



Prairie Pest Monitoring Network Weekly Updates – August 15, 2018 **Otani, Weiss, Giffen, Vankosky, Svendsen, Olfert**

1. Greetings! Harvest is underway in parts of the prairies this week. Access the complete Weekly Update either as a [series of Posts for Week 15 \(August 16, 2018\)](#) and review the "[Insect of the Week](#)" for Week 15!

Have questions or problems accessing the contents of this Weekly Update? Please e-mail either [Dr. Meghan Vankosky](#) or [Jennifer Otani](#). Past "Weekly Updates" can be accessed in a downloadable PDF format on our [Weekly Update page](#).

[Subscribe to the Blog](#) by following these three steps!

2. Weather synopsis – This week, weather data is unavailable due to technical difficulties so we are unable to generate several maps. Please check webpages posted by [Environment Canada](#) or the Drought Watch webpages posted by [Agriculture and Agri-Food Canada](#) for updates.

Review the [Weather synopsis for Week 13](#).

Weather forecasts (7 day):

Winnipeg: https://weather.gc.ca/city/pages/mb-38_metric_e.html

Brandon: https://weather.gc.ca/city/pages/mb-52_metric_e.html

Saskatoon: https://weather.gc.ca/city/pages/sk-40_metric_e.html

Regina: https://weather.gc.ca/city/pages/sk-32_metric_e.html

Edmonton: https://weather.gc.ca/city/pages/ab-50_metric_e.html

Lethbridge: https://weather.gc.ca/city/pages/ab-30_metric_e.html

Grande Prairie: https://weather.gc.ca/city/pages/ab-31_metric_e.html

3. Pre-Harvest Interval (PHI) - Growers with late-season insect pest problems must factor in the PHI which is the minimum number of days between a pesticide application and swathing or straight combining of a crop.

The PHI recommends sufficient time for a pesticide to break down and a PHI-value is both crop- and pesticide-specific. Adhering to the PHI is important for a number of health-related reasons but also because Canada's export customers strictly regulate and test for the presence of trace residues of pesticides.

An excellent summary of PHI for various pesticides in their various crops was posted by Saskatchewan Agriculture's Danielle Stephens in 2016 within their [Crop Production News](#).

In 2013, the Canola Council of Canada created and circulated their "[Spray to Swath Interval Calculator](#)" to help canola growers accurately estimate their PHI. Other PHI are described in your provincial crop protection guides and remember that specific crop x pesticide combinations will mean different PHIs.

Finally, work towards "Keeping It Clean" so your grain is ready for export! More information about PHI and Maximum Residue Limits (MRL) is available on the [Keeping It Clean](#) site.

4. Bertha armyworm (Lepidoptera: *Mamestra configurata*) - Pheromone trapping across the prairies is almost complete for the 2018 growing season but **now it is important to scout for larvae feeding on leaves and developing pods!**

Review your province's 2018 bertha armyworm pheromone trapping results towards the end of this segment.



Monitoring:

- Larval sampling should commence once the adult moths are noted.
- Sample at least three locations, a minimum of 50 m apart.
- At each location, mark an area of 1 m² and beat the plants growing within that area to dislodge the larvae.
- Count them and compare the average against the values in the economic threshold table below:

Table 1. Economic thresholds for Bertha armyworm in canola (courtesy Manitoba Agriculture, Food and Rural Initiatives).

Spraying cost – \$ / acre	Expected Seed Value - \$ / bushel ¹										
	6	7	8	9	10	11	12	13	14	15	16
	Number of Larvae / metre ² *										
7	20	17	15	13	12	11	10	9	9	8	8
8	23	20	17	15	14	13	11	11	10	9	9
9	26	22	19	17	16	14	13	12	11	10	10
10	29	25	22	19	17	16	14	13	12	11	11
11	32	27	24	21	19	17	16	15	14	13	12
12	34	30	26	23	21	19	17	16	15	14	13
13	37	32	28	25	22	20	19	17	16	15	14
14	40	35	31	27	24	22	20	19	17	16	15
15	43	37	32	29	26	23	22	20	19	17	16

* Economic thresholds for bertha armyworm are based on an assumed yield loss of 0.058 bu/acre for each larva/metre² (Bracken and Bucher. 1977. Journal of Economic Entomology. 70: 701-705).

Scouting tips:

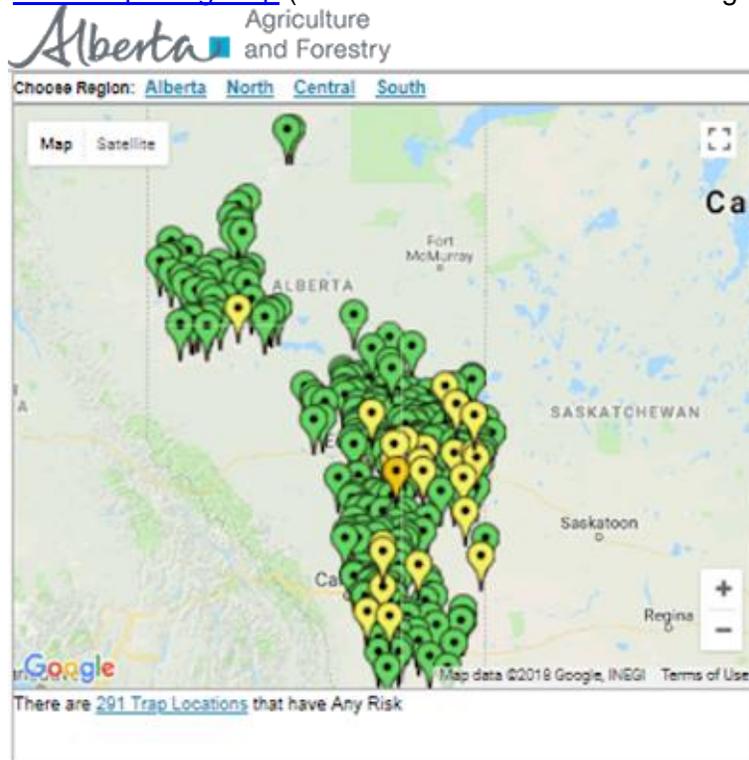
- Some bertha armyworm larvae remain green or pale brown throughout their larval life.
- Large larvae may drop off the plants and curl up when disturbed, a defensive behavior typical of cutworms and armyworms.
- Young larvae chew irregular holes in leaves, but normally cause little damage. The fifth and sixth instar stages cause the most damage by defoliation and seed pod consumption. Crop losses due to pod feeding will be most severe if there are few leaves.
- Larvae eat the outer green layer of the stems and pods exposing the white tissue.
- At maturity, in late summer or early fall, larvae burrow into the ground and form pupae.



The BAW larva has six instar stages and passes through color phases of green and pale brown before becoming a large black caterpillar measuring 4-5 cm long. Photo: AAFC-Saskatoon



Albertans can access the [online reporting map](#) (screenshot below retrieved 14Aug2018 for reference):

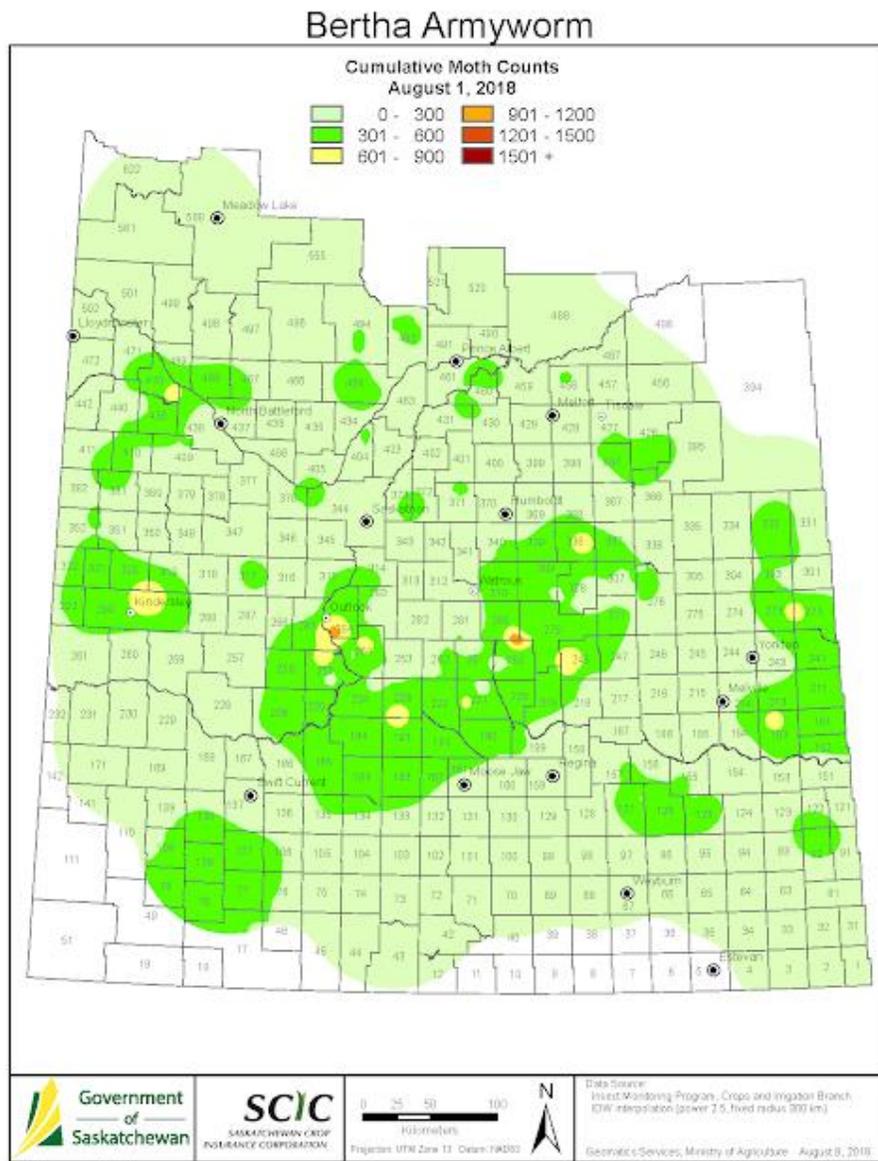


Legend

Cumulative Number of Moths/Trap		Larval Infestation Risk Level	
From	To	Color	Description
0	300	Green	Low - Infestations are unlikely to be widespread, but fields should be inspected for signs of insects or damage.
300	900	Yellow	Medium - Infestations may not be widespread, but fields that were particularly attractive to egg-laying females could be infested. Check your fields.
900	1200	Orange	High - Canola fields should be sampled regularly for larvae and for evidence of damage.
1200	1500+	Red	Severe - Canola fields should be sampled frequently for larvae and for evidence of damage.



Saskatchewan growers can check the [2018 bertha armyworm map](#) (screenshot below retrieved 01Aug2018 for reference):





Manitoban growers can find bertha armyworm updates in that province's [Insect and Disease Updates](#). A screen shot of that summary (retrieved 01Aug2018) is pasted below:

Bertha Armyworm: Out of ninety-nine traps, 87 currently have cumulative counts in the low risk category (less than 300), one trap is in the moderate risk range, and 11 traps are in the uncertain risk category. Most of the highest cumulative counts so far are in the western part of Manitoba. Traps counts in eastern Manitoba and the Interlake have generally been quite low.

Table 1. Highest cumulative trap counts for bertha armyworm adults over the trapping period June 3 to July 24, 2018.

0-300=low risk 300-900=uncertain risk 900-1,200=moderate risk 1,200+=high risk

Location	Region	Count	Risk
Tilston	Southwest	970	Moderate
Somerset	Central	490	Uncertain
Pierson	Southwest	469	Uncertain
Swan River	Northwest	414	Uncertain
Bowsman	Northwest	404	Uncertain
Inglis	Northwest	402	Uncertain
Mather	Central	358	Uncertain
Russell	Northwest	344	Uncertain
Benito	Northwest	343	Uncertain
Kenville	Northwest	342	Uncertain
Inglis	Northwest	342	Uncertain
Benito	Northwest	307	Uncertain

This trapping provides information on the regional risk of bertha armyworm potentially getting to higher levels of larvae. The trap counts have little relevance for the field the trap is in, but assessing the traps captures from the various traps in a region can indicate the risk and importance of sampling levels of larvae in a region. At no point should a management decision be made based on trap counts. Such decisions need to be made based on levels of larvae.

While scouting canola, assessing levels of bertha armyworm larvae is encouraged, particularly in the western part of Manitoba where a few traps have reached the uncertain and moderate risk range.

A reminder for those monitoring traps that this is the last week for trap counts. Once counts are done for this week (July 23 to 27) the traps can be pulled.

Biological and monitoring information related to bertha armyworm in field crops is posted by the provinces of [Manitoba](#), [Saskatchewan](#), [Alberta](#) and the [Prairie Pest Monitoring Network](#). Also refer to the [bertha armyworm pages](#) within the new "Field Crop and Forage Pests and their Natural Enemies in Western Canada: Identification and management field guide" - both [English-enhanced](#) or [French-enhanced](#) versions are available.



5. Lygus bugs (*Lygus* spp.) – The economic threshold for Lygus in canola is applied at late flower and early pod stages.



Adult *L. lineolaris* (5-6 mm long) (photo: AAFC-Saskatoon).



Fifth instar lygus bug nymph (3-4 mm long) (photo: AAFC-Saskatoon).

Damage: Lygus bugs have piercing-sucking mouthparts and physically damage the plant by puncturing the tissue and sucking plant juices. The plants also react to the toxic saliva that the insects inject when they feed. Lygus bug infestations can cause alfalfa to have short stem internodes, excessive branching, and small, distorted leaves. They feed on buds and blossoms and cause them to drop. They also puncture seed pods and feed on the developing seeds causing them to turn brown and shrivel.

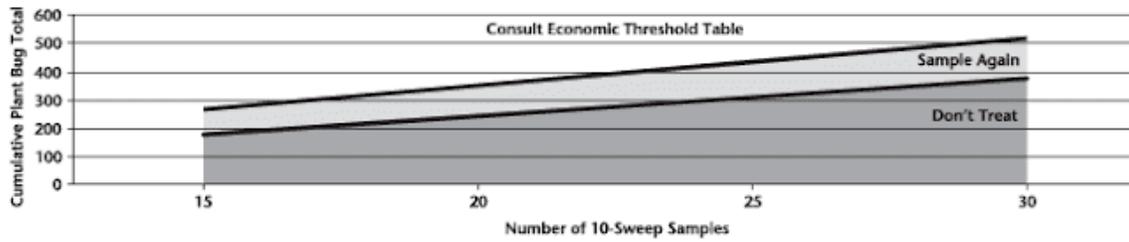
Scouting tips to keep in mind:

Begin monitoring canola when it bolts and continue until seeds within the pods are firm. Since adults can move into canola from alfalfa, check lygus bug numbers in canola when nearby alfalfa crops are cut.

Sample the crop for lygus bugs on a sunny day when the temperature is above 20°C and the crop canopy is dry. With a standard insect net (38 cm diameter), take ten 180° sweeps. Count the number of lygus bugs in the net.

Sampling becomes more representative IF repeated at multiple spots within a field. For lygus bug monitoring, sampling is most accurate when repeated at a total of 15 spots within the field. Samples can be taken along or near the field margins. Calculate the cumulative total number of lygus bugs and then consult the sequential sampling chart (Figure C).

If the total number is below the lower threshold line, no treatment is needed. If the total is below the upper threshold line, take more samples. If the total is on or above the upper threshold line, calculate the average number of lygus bugs per 10-sweep sample and consult the economic threshold table.



Sequential sampling for lygus bugs at late flowering stage in canola.

The **economic threshold for lygus bugs in canola** covers the end of the flowering (Table 1) and the early pod ripening stages (Table 2). Once the seeds have ripened to yellow or brown, the cost of controlling lygus bugs may exceed the damage they will cause prior to harvest, so insecticide application is not warranted.

Consider the estimated cost of spraying and expected return prior to making a decision to treat a crop.

Remember that insecticide applications at bud stage in canola have not been proven to result in an economic benefit in production. The exception to this is in the Peace River region where early, dry springs and unusually high densities of lygus bug adults can occasionally occur at bud stage. In this situation, high numbers of lygus bugs feeding on moisture-stressed canola at bud stage is suspected to result in delay of flowering so producers in that region must monitor in fields that fail to flower as expected.

Table 1. Economic thresholds for lygus bugs in canola at late flowering and early pod stages (Wise and Lamb 1998).

Control costs		Late flower to early pod (Canola crop stages 4.4-5.1 ¹)						
\$/ac	\$/ha	Economic Injury Level ²						
\$8.00	\$19.77	8	6	5	4	4	3	3
\$10.00	\$24.71	10	8	7	6	5	4	4
\$12.00	\$29.65	12	9	8	7	6	5	5
\$14.00	\$34.59	14	11	9	8	7	6	5
\$16.00	\$39.54	16	13	10	9	8	7	6
\$18.00	\$44.48	18	14	12	10	9	8	7
\$20.00	\$49.42	20	16	13	11	10	9	8
Canola value	\$/bu	\$8.00	\$10.00	\$12.00	\$14.00	\$16.00	\$18.00	\$20.00
	\$/tonne	\$352.42	\$440.53	\$528.63	\$616.74	\$704.85	\$792.95	\$881.06

1 Canola crop stage estimated using Harper and Berkenkamp 1975).

2 Economic thresholds are based on an assumed loss of 0.1235 bu/ac per lygus bug caught in 10 sweeps (Wise and Lamb. 1998. The Canadian Entomologist. 130: 825-836).

Table 2. Economic thresholds for lygus bugs in canola at pod stage (Wise and Lamb 1998).

Control costs		Early pod (Canola crop stages 5.2 ¹)						
\$/ac	\$/ha	Economic Injury Level ³						
\$8.00	\$19.77	11	9	7	6	5	5	4
\$10.00	\$24.71	14	11	9	8	7	6	5
\$12.00	\$29.65	16	13	11	9	8	7	7
\$14.00	\$34.59	19	15	13	11	10	9	8
\$16.00	\$39.54	22	18	15	13	11	10	9
\$18.00	\$44.48	25	20	16	14	12	11	10
\$20.00	\$49.42	27	22	18	16	14	12	11
Canola value	\$/bu	\$8.00	\$10.00	\$12.00	\$14.00	\$16.00	\$18.00	\$20.00
	\$/tonne	\$352.42	\$440.53	\$528.63	\$616.74	\$704.85	\$792.95	\$881.06

3 Economic thresholds are based on an assumed loss of 0.0882 bu/ac per lygus bug caught in 10 sweeps (Wise and Lamb. 1998. The Canadian Entomologist. 130: 825-836).



Biological and monitoring information related to *Lygus* in field crops is posted by the provinces of [Manitoba](#) or [Alberta](#) fact sheets or the Prairie Pest Monitoring Network's [monitoring protocol](#). Also refer to the [Lygus pages](#) within the new "Field Crop and Forage Pests and their Natural Enemies in Western Canada: Identification and management field guide" - both [English-enhanced](#) or [French-enhanced](#) versions are available.

6. Thrips in canola (*Thysanoptera*) – While scouting at this time of year, curled canola pods may be encountered. The culprits are quite possibly thrips.



Thrips damage observed in canola in the northeast of Saskatchewan in July 2016 (Photo: AAFC-Saskatoon, Olfert 2016).

Damage: Flower thrips (*Thysanoptera*) are pests of a broad range of plants including cereals and broadleaved crops such as canola. Thrips are minute, slender-bodied insects with rasping-sucking mouthparts and feed by rasping the surface of canola buds and sucking up plant fluids.

Biology: Thrips have six life stages: egg, two larval stages, a prepupal and pupal stage and an adult. Both adults and nymphs cause damage by feeding on the flower and buds. Limited surveys in 1999 in Saskatchewan and Alberta indicated that the predominant species were *Frankliniella tritici* (flower thrip) followed by *Thrips tabaci* (onion thrip) and *T. vulgatissimus* (no common name).

In canola, pods damaged by thrips are often curled and tend to drop prematurely. Some species, such as *T. vulgatissimus* have been credited with contributing to pollination.



Curled pods of canola caused by thrips feeding damage (Photos: AAFC-Saskatoon, Olfert et al. 1998)



Read more about thrips in canola by accessing this article by [Olfert et al. 1998](#)).

7. Flea Beetles (Chrysomelidae: *Phyllotreta* species) – By early pod stages in canola, newly eclosed adult flea beetles begin to emerge from the soil. These individuals typically feed then move away from canola fields to locate overwintering habitats.

Normally, it can be difficult to locate these newly emerged adults but every few years they are easily observed among canola pods. These adults can feed on upper leaves and nip at the exterior of canola pods but are



typically observed in low densities - too low to cause economic damage. Even so, be watchful - areas with high numbers of flea beetles late in the growing season are worthwhile to scout early in 2019.

Remember - the **Action Threshold for flea beetles on canola is 25% of COTYLEDON LEAF AREA consumed.**

Normally, it is NOT recommended to apply foliar insecticides for flea beetles in canola during the pod stages for the following reasons:

- Flea beetles are very mobile at this point in the season,
- Canola canopy is very thick,
- Growers must be cautious about pre-harvest intervals,
- PLUS, little is understood about overwintering survival of this pest!

Reminder - Earlier this season, the [Insect of the Week](#) featured flea beetles!

Refer to the [flea beetle page](#) from the "Field Crop and Forage Pests and their Natural Enemies in Western Canada: Identification and management field guide" as an [English-enhanced](#) or [French-enhanced](#) version.

8. Ladybird beetles (Coleoptera: Coccinellidae) - While scouting, you may encounter these fascinating organisms.....



Figure 1. Ladybird beetle larva (photo credit: AAFC-Beaverlodge)



Figure 2. Ladybird beetle pupa (Left) and larva (Right) (photo credit: AAFC-Beaverlodge)



Figure 3. Ladybird beetle pupa (photo credit: AAFC-Beaverlodge)



Figure 4. Ladybird beetle (*Coccinella septempunctata*) (photo credit: AAFC-Beaverlodge)



Figure 5. Aphids nestled on wheat head (photo credit: AAFC-Beaverlodge)



Figure 6. An aphid "mummy" adhered to a wheat awn. Mummy is the aphid host converted to enclose a soon-to-emerge parasitoid wasp (photo credit: AAFC-Beaverlodge)

Ladybird beetle larvae (Fig. 1-2), pupae (Fig. 2-3), and adults (Fig. 4) can all be found in fields at this time of year. Take a look at the various stages and the [many patterns of native and introduced species](#) to recognize these as [Field Heroes!](#) Ladybird beetles are categorized as [general predators](#) and will feed on several species of arthropods but are partial to aphids (Fig. 5).

9. Harvest Sample Program - The Canadian Grain Commission is ready and willing to grade grain samples harvested in 2018. Samples are accepted up to November but send samples as soon a harvest is complete.

This is a FREE opportunity for growers to gain unofficial insight into the quality of their grain and to obtain valuable dockage information and details associated with damage or quality issues. The data collected also helps Canada market its grain to the world!

More information on the [Harvest Sample Program](#) is available at the Canadian Grain Commission's website where growers can register online to receive a kit to submit their grain.

In exchange for your samples, the CGC assesses and provides the following unofficial results FOR FREE:

- dockage assessment on canola
- unofficial grade
- protein content on barley, beans, chick peas, lentils, oats, peas and wheat
- oil, protein and chlorophyll content for canola



- oil and protein content and iodine value for flaxseed
- oil and protein for mustard seed and soybeans
- NEW for 2018-19: Participants will receive Falling Number and deoxynivalenol (DON) results for their wheat samples at no cost. This enhancement to the Harvest Sample Program is the first initiative to be funded by the Canadian Grain Commission's accumulated surplus.

Many producers find having both grade and quality information on their samples before delivering their grain to be helpful.

10. Stored Product Pests - The Canadian Grain Commission's website has an [online key to stored product pests](#). Growers managing grain storage can find an online identification tool for stored product pests (e.g., [Rusty grain beetle](#), [Red flour beetle](#), [Confused flour beetle](#), [Saw-toothed grain beetle](#), and more). The online tool features excellent diagnostic photos. A screen shot of the webpage is included below for reference.

The screenshot shows the Canadian Grain Commission website. The header includes the Government of Canada logo and navigation links for 'Canada.ca', 'Services', 'Departments', and 'Français'. The main navigation bar lists 'All topics', 'Services and fees', 'Forms', 'Directives', and 'Grains of Canada'. The breadcrumb trail reads: 'Home > Storage, handling and delivery > Manage stored grain > Insect identification keys'. The left sidebar contains a tree view of categories: 'Storage, handling and delivery', 'Manage stored grain', 'Identify an insect', 'Primary insect pests', 'Secondary insect pests', 'Eight common insect pests', 'Insect identification keys', 'Insect pest biology', 'Glossary of insect terminology', 'Control grain insect pests', 'Manage storage to prevent infestations', and 'Guides'. The main content area is titled 'Insect identification keys' and includes a sub-section 'How to use an insect key' with explanatory text and two images of beetles. The text explains that an insect key is a tool used to determine the species of a given insect, typically designed as dichotomous or paired couplets. It also mentions that a user chooses which option best matches the insect being identified, leading to another couplet until a final couplet identifies the insect. The text further notes that understanding insect morphology helps in using the key effectively and that a glossary of insect terms is available. The two images are labeled 'Stored product beetles found in Canada' and 'Stored grain pests found in Canada'. Below the images, the text states 'Simple and comprehensive keys' and lists two keys available: a simple key for commonly found adult insects associated with stored grain in Canada, and a comprehensive key for adult beetles found in stored products, including grain, in Canada and worldwide. The page footer includes 'Terms and conditions | Transparency' and 'Date modified: 201310-01'.

11. Provincial entomologists provide insect pest updates throughout the growing season so we link to their most recent information:

- **Manitoba's** Insect and Disease Updates for 2018 can be [accessed here](#). [Issue #11](#) (posted August 8, 2018) includes initial reports of very low levels of soybean aphids and reports of bertha armyworm in canola fields in western Manitoba yet few fields exceeding economic levels. Agronomists in southwest Manitoba reported "melting" bertha armyworm larvae-read more to learn how insect-specific viruses are at work in fields! Finally, a reminder that the annual grasshopper survey is underway in August.



- **Saskatchewan's** Crop Production News for 2018 is posted with [Issue #6](#) now available. This issue informs growers that Ministry staff will be in fields [conducting surveys](#). A reminder to [manage pre-harvest intervals](#) plus read the article describing disease and insect culprits associated with [white heads in cereals](#).
- **Alberta** Agriculture and Forestry's [Call of the Land](#) regularly includes insect pest updates from Scott Meers. The most recent Call of the Land (posted [August 9, 2018](#)) includes reports of the bertha armyworm in Birch Hills county, the expected appearance of red turnip beetles which feed, mate and lay eggs at this point in the growing season, relatively low numbers of diamondback moths but a reminder to scout in canola at early pod stages, and peculiar behaviours of parasitized ladybird beetles and grasshoppers.

12. Crop reports are produced by:
- Manitoba Agriculture ([August 13, 2018](#))
 - Saskatchewan Agriculture ([July 31-August 6, 2018](#))
 - Alberta Agriculture and Forestry Crop Report ([August 7, 2018](#))

The following crop reports are also available:

- The United States Department of Agriculture (USDA) produces a [Crop Progress Report](#) (view the [August 13, 2018](#) edition).
- The USDA's [Weekly Weather and Crop Bulletin](#) (view the [August 7, 2018](#) edition).

13. **Insect of the Week** – This week's [Insect of the Week](#) is the twospotted spider mite. This tiny mite is 0.5 mm long and has eight legs. It has a greenish, yellowish to orange oval body with two dark spots on its abdomen. To the unaided eye, it looks like a small speck. they feed on corn, soybean, dry beans, alfalfa, vegetables and fruit.

These mites overwinter in protected sites as eggs, immatures or adults depending on food hosts and habitat. Immatures and adults move to emerging plant hosts in the spring. They create webbing on the underside of leaves where they puncture cells to feed on cell contents. This feeding causes stippling, yellowing or browning of the leaves. Leaves may dry and drop which can further reduce crop yields.

Infestations start at the field edge and move inwards. Extended hot, dry conditions favour rapid population build up and exacerbate feeding injury.

For more information on the twospotted spider mite, check out our [Insect of the Week](#) page!



Twospotted spider mite – adult closeup
David Cappaert, Michigan State University, Bugwood.org



Twospotted spider mite - stippling damage on bean
Whitney Cranshaw, Colorado State University, Bugwood.org

14. Previous Posts - The following is a list of 2018 Posts - click to review:

[Abundant parasitoids in canola](#) - Week 10

[Alfalfa weevil](#) - Week 6

[Aphid App](#) - Week 12

[Cabbage seedpod weevil](#) - Week 12

[Cabbage root maggot](#) - Week 11

[Cereal aphid manager \(CAM\)](#) - Week 2

[Cereal leaf beetle](#) - Week 13

[Cereal leaf beetle larvae request](#) - Week 8

[Crop protection guides](#) - Week 2

[Cutworms](#) - Week 4

[Diamondback moth](#) - Week 7

[Download the field guide](#) - Week 10

[Field heroes](#) - Week 8

[Flea beetles](#) - Week 4

[Grasshopper simulation model output](#) - Week 13

[Monarch migration](#) - Week 8

[Pea leaf weevil](#) - Week 13

[PMRA Pesticide Label Mobile App](#) - Week 4

[Scouting charts](#) (canola and flax) - Week 3

[Ticks and Lyme Disease](#) - Week 4

[Weather synopsis](#) - Week 13

[Weather radar](#) - Week 3

[West Nile virus risk](#) - Week 13

[Wheat midge](#) - Week 12



[White grubs in fields](#) - Week 8

[Wind trajectories](#) - Week 6

[Wireworm distribution maps](#) - Week 6