

Alberta Agriculture and Forestry

2015 Entomology Program Annual Report

The Entomology Program strives to provide Alberta's agricultural industry with timely, accurate insect management information.

The program is built on four strategic pillars: monitoring, surveillance, research and communications.

Monitoring

Bertha armyworm (*Mamestra configurata*) is monitored using pheromone baited green unitraps. Traps are set up in pairs on the margins of canola fields in mid-June (in the Peace country only 1 trap per site to reduce the bumblebee catch). There were 265 sites across the province from Cardston to Fort Vermilion. Traps were managed by all parts of the agriculture industry. This is our most successful survey due in the most part because of the excellent industry support.

In 2015 there were only 6 locations reporting the first reporting level of more than 300 moths. Five out of the 6 were in the Calgary area and south. The bertha armyworm population mostly collapsed in the remainder of the province, likely due to the impact of diseases and parasitism in those areas that had high populations in previous years.

There was very little need for spraying with the exception of a small area in the northern Peace Region. This small outbreak occurred in an area not covered by the pheromone trapping system. We will be working to rectify this in 2016 by placing traps in those areas.

It is difficult to accurately predict the 2016 bertha armyworm population based on the 2015 moth catch, but the trend appears to be lower populations in almost all regions of the province. The slightly elevated traps in southern Alberta could have the potential for increasing bertha armyworm populations in 2016

Experience has taught us that areas of small outbreaks such as the one in the northern Peace often get larger in the second year. In addition, research has clearly shown that snow cover encourages successful pupal overwintering.

It is critical to continue to have very good coverage of pheromone traps in 2016 for the early warning of potential problems they provide during the growing season.

Diamondback moth (*Plutella xylostella*). In 2015, 35 sentinel trap locations were established across Alberta. Trap catches showed a moderate but early moth flight. The good news is threshold levels of insects never did develop though. Trap sticky cards with moths on them were collected from

cooperators and sent to Agriculture and Agri-Food Canada in Saskatoon for population studies.

Pea leaf weevil (*Sitona lineatus*) –The pea leaf weevil survey was completed by Alberta Agriculture and Forestry staff in late May through early June. In 2015, damage ratings were done in 111 fields in 35 counties. This survey uses the feeding damaged caused by the adult weevil as a proxy for the population.

Overall the pea leaf weevil feeding damage was lower in 2015. Although experience has shown that should the conditions be favorable in the spring of 2016, there could be significant feeding damage. The most severe damage in 2015 were in areas southeast of Lethbridge and in Red Deer and Lacombe counties. For producers south of Highway 9 and along Highway 2 up to Leduc there is risk of damaging levels of pea leaf weevil in 2016. This information and experience will help plan control strategies for 2016 crop year. Research has shown that seed treatment is much more effective in reducing losses from pea leaf weevil than foliar insecticide treatments.

There was significant pea leaf weevil damage on fababeans in a much larger area than shown in this survey on field peas. This insect causes as much or more damage on fababeans. The true economic damage of this pest on pea and fababean on the higher organic matter soils of central Alberta is not well understood.

Grasshoppers The risk of economically significant grasshopper populations in 2016 has increased in northern central Alberta and the Peace regions. There were areas in the Peace that the 2015 population was severe.

In southern Alberta, the risk has been increasing for the last few years. Even though the populations are generally lower, several areas, Fourty Mile, parts of Cypress and Willow Creek counties, could have problems if the spring is favorable for grasshopper development.

We want to acknowledge the commitment and support of the Agriculture Fieldmen across Alberta in doing this survey. There were 2790 total sites surveyed in 59 counties. As well, thank you to David Brennan, Alberta Agriculture and Forestry, for coordinating the survey and to Jan Lepp, Alberta Agriculture and Forestry for managing the data stream.

Wheat midge (*Sitodiplosis mosellana*) Levels of wheat midge across Alberta were general lower. Although there does seem to be a slight increase in the Eastern Peace Region following the 2014 population collapse. Wheat midge has not followed our forecasts very well in the Peace, it is important to note that there are sufficient populations for a resurgence if conditions, delayed crops and higher than normal rainfall, occur in 2016.

In central Alberta, there are areas east of Edmonton with high numbers, and in the south the population is pretty low with the exception of some irrigated fields. This survey is based on 337 soil samples from 61 counties, from the

Sweet Grass Hills to Fort Vermilion. We want to acknowledge the help from the Applied Research Associations and the Agriculture Fieldmen, David Brennan and Kathrin Sim of Alberta Agriculture and Forestry who assisted us with soil sampling for this survey.

Wheat midge pheromone traps There were 34 locations where cooperators checked pheromone traps on a more or less daily basis for midge emergence. This system seems to have possibilities in helping producers determine the timing of wheat midge activity. There are still many questions though.

Wheat stem sawfly (*Cephus cinctus*) We surveyed 93 fields from 20 counties in southern and east central Alberta after harvest. Seventy-nine of the 93 fields had zero to very little cutting damage.

Elevated, but very low, sawfly numbers were found in the southern counties from Willow Creek to the Saskatchewan border south of Highway 1 and in isolated areas in Special Area 3 and in Flagstaff County. Despite these finds, concern for sawfly remains very low, but if dryer conditions continue, there could be a population resurgence. Thanks to Wayne Spurrill for reporting the damage in Flagstaff county.

Cabbage seedpod weevil (*Ceutorhynchus obstrictus*) We swept 273 canola fields in 49 counties through southern and central Alberta for cabbage seedpod weevil. Results from this survey are strengthened by reports from agrologists as they scout fields for their customers using an online reporting system. Fifty-seven fields were reported using this system.

The cabbage seedpod weevil was again found at economic levels in southern Alberta including the Municipal District of Pincher Creek. In addition, economic levels of cabbage seedpod weevil were found well north of Highway 1 into central Alberta. It will be important to scout to make control decisions in central Alberta as the range of economic levels did expand in 2015.

The northern range pushed even further into Lacombe County and well into Stettler, Paintearth Counties and the Municipal District of Provost. This expansion is further north than any range expansions in other years. Previous incidences of northern range expansions did not persist so it will be important to watch the population over the next couple years.

Surveillance

Western bean cutworm was not found in the 2 pheromone baited surveillance traps that were employed in 2015. We will be increasing this survey to 6 sites total in 2016.

Suction trap The suction trap continues to be in operation at Brooks. It is run during daylight hours, from April to June and is used to watch for new insects that might migrate into our area. It is also useful to pick up

migrations of aphids (Russian wheat aphid), aster leaf hoppers and diamondback moths in the spring.

Lessor grain borer surveillance was done at 3 grain terminals in southern Alberta in cooperation with the Canadian Grain Commission. Samples collected from a pheromone baited trap, were sent to the grain commission for analysis. Lessor grain borer has been confirmed in pheromone traps in several locations in southern Alberta.

No lessor grain borer have been found in grain shipments. In 2016, we will be expanding this surveillance project to 6-10 sites from southern Alberta to the Peace.

Swede midge This insect was not found at the 27 sites using pheromone traps. Traps were run by volunteers throughout Alberta concentrating on the Alberta-Saskatchewan border, the area surrounding Edmonton and the east of Edmonton to the Saskatchewan border. Sticky cards were sent to Agriculture and Agri-Food Canada, Saskatoon for evaluation. The insect was found in a mid season visual survey in two fields by a researcher from Agriculture and Agri-Food Canada, Saskatoon, just over the Alberta-Saskatchewan border, south of Lloyminster.

Invasive Alien Species We cooperate with the Society to Prevent Dutch Elm Disease (STOPDED) and Canadian Food Inspection Agency in monitoring for invasive tree pests like emerald ash borer. The Crop Diversification Centre South (Brooks) is one of 10 sites across Alberta. Bi-monthly trap catches are sent to Dr Ken Fry in Olds for processing. A reporting of the results will be available from STOPDED in April.

Potato psyllid We have been collaborating with Dr. Dan Johnson on the potato psyllid monitoring system. Very low levels of psyllid were found in Alberta. The good news, the zebra chip organism vectored by the insects was not present in them. This project is entering its final year in 2016

Report from the Rearing Room

Things were very quiet in the rearing room in 2015. April 2, we field collected 15 cutworms from the Foremost area and put them on artificial diet. They were very slow to move through their lifecycle, with only 2 reaching the pupal stage.

European skipper larvae were collected in late June and reared through to adult, without being put on artificial diet. The adults are in storage waiting to be curated into the collections.

Leaves from pea, fababean and alfalfa with leaf miner damage were field collected and put into petri-dishes with agar. The intent was the agar gel would keep the leaves alive long enough to get the insects to pupate. This failed. In 2016, we are going to try leaf surface sterilization and try the agar again as well as use the moistened filter paper technique which has been somewhat successful in previous years.

Research

Development and implementation of weather based, near real time crop insect pest monitoring \ Prediction model and program for Alberta.

2015 was the second of this three year project that will tie the development of insects into the weather system as operated by Alberta Agriculture and Forestry. A technician based out of Brooks managed a research site for midge, alfalfa weevil and bertha armyworm at Bow Island and 2 sites at Brooks for alfalfa weevil. A Stettler-based technician managed a wheat midge site at Consort and an alfalfa weevil site at Red Willow. The Falher based technician managed 4 sampling locations for wheat midge. Depending on the insect, sites were visited weekly or bi-weekly. Sampling was done depending on the insect by taking sweep net samples, sticky card samples, soil samples or plant samples.

Bertha armyworm numbers are so low that we could not find a site to gather data for that insect and all indications are that it will remain that way for 2016 the final year of the project. Staffing will remain the same as in 2015 with the addition of another technician will be added to cover off the Edmonton region in 2016.

Insects in Alfalfa. In 2015 we cut back the number of fields surveyed from 150 to 100. Our criteria for reducing fields from this study included: fields coming out of production, poor stand or fields with 20% or more dandelion. We have a new technician, Kathrin Sim, processing the samples. Kathrin is doing a very thorough job. We expect to have the samples processed by April 1. Kathrin has found some very interesting insects. We are sending insects to Ottawa for identification and adding to the national records.

As an adjunct to this study we are looking at paired fields of alfalfa and lygus to determine if lygus move from alfalfa to canola when the field is cut for hay. This involved weekly sweep net samples from both the canola and alfalfa. Most of these samples are processed.

Communications:

Alberta Insect Monitoring Network. <agriculture.alberta.ca/bugs-pest> serves as a focal point to access current insect information and is the center of our communication. Every effort is made to make it dynamic and seasonally topical. Our page has prompted other programs in the Pest Surveillance Branch to copy it or look to copy it. This is the home of the forecast maps.

Call of the Land Alberta Agriculture's daily radio program plays a major role in our communications. Recent surveys indicate that producers spend at least 10 hours a week listening to the radio. From May til September, weekly interviews present issues in the crop insect world. The insect updates air on Thursdays.

You Tube presentations can be found on the Alberta Agriculture and Forestry You Tube channel: *Assembling a Bertha Armyworm trap*;

Assembling the Diamondback Moth Trap; Field Scouting for Bertha Armyworm; Proper Sweepnet Technique for Cabbage Seed Pod Weevil; Sweeping Canola for Lygus Bugs; Assembling a Wheat Midge Trap and Assembling a Swede Midge Trap.

We also link these videos from our web page during the growing season. We are planning to film a *How to Scout Wheat Midge* in the summer of 2016.

Email lists The email list has continued to grow with more agronomists, researchers, Alberta Agriculture and Forestry staff and farmers signing on to receive email updates from the Pest Surveillance Branch. This will continue to be an important part of the communications plan in the coming year.

Input from our advisory committee has changed how the subject line is written and we strive to keep the reading to a minimum with links to further information about the subject. Also upon recommendation from the advisory committee, the email comes as issues arise in the field so we keep people current with insect, disease and weed issues.

Twitter @ABbugcounter now has 2471 followers! From May to August there were 645 Twitter conversations. 425 Tweets were about insect identification. In 2015, we talked about how powerful a surveillance tool Twitter could be and that is true as Twitter was how we found out about the wheat stem sawfly cutting in Flagstaff county.

#Abbugchat is a weekly (Wednesday at 10:00 AM) tweet chat that allows for conversations around crop insects that is robust and productive. This method of communication is like being in a virtual coffee shop where the conversation flows both ways. We have a strong core of weekly followers who provide field-based observations and ask important questions.

In 2015 we had on two different occasions special guests, Jennifer Otani and Dan Johnson, join the Tweetchat. This seemed to work well and will be repeated in 2016. Lastly Tweetchat is valuable to provide current information that can be used on Call of the Land. Tweetchats are archived on Storify.

Insect Images the image catalogue is growing. Images from this program have been used in presentations, on the web page and in the Agriculture and Agri-Food Canada publication *Field Crop and Forage Pests and their Natural Enemies in Western Canada*. Images are also used in #Abbugchat.

Meetings. We always go out of our way to resource meetings, workshops and field days of our cooperators. It is a good way of building a positive working relationship.

Staff

- Scott Meers, Insect Management Specialist
- Shelley Barkley, Insect Technologist
- Heather Leibel, Technologist (10 months) left in September
- Kathrin Sim, Technologist (until April 2017) replaced Heather
- Justina Nibourg (4 months - summer)
- Hailey Rasmussen (4 months - summer)
- Sam White (4 months - summer)