sally L. Vail, Boyd A. Mori

Abstract: The introgression of resistance traits among Brassicaceae is a promising approach to bolster pest resistance in canola. The resistance within the introgressed and Brassicaceae lines against crucifer flea beetle (*Phyllotreta cruciferae*) was assessed at the cotyledon stage. Host plant defense against flea beetles varied among the introgressed and Brassicaceae lines.

Problem: The potential for resistance to insecticides underscores the significance of investigating alternative management strategies, such as host plant resistance. Canola employs both constitutive and inducible glucosinolates based chemical defense mechanisms against pests which are less studied in flea beetle management.

Objectives of Research:
1. To investigate host plant resistance in introgressed lines of *B. napus*, *S. alba* and determine the underlying mechanisms of resistance
2. To observe the glucosinolate and chlorophyl content in introgressed lines of *B. napus* and *S. alba*.

Summary of Results:
- Flea beetle damage reduction was evident in some introgressed lines across generations as compared to both *B. napus* and *S. alba* controls when the beetles were offered one line at a time.
- Flea beetle damage reduction was also evident in some introgressed lines across generations as compared to both *B. napus* and *S. alba* controls when the beetles were offered all lines at the same time.
- Some introgressed lines had significantly higher relative chlorophyll content (SPAD) compared to both *B. napus* and *S. alba* controls.

- Linear electron flow (LEF) varied among the introgressed lines and *B. napus*, *S. alba* controls. LEF describes light driven electron flow for plant energy and food production processes within the chloroplast.
- The glucosinolate analyses (to be conducted) will provide additional insights into the differences in flee beetle damage to seedlings.

Continuing Research:
- The analyses of glucosinolates in cotyledons will be conducted to determine the distinct glucosinolate profiles present in the introgressed lines, as well as in the *B. napus* and *S. alba* controls.

Funders: Natural Sciences and Engineering Research Council of Canada (NSERC Industrial Research Chair Program), Alberta Grains, Alberta Pulse Commission, Alberta Canola Producers Commission and the University of Alberta.

Contact: Boyd A. Mori (bmori@ualberta.ca)

Olds College – School of Life Sciences and Business

14. Biology and Distribution of an Alien Invasive Species new to Alberta, the Lily Leaf Beetle, Lilioceris lilii (Scopoli)

Author and associates: Ken Fry

Problem: The alien invasive species, *Lilioceris lilii*, was first detected in North America in Montreal in 1943 (LeSage 1983) but has since spread to Ontario (Bouchard *et al*. 2008), the Maritimes (Majka & LeSage 2008), and Manitoba (Elliott & LeSage 2004). This beetle was reported from cultivated lilies in Airdrie, Alberta in 2006 (unpubl. res.). Both cultivated and native species of *Lilium* are threatened by this pest.

Objective of Research: The objective of this part of the project is to determine the viability of the parasitoid, *Terastichus setifer*, for biological control of the lily beetle.

Summary of Results:
- Adult parasitoids were obtained from the lab of Dr. Naomi Cappucino at Carleton University in the summer of 2014 and again in the summer of 2015. One hundred adult parasitoids were released in the lily collection on the campus of Olds College in 2014 and again in 2015. Fifty adult parasitoids were released at the Reader Rock Garden and the Calgary Zoo in Calgary, and in Airdrie Alberta in 2015.
- Parasitised lily beetle larvae have been recovered from each release locality. Lily beetle populations have decreased substantially in Olds, Central Calgary and Airdrie in the 10 years following release. The parasitoid is now considered to be established in these localities.

Continuing Research: Continued funding from the Alberta Regional Lily Society will allow for continued monitoring of the establishment and spread of the parasitoid and for continued releases of the parasitoid from parasitised field-collected beetle larvae.

Contact: Ken Fry

15. Surveillance of alien invasive species attacking urban tree species

Author and associates: Ken Fry (OC), Janet Feddes-Calpas (StopDED), Troy Kimoto (CFIA)

Problem: The establishment and expansion of the global marketplace has resulted in an increased risk of introduction to Canada of alien invasive species threatening our urban forests. The Canadian Food Inspection Agency (CFIA) is "dedicated to safeguarding food, animals and plants, which enhances the health and well-being of Canada's people, environment and economy." The Society for the Prevention of Dutch Elm Disease (StopDED) has established a reliable system and infrastructure to monitor Dutch Elm Disease vectors in Alberta. A relationship has been developed between CFIA and StopDED that seeks to exploit the resources and capabilities of their respective organizations in pursuit of the protection of Canada's trees.

Objective of Research: It is proposed to establish and maintain an alien invasive species monitoring program in Alberta for the early detection of alien invasive species of wood-boring insects. This proposal builds on a pilot project conducted by StopDED from 2007-2009 (Invasive Alien Species Partnership Program Project #1294) and contracted work by Olds College from 2010-2024.

Summary of Results:

- Protocols and methodologies have been established for trap deployment and collection, trap residue processing, and reporting. Fifteen localities in Alberta considered to be high risk for importation of wood boring insects were monitored using four Lindgren funnel traps at each locality. The traps were baited with one of four different lures; α-pinene, ethanol, *Sirex* pheromone, or Ips exotic bark beetle lure in combination with ipsenol (2010-2015) or with one of two lures; Monochamol + Ipsenol, α-pinene, and Ethanol on one pair of traps and Fuscamol, Fuscamol Acetate, and Ultra High Release Ethanol on the other two traps. Traps were serviced bi-weekly and residues were processed at Olds College.
- No alien invasive species have been detected thus far in the program. The Fort McMurray fire aftermath was indirectly detected as indicated by trap captures of *Trypodendron lineatum* increased from an average of 100-200 beetles per sample to in excess of 14,000 beetles in 2019 following the devastating fire in 2016. *Trypodendron lineatum* is an ambrosia beetle that functions in the decomposition process of woody material.
- Range expansions into Alberta for several species of beetles have been detected, for example:
    - *Callidium hoppingi* - Medicine Hat
    - *Semanotus terminatus* - Medicine Hat
    - *Neoclytus acuminatus* - Medicine Hat
    - *Stenocorus trivittatus* - Medicine Hat
    - Neanthophylax mirificus - Grande Prairie

Continuing Research: The project has funding until 2026.

Contact: Ken Fry

16. Miscellaneous Horticulturally relevant Insect Sightings

Author and Associates: Ken Fry (OC) with content provided by Alex Coker (City of Calgary) and Mike Jenkins (City of Edmonton)

Problem/Summary:

- The Elm Beetle, *Xanthogaleruca (=Pyrrhalta) luteola,* was detected on elm in Medicine Hat in the summer of 2024. Its extent is not known at this time.
- The Viburnum Beetle, *Pyrrhalta viburni,* has been recorded from Calgary and Edmonton in low-density populations.
- The Spongy Moth, *Lymantria dispar dispar*, has been trapped in Calgary the past few years but the populations do not seem to be persistent (= established). CFIA is working with the City of Calgary to conduct delimiting trapping to determine the extent of the population.
- The Asian Longhorned Beetle, *Anoplophora glabripennis*, was collected from wood material in Edmonton. It is suspected that the beetles emerged from wood packing material located in an industrial facility. The area has been inspected and no further beetles have been detected and no infested trees have been identified.

Awaiting confirmation:

- A Hemipteran soft scale or mealybug was collected from turfgrass in central Alberta. This would be the first record of turfgrass scale in Alberta. Confirmation of the identification is in progress.
- A cynipid oak gall wasp, potentially *Andricus quercuspetioicola* which is known from Manitoba and east was collected from Bur Oak near Olds, Alberta. Awaiting specimens to finalise the identification.

Alfalfa Seed Commission of Alberta

17. Insecticide products and their efficacy against alfalfa weevil (*Hypera postica*)

Author and associates: Jennifer Retzlaff

Abstract (3 sentences): In the last 7-10 years, a major defoliating pest of alfalfa seed crops in western Canada, the alfalfa weevil (Hypera postica) has developed insecticide resistance to group 3A synthetic pyrethroids (active ingredient (AI): lambda-cyhalothrin), complicating spray management practices and creating the need to explore lesser used chemistries. Given the limited number of insecticides producers must work with and the prevalence of the alfalfa weevil issue, producers are interested in having more products with alfalfa weevil on label, and full understanding of their suppression/control efficacy. In plot trials across 10 site-years in the Brooks area, products with lambda cyhalothrin, acetamiprid, spinosad, and chlorantraniliprole were tested at various rates and application pre-bee release timings.

Problem/Opportunity: Alfalfa seed is a lucrative crop, but insect pests require careful management to maximize efficacy of insecticide use while minimizing impact on the alfalfa leafcutting bees that are required to pollinate the field and produce seed. Alfalfa weevil, lygus and alfalfa plant bugs are the main pests, which growers spray insecticides 1-2 times before bees and at times producers will spray fields again once pollination is complete to regain control over plant bugs. Producers must weigh the cost and benefit of spraying and with what type of insecticide, to achieve adequate

control before and after bee release, while avoiding the overuse of active ingredients. This work aims to provide producers with information on the efficacy of products and tank mixes on alfalfa weevil at multiple timings pre-bee release.

Objective: To determine appropriate insecticide products and timing for pre-bee release weevil control.

Summary of Results (maximum of 5 bullets)

- 10 site-years of plot trials conducted through Farming Smarter in southern Alberta.
- All weevil instars and adults being counted in plots.
- The fields were harvested in September and October.
- Preliminary results suggest continued high variability in efficacy of products with lambda-cyhalothrin and increased efficacy of some tank-mixes.

Continuing Research: Data is currently being analyzed.

Funders: Alfalfa Seed Commission of Alberta

Contacts: Jennifer Retzlaff (researchmanager@alfalfaseedab.com).

University of Lethbridge

18. A multi-region multi-year study of diversity, biogeography, and sampling methods of Orthoptera of Peace and Athabasca regions of northern Alberta

Author and associates: Dan L. Johnson and Jason Cheng

Abstract (3 sentences): We conducted a collaborative survey in the four northern regions of Alberta, with the Association of Alberta Agriculture Fieldman, and Alberta Agriculture and Irrigation (Shelley Barkley, Scott Meers) which resulted in 12,686 Orthoptera, comprising of 688 locations from 2014-2019.

Problem: The diversity and biogeography of Orthoptera of northern grassland regions in Canada was not well known. We conducted a collaborative survey with verified identifications of specimens in order to develop accurate distributions and maps.

Objective of Research: The objective was to develop a database of grasshopper species, locations, age class, region, vegetation type, year, and numbers for four northern regions of Alberta. In collaboration with the Association of Alberta Agriculture Fieldmen, and Alberta Agriculture and Irrigation, we held workshops on sampling and identification. Surveyors from 31 northern counties and districts used sweepnets for standardized collections (typically 25 sweeps each) along field margins and vegetated roadsides. They submitted 688 frozen sample bags during 2014-2019. The bags of collected Orthoptera were sent to the University of Lethbridge for cleaning, sorting, and identification of species and age class.

Summary of Results:
A total of 12,686 Orthoptera were identified (by DLJ), none unidentified, yielding a database of species, age class, location, region, vegetation type, and year. Overall results for the submitted specimens: 27 species in total; Melanoplus bruneri (Bruner's Spur-throat Grasshopper), 61%, Pseudochorthippus curtipennis (Marsh Meadow Grasshopper), 22%, Melanoplus borealis (Northern Spur-throat Grasshopper) and Melanoplus bivittatus (Two-striped Grasshopper) at 5-6% each, and Camnula pellucida (Clear-winged Grasshopper), 2%. This list for 2015-2019 was augmented by field trips to the northern regions by DLJ during 2017-2023.

Continuing Research: We provided AAAF 33 pinned collections of common species, and summary tables for each of counties and municipla districts involved. We compared sampling methods, methods of GIS modelling, and trends over years, diversity indexes, and spatial point analysis. We geo-located samples and compared to standard survey results, assessed parasitism of the dominant species (n=700 live field collections), and compared species composition to environmental variables. We have assessed the role of weather on population trends, and conducted DNA analysis of geographical variation of the dominant species.

Funders: Canadian Agricultural Partnership (funding provided to University of Lethbridge); Association of Alberta Agriculture Fieldmen (field work)

Contact: dan.johnson@uleth.ca

Agriculture and Agri-Food Canada – Lethbridge Research and Development Centre

19. Advancing monitoring and decision-making tools for wireworm and nematodes in Alberta

Author and Associates: Haley Catton, Wim van Herk, Keshav Singh, Shabeg Briar

Abstract (3 sentences): Current monitoring for wireworms and plant parasitic nematodes is labour intensive and limits informed decision-making. This project determined that yield differences in wheat can be detected in overhead images taken in June, but linking differences to pest populations is complex due to confounding factors.

Problem: Better wireworm monitoring methods are needed to help producers decide if they need to invest in insecticide seed treatments; almost nothing is known about plant parasitic nematodes in wheat.

Objective of Research: Determine if overhead imagery can be used to monitor for wireworm and/or plant parasitic nematode damage.

Summary of Results:
- Data collection is complete and final sample processing and analysis is underway.
- Preliminary results show no difference in the nematode populations of areas of poor and good wheat growth.

Continuing Research: None yet.

Funders: Results Driven Agriculture Research, Alberta Pulse Growers Commission, Alberta Wheat Commission, Saskatchewan Wheat Development Commission

Contact: Haley Catton (haley.catton@agr.gc.ca) (wireworms); Shabeg Briar (sbriar@oldscollege.ca) (nematodes)

20. Investigating RNAi as a management tool for Prairie wireworms

Author and Associates: John Laurie, Haley Catton, Wim van Herk, Justin Pahara, André Laroche, Rodrigo Ortega Polo, Arun Kommadeth

Abstract (3 sentences): Wireworms are a group of pests of serious concern for many growers in Alberta. We aim to develop RNAi as a tool to control key Prairie pest wireworm species. RNAi has the potential to be powerful, targeted, and environmentally friendly and has been shown to have efficacy against over 20 insect crop pests.

Problem: Wireworms are a serious problem and chemical seed treatments have problems with efficacy and potentially non-target effects and regulation. RNAi would be a more targeted and sustainable approach for wireworm control.

Objective of Research: Build the foundation of RNAi control for key Prairie wireworm pest species.

Summary of Results:

- de novo assemblies of gene expression have been made for larval and adult forms of 3 Prairie wireworm species.
- Rarget genes have been identified
- Experiments for getting dsRNA into specimens are underway.

Continuing Research: To be determined.

Funders: Western Grains Research Foundation, Alberta Wheat Commission, Results Driven Agriculture Research, Saskatchewan Wheat Development Commission

Contact: John Laurie (john.laurie@agr.gc.ca); Haley Catton (haley.catton@agr.gc.ca)

21. Beneficial insects in Prairie crops: quantifying the value and vulnerability of biological pest control

Author and Associates: Haley Catton, Tim Skuse, Héctor Cárcamo, Kevin Floate, Jennifer Otani, Emma Stephens, Meghan Vankosky, Tyler Wist, Jim Tansey, John Gavloski.

Abstract (3 sentences): Beneficial insects provide value in cropping systems, however that value is not quantified, and often not considered in economic thresholds. This project is focusing on advancing knowledge of predators and parasitoids in Prairie agricultural fields and developing a

research road map. A tritrophic phenology model of wheat – wheat stem sawfly – Bracon cephi is underway.

Problem: Most insecticide use targeted at pests harms beneficials and the services they provide, therefore farmers incur a hidden cost when using pesticide.

Objective of Research: This project will provide a first step to tackling the challenge of quantifying the value and vulnerability of the beneficial insect community. It will summarize existing information and identify priority areas for future research.

Summary of Results:
- The project has suffered delays due to the pandemic and other reasons, but is ongoing.
- Population modeling of wheat stem sawfly and its parasitoid *Bracon cephi* is underway.

Continuing Research: Due to delays, the project has been extended to 2025.

Funders: Alberta Agriculture and Forestry, Alberta Wheat Commission, Alberta Barley, Saskatchewan Wheat Development Commission, AAFC

Contact: Haley Catton (haley.catton@agr.gc.ca)

22. Quantifying farmer crop insect management practices in Alberta crop fields

Author and Associates: Emma Stephens, Haley Catton

Abstract (3 sentences): Insect pest management practices are an important part of crop farming with economic and environmental impacts. However, very little is known on what crop producers actually decide to do, and how they make those decisions. This survey will provide detailed baseline data on farmers' knowledge and practices regarding insects in their fields.

Problem: Not enough is known on how producers make decisions about insect management in their fields. If we can learn this, we can target research and outreach efforts to improve management.

Objective of Research: This project quantifies insect pest management practices and decision-making by Alberta crop farmers.

Summary of Results:
- 80% of surveyed farmers scouted their fields for insects. Use of economic thresholds was high (>80%).
- Flea beetles were the most commonly observed and sprayed pest among cereals, canola and pulses, grasshoppers were in second place.
- Farmers grouped into two typologies of insect pest management: a group that tended to use more IPM methods, and a group that did not.
- Farmer awareness of beneficial insects is very low.
- Two manuscripts are very close to submission.

Continuing Research: None yet.

Funders: Alberta Wheat Commission
Contact: Emma Stephens (bioeconomist, emma.stephens@agr.gc.ca); Haley Catton (haley.catton@agr.gc.ca)

23. Sustainable management of cereal leaf beetle in Ontario wheat

Author and Associates: Lauren Des Marteaux, Haley Catton, Jocelyn Smith, Tracey Baute

Abstract (3 sentences): Cereal leaf beetle (CLB) is a threat to wheat, and recent surveys have showed that the expected parasitoid Tetrastichus julis is either absent or in very low levels in southern Ontario fields. Our surveys have detected at least two unknown parasitoids in CLB that have not been reported in Canada. We are surveying to detect CLB abundance, parasitism rates, and larval phenology, to support predictive modeling for targeted monitoring for southern Ontario.

Problem: Cereal leaf beetle populations are re-bounding in southern Ontario. The parasitoids that were assumed to be regulating the population (Tetrastichus julis) is unexpectedly absent or in very low levels, but other parasitoids are present and little is known about them.

Objective of Research: This project is assessing the current CLB and parasitism situation in southern Ontario to guide future management efforts. We are rearing unknown parasitoid larvae into adults in Lethbridge quarantine for morphological identification.

Summary of Results:
- Two parasitoid species not reported in Canada have been discovered in southern Ontario CLB larvae. One is confirmed to be Lemophagus curtus, an ichneumonid released in the USA in the 1970s. The other species identity is so far unconfirmed.

Continuing Research: Two more years of sampling.

Funders: Grain Farmers of Ontario, AAFC Sustainable Canadian Agricultural Partnership

Contact: Haley Catton (haley.catton@agr.gc.ca); Lauren Des Marteaux (lauren.desmarteaux@agr.gc.ca)

24. Survey of *Peristenus* parasitism of lygus in various crops in southern Alberta

Author and associates: Héctor Cárcamo, Brendan Roy, Valentina Ibarra Galvis, Bronwyn Taylor

Abstract: *Peristenus* wasps, primary parasitoids of lygus bugs, predominantly target lygus nymphs in alfalfa and non-cultivated areas. It was unclear if they also parasitize lygus in other crops like mustard, faba, and lentils. Our 2024 study found high parasitism rates in second generation lygus in canola, kochia, and alfalfa.

Problem/opportunity: Lygus are widespread generalists pests of many crops, but little is known about the occurrence of their natural enemies such as *Peristenus* parasitoids in annual field crops. Including crops that favour natural enemies may help long term management of crop pests such as lygus.

Objectives of Research:

1. Determine the occurrence of *Peristenus* parasitoids in various crops including emerging crops
2. Determine phenological patterns of parasitism at key crop stages and in relation to lygus species and demographics

Summary of results:

- Thousands of lygus nymphs (2^{nd}, 3^{rd}, 4^{th}, 5^{th} instars) were dissected during the summer of 2024 from several crops and sites around southern Alberta from late May to early August.
- Canola, Kochia, and Alfalfa had the highest rates of parasitism, around 23% average, but nymphal cohorts were sometimes over 75% parasitized.

Continuing research: The Alberta field component of this study is mostly complete and the focus will shift to molecular analysis of larval samples to determine the occurrence of peristenus species throughout the season.

Funders: Western Grains Research Foundation and Alberta Canola Producers Commission

Contact: Héctor Cárcamo

25. On the lookout for pollen beetle in Alberta

Author: Héctor Cárcamo, Brendan Roy, Valentina Ibarra Galvis, Christine Noronha

Abstract: The pollen beetle is a serious pest of spring canola crops in Europe and occurs in Eastern Canada and the Maritimes. In southern Alberta in 2024, we sampled 12 locations at early flower and/or early pod stage. Samples will be processed later this fall.

Problem/opportunity: The pollen beetle (*Brassicogethes viridescens* (Coleoptera: Nitidulidae) is a serious pest of *Brassica* oilseed crops in Europe and it has been reported in P.E.I, Nova Scotia, Ontario, and Quebec.

Objectives of Research: To survey canola fields for occurrence of pollen beetle in southern Alberta.

Summary of Results:
We do not have any data for the 2024 samples however, we will also be documenting lygus abundance and species composition, and abundance of other canola pests including diamondback moth and cabbage seedpod weevil from these samples to increase the information collected.

Continuing research: The survey will be concluded once samples have been processed.

Funding: Alberta Canola, SaskCanola, and Manitoba Canola Growers

Contact: Héctor Cárcamo, Christine Noronha.

26. What do Lygus like? Potential trap crops to protect faba bean

Author and associates: Teresa Aguiar-Cordero, Héctor Cárcamo, Brendan Roy, Valentina Ibarra Galvis, Sean Prager

Abstract: Although Lygus bugs are polyphagous, they have plant preferences. A two year plot study was conducted near Lethbridge in 2022-2023 to assess lygus abundance in various crops adjacent to faba beans. Our findings suggest that safflower and sunflower could have potential as trap crops to reduce *Lygus* damage to faba beans, though the effectiveness of trap cropping is contingent on appropriate timing and management practices.

Problem/opportunity: Lygus bugs are generalists pest of multiple crops. As of 2021 outbreaks in various crops have become more frequent. In California, trap cropping is a routine practice along with vacuuming of strawberries.

Objectives of Research: To compare abundance of lygus and damage in faba beans planted adjacent to various crops, in 2023: flax, canola, mustard, hemp, sunflower, safflower, peas.

Summary of Results: Field studies showed that faba beans adjacent to canola had higher *Lygus* abundance and damage compared to those next to peas, flax, and safflower. Safflower and sunflower demonstrated potential as trap crops to reduce *Lygus* damage to faba beans. Our findings provide insights into *Lygus* behavior and suggest that a combination of trap cropping, and targeted insecticide use could mitigate the impact of *Lygus* infestations on faba bean cultivation.

Continuing research: The field component is completed.

Funding: Saskatchewan Agriculture Development Fund, Saskatchewan Pulse Growers, Western Grains Research Foundation grant awarded to S. Prager.

Contact: Héctor Cárcamo, Teresa Aguiar-Cordero, Sean Prager.