1. Greetings! Subscribe to the Blog by following the instructions posted here or bookmark the url located at: http://prairiepestmonitoring.blogspot.ca/

2. Weather synopsis – This past week’s temperatures were above normal in many locations on the prairies, especially south and central Alberta and Saskatchewan (Fig. 1).

![Figure 1. Highest temperatures across the Canadian prairies the past seven days (July 25-31, 2017).](image-url)
Seven-day rainfall accumulations were low across the prairies. Total 30-day rainfall accumulations indicate that conditions are normal to dryer-than-normal for most of the prairies (Fig. 2). Growing season (April 1 – July 31, 2017) percent of average precipitation continues to be average for some areas of Alberta, but below average for most of Saskatchewan and Manitoba.

Figure 2. Percent of average precipitation across the Canadian prairies the past 30 days (July 2-31, 2017).

Figure 3. Percent of average precipitation across the Canadian prairies over the growing season (April 1-July 31, 2017).
The growing degree day map (GDD) (Base 10°C, March 1 – July 30, 2017) is below:

The maps above are all produced by Agriculture and Agri-Food Canada. Growers may wish to bookmark the AAFC Drought Watch Maps for the growing season.
3. Pre-Harvest Interval (PHI) - Growers with late-season insect pest problems will need to remember to 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” which was intended 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. More information about PHI and Maximum Residue Limits (MRL) is available on the Canola Council of Canada's website.

4. Crop Protection Guides – If you don’t have a copy of your province’s Crop Protection Guide, please make use of these links to access:
   - Saskatchewan’s Crop Protection Guide
   - Manitoba’s Guide to Crop Protection Guide
   - Alberta’s Crop Protection or Blue Book
   - Western Committee on Crop Pests Guidelines for the Control of Crop Pests

Recall earlier this spring that Health Canada’s Pest Management Regulatory Agency launched a new mobile app to access pesticide labels registered for use in Canada. The App helps homeowners, farmers, industry, provincial and federal organizations access details for pest control products from a smartphone or tablet. Download it as either:

   - iOS for iPhone/iPod Touch in English,
   - iOS for iPhone/iPod Touch in French,
   - Android smartphone in English,
   - Android smartphone in French,
   - Android smartphone (Amazon) in English,
   - Android smartphone (Amazon) in French.

5. Diamondback moth (Plutellidae: Plutella xylostella) – Last week, biofix dates were used to predict the number of generations of DBM as of July 24, 2017. That data predicted the completion of two generations of DBM across the Canadian prairies. The number of generations, combined with the recent heat, has resulted in densities of DBM above threshold in some fields this week! In-field scouting is critical and necessary to protect developing pods since DBM larvae will feed on the exterior which can render pods prone to shattering even in high temperatures and high winds or during swathing and direct-harvesting.

REMINDER - Once diamondback moth is present in the area, it is important to monitor individual canola fields for larvae. Remove the plants in an area measuring 0.1 m² (about 12" square), beat them on to a clean surface and count the number of larvae (Fig. 4) dislodged from the plant. Repeat this procedure at least in five locations in the field to get an accurate count. The economic threshold for diamondback moth in canola at the advanced pod stage is 20 to 30 larvae/0.1 m² (approximately 2-3 larvae per plant). Economic thresholds for canola or mustard in the early flowering stage are not available. However, insecticide applications are likely required at larval densities of 10 to 15 larvae/0.1 m² (approximately 1-2 larvae per plant).
Figure 4. Diamondback larva measuring ~8mm long. Note brown head capsule and forked appearance of prolegs on posterior.

Figure 5. Diamondback moth pupa within silken cocoon.

Biological and monitoring information for DBM is posted by Manitoba Agriculture, Food and Rural Development, Saskatchewan Agriculture, Alberta Agriculture and Forestry, and the Prairie Pest Monitoring Network.

More information about Diamondback moths can be found by accessing the pages from the new "Field Crop and Forage Pests and their Natural Enemies in Western Canada: Identification and Field Guide". View ONLY the Diamondback moth page but remember the guide is available as a free downloadable document as both an English-enhanced or French-enhanced version.

Figure 6. Diamondback moth.

Across the prairies, provincial staff coordinate diamondback pheromone trapping during the growing season:
- Low numbers of moths have been reported across Saskatchewan for the 2017 pheromone monitoring.
- Manitoba Agriculture and Rural Initiatives posted low DBM counts which can be reviewed here.
- Alberta Agriculture and Forestry has a live 2016 map reporting Diamondback moth pheromone trap interceptions. A copy of the map (retrieved July 20, 2017) is below for reference.
6. Bertha armyworm (Lepidoptera: *Mamestra configurata*) - Reporting sites across the prairies have generally reported lower cumulative interceptions and cumulative counts are summarized by provincial staff in Manitoba, Saskatchewan and Alberta.

**Manitoba counts as of July 26, 2017**

Risk Forecast for Bertha Armyworm in Manitoba in 2017

The population of adult moths of bertha armyworms are monitored using pheromone-baited traps during the flight and egg-laying period. The monitoring period extends from about mid-June through July.

The cumulative moth counts from the traps, which is presented in the table below, can not predict what levels of larvae will be, but can be used to determine areas of the province where increased monitoring of fields for larvae may be necessary.

![Figure 1](image1.png)  ![Figure 2](image2.png)

**Figure 1. Trap for monitoring bertha armyworm.**  **Figure 2. Bertha armyworm moths.**

**Summary**

Most cumulative trap counts for bertha armyworm are currently in the low risk range (less than 300) for larvae of bertha armyworms being at economic levels. Out of 90 traps, 4 traps have cumulative counts greater than 300, placing them in the uncertain risk category, the rest are in the low risk category. The highest cumulative trap count so far is 479 from a trap near Benito in northwest Manitoba.

<table>
<thead>
<tr>
<th>Location</th>
<th>Count</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northwest</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benito</td>
<td>479</td>
<td>Uncertain</td>
</tr>
<tr>
<td>Dugald</td>
<td>355</td>
<td>Uncertain</td>
</tr>
<tr>
<td>Benito</td>
<td>319</td>
<td>Uncertain</td>
</tr>
<tr>
<td>Benito</td>
<td>273</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Southwest</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilston</td>
<td>379</td>
<td>Uncertain</td>
</tr>
<tr>
<td>Napioka</td>
<td>287</td>
<td>Low</td>
</tr>
<tr>
<td>Lenore</td>
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<td>Low</td>
</tr>
<tr>
<td>Minnedosa</td>
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<td>Low</td>
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<td><strong>Central</strong></td>
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<td></td>
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<tr>
<td>Pilot Mound</td>
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<td>Low</td>
</tr>
<tr>
<td>Glenboro</td>
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<td>Low</td>
</tr>
<tr>
<td>Somerset</td>
<td>177</td>
<td>Low</td>
</tr>
<tr>
<td>Notre Dame</td>
<td>111</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Eastern</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourollo</td>
<td>30</td>
<td>Low</td>
</tr>
<tr>
<td>Blumenort</td>
<td>10</td>
<td>Low</td>
</tr>
<tr>
<td>Lockport</td>
<td>2</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Interlake</strong></td>
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<td></td>
</tr>
<tr>
<td>Stony Mountain</td>
<td>95</td>
<td>Low</td>
</tr>
<tr>
<td>Grosse Isle</td>
<td>30</td>
<td>Low</td>
</tr>
<tr>
<td>Stonewall</td>
<td>23</td>
<td>Low</td>
</tr>
</tbody>
</table>
Saskatchewan map as of July 19, 2017

Bertha Armyworm

Cumulative Moth Counts
July 19, 2017

- 0 - 30
- 301 - 600
- 601 - 900
- 901 - 1500
- 1501 +

Data Source: Crop Monitoring Program, Crop and Insect Branch

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Alberta map as of July 26, 2017
In-field monitoring for egg masses and newly emerged larvae (photo below) should initially focus on the undersides of leaves plus watch the margins of leaves for feeding. Bertha armyworm larvae will also feed on newly developing pods so the whole plant should be examined. Watch for the following life stages:

**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.

**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).

<table>
<thead>
<tr>
<th>Spraying cost – $ / acre</th>
<th>Expected Seed Value - $ / bushel†</th>
<th>Number of Larvae / metre²*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6  7  8  9  10  11  12  13  14  15  16</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>20 17 15 13 12 11 10 9 8 8 8</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>23 20 17 15 14 13 11 10 9 9 9</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>26 22 19 17 16 14 13 12 11 10 10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>29 25 22 19 17 16 14 13 12 11 11</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>32 27 24 18 17 16 15 14 13 12 12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>34 30 26 23 21 19 17 16 15 14 12</td>
<td></td>
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<tr>
<td>13</td>
<td>37 32 28 25 22 20 19 17 16 15 14</td>
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<td>40 35 31 27 24 22 20 19 17 16 15</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>43 37 32 29 26 23 22 20 19 17 16</td>
<td></td>
</tr>
</tbody>
</table>

* 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).

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.

7. Lygus bugs (Lygus spp.) - Reminder - 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).](image1)

![Fifth instar lygus bug nymph (3-4 mm long) (photo: AAFC-Saskatoon).](image2)
**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.

**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.

Repeat the sampling in another 14 locations. 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 chart](chart.png)

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).

<table>
<thead>
<tr>
<th>Control costs</th>
<th>Early flower to early pod (Canola crop stages 4.4.5.1)</th>
<th>Economic Injury Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/ac</td>
<td>$/ha</td>
<td></td>
</tr>
<tr>
<td>$8.00</td>
<td>$19.77</td>
<td>8</td>
</tr>
<tr>
<td>$10.00</td>
<td>$24.71</td>
<td>10</td>
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<tr>
<td>$12.00</td>
<td>$29.65</td>
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<td>$18.00</td>
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<td>18</td>
</tr>
<tr>
<td>$20.00</td>
<td>$49.42</td>
<td>20</td>
</tr>
</tbody>
</table>

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

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).

<table>
<thead>
<tr>
<th>Control costs</th>
<th>Early pod (Canola crop stages 5.2)</th>
<th>Economic Injury Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/ac</td>
<td>$/ha</td>
<td></td>
</tr>
<tr>
<td>$8.00</td>
<td>$19.77</td>
<td>8</td>
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<tr>
<td>$10.00</td>
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<td>18</td>
</tr>
<tr>
<td>$20.00</td>
<td>$49.42</td>
<td>20</td>
</tr>
</tbody>
</table>

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.

8. Cabbage seedpod weevil (Ceutorhynchus obstrictus) - There is one generation of CSPW per year and the overwintering stage is the adult which is an ash-grey weevil measuring 3-4mm long (Refer to lower left photo). Adults typically overwinter in soil beneath leaf litter within shelter belts and roadside ditches.
Monitoring:
- Begin sampling when the crop first enters the bud stage and continue through the flowering.
- Sweep-net samples should be taken at ten locations within the field with ten 180° sweeps per location.
- Count the number of weevils at each location. Samples should be taken in the field perimeter as well as throughout the field.
- Adults will invade fields from the margins and if infestations are high in the borders, application of an insecticide to the field margins may be effective in reducing the population to levels below which economic injury will occur.
- An insecticide application is recommended when three to four weevils per sweep are collected and has been shown to be the most effective when canola is in the 10 to 20% bloom stage (2-4 days after flowering starts).
- Consider making insecticide applications late in the day to reduce the impact on pollinators. Whenever possible, provide advanced warning of intended insecticide applications to commercial beekeepers operating in the vicinity to help protect foraging pollinators.
- High numbers of adults in the fall may indicate the potential for economic infestations the following spring.

Damage: Adult feeding damage to buds is more evident in dry years when canola is unable to compensate for bud loss. Adults mate following a pollen meal then the female will deposit a single egg through the wall of a developing pod or adjacent to a developing seed within the pod (refer to lower right photo). Eggs are oval and an opaque white, each measuring ~1mm long. Typically a single egg is laid per pod although, when CSPW densities are high, two or more eggs may be laid per pod.

There are four larval instar stages of the CSPW and each stage is white and grub-like in appearance ranging up to 5-6mm in length (refer to lower left photo). The first instar larva feeds on the cuticle on the outside of the pod while the second instar larva bores into the pod, feeding on the developing seeds. A single larva consumes about 5 canola seeds. The mature larva chews a small, circular exit hole from which it drops to the soil surface and pupation takes place in the soil within an earthen cell. Approximately 10 days later, the new adult emerges to feed on maturing canola pods. Later in the season these new adults migrate to overwintering sites beyond the field.

Please find additional detailed information for CSPW in fact sheets posted by Alberta Agriculture and Forestry, Saskatchewan Agriculture, or the Prairie Pest Monitoring Network.
Also watch provincial reports for updates on surveying underway now. Alberta Agriculture & Forestry has posted a live CSPW map and online reporting tool for growers. A screenshot (retrieved 03Aug2017) is included below.
9. Provincial entomologists provide insect pest updates throughout the growing season so we have attempted to link to their most recent information:

- Manitoba's Insect and Disease Update for 2017 is prepared by John Gavloski and Pratisara Bajracharya and read Issue #11 (posted August 2, 2017) noting diamondback moth exceeding economic thresholds in some fields, higher numbers of soybean aphids but the appearance of natural enemies in response to their prey (so growers may refer to the Soybean Aphid App to help monitor and manage that pest), and high levels of bertha armyworm larvae have been scouted in Holland and Austin areas.
- Saskatchewan's Crop Production News - 2017 - Issue #4 includes information related to soybean pests prepared by Joel Peru. That report includes an update on scouting and management tips for painted lady butterflies (also described in Week 6) and Aphanomyces root rot. A reminder to watch for the final bertha armyworm pheromone trap counts update on the 2017 map.
- Watch for Alberta Agriculture and Forestry's Call of the Land and access the most recent Insect Update (August 3, 2017) provided by Scott Meers. This week diamondback moth numbers have exploded in southern Alberta so canola growers need to be scouting right up to swathing but be aware of Pre-harvest intervals! The annual grasshopper survey begins the first week of August for that province’s Agricultural Fieldmen. In central Alberta, Red turnip beetle are now starting to feed, mate and lay eggs that overwinter. Painted lady butterfly - the 2nd generation is starting to fly and lay eggs now so sunflower, soybean and borage growers need to continue to monitor.

10. Crop reports are produced by:
- Manitoba Agriculture, Rural Development (July 31, 2017)
- Saskatchewan Agriculture Crop Report (July 24-31, 2017)
- Alberta Agriculture and Forestry Crop Report (July 25, 2017)

11. From the field......Many prairie growers have a cutworm or armyworm story of woe but this time around growers on Vancouver Island near Port Alberni contended with an unusual pest - True armyworm (Mythimna unipuncta) in high densities were eating up hay fields and pasture! Thanks to Tracy Hueppelsheuser with the BC Ministry of Agriculture who shared this CTV news clip.

Remember to download the new Cutworm Field Guide located at the PPMN's Cutworm Corner!
12. Time of Swathing - The Canola Council of Canada created a guide to help growers estimate swathing time in canola. A screen shot of the downloadable Canola Swathing Guide has been included below for reference.
Illustration for determining seed colour change

The seeds in the pods near the top of the plant will look like this.

The seeds are still green, but should be firm. They should not crush easily when rolled between the thumb and forefinger.

Immature translucent seeds like the ones in this pod will shrivel substantially in the sun, resulting in reduced yield.

The seeds in the pods approximately half way up the plant will look like this.

Note that these are seeds with colour (tan, brown) on them. These seeds are considered to be “tamed.”

The seeds in the pods at the bottom of the plant will be “tamed” and look like this.

Tips for assessing seed colour change:
1. Start inspecting your canola field approximately 15 days after flowering ends. The end of flowering is reached when only 10% of plants have any flowers remaining.

2. Take time to assess a field. Sample at least 5 plants in several locations throughout the field to make an accurate assessment of the overall maturity of the crop. Stand on the road or in the back of your truck box to help identify the top and least mature areas of the field (e.g., low lying vs. higher elevated areas of the field) and ensure these areas are included in your sampling.

3. Use the illustration to assist in determining seed colour percentage on the main stem. Include areas with small patches of colour (spotting). Also look for firm seeds in the top pods that should not roll between the thumb and the forefinger without being easily crushed.

4. Low plant populations can lead to plants with numerous branches (see picture top right). For these plants assess not only the main stem, but side branches as well to ensure seeds that are still green are tilled with no transference.

5. Once all areas are sampled, average out the present seed colour charge for that particular field. Also note the range in maturity obtained among sampling locations.

6. Continue inspections every two to three days until ready to swath.

Swath and Harvest Tips
1. Anchor your swath. Leave as much stubble height as possible and use a swath roller to help anchor the swath and reduce risk of wind damage. Smooth the top of the swath and tuck the edges into the stubble, but be careful not to push the swath tight onto the ground.

2. Prevent bruising. Adjust canola speed and sider the swather opening as needed to prevent bruising at the desired speed of travel. Match reel speed to ground speed to minimize chaffing during swath.

3. Allow time for curing. The crop needs time to cure after swathing. Lack of moisture and/or temperature will slow enzyme breakdown of chlorophyll in the seed. Start checking green seed levels about 6 to 15 days after swathing, though they may take up to three weeks or more to drop to acceptable levels for harvesting.
13. West Nile Virus Risk – The regions most advanced in degree-day accumulations for *Culex tarsalis*, the vector for West Nile Virus, are shown in the map below. As of July 30, 2017, areas highlighted in red on the map below have accumulated sufficient heat for *C. tarsalis* to fly. Areas highlighted in red, orange and even yellow will have *C. tarsalis* flying so wear your DEET to stay protected!

![Map showing West Nile Virus risk areas](image)

The Public Health Agency of Canada posts information related to West Nile Virus in Canada. In 2016, 104 human clinical cases of West Nile Virus were reported. The map of clinical cases of West Nile Virus in Canada in 2017 is updated through the summer and two cases of viral West Nile have been reported so far (as of July 22, 2017). Both cases were reported from Ontario (in Timiskaming and Windsor-Essex).

The Canadian Wildlife Health Cooperative compiles and posts information related to their disease surveillance for West Nile Virus in birds. As of August 3, 2017, 964 birds were examined and 23 have tested positive for West Nile virus; two from Manitoba, eight from Ontario, and 13 from Quebec.

The Public Health Agency of Canada also monitors and posts updates on the status of WNV in Mosquitoes. As of July 22, 2017, Quebec, Ontario, Manitoba and Saskatchewan have reports of positive mosquito pools of West Nile Virus. A total of 47 positive mosquito pools have been found:

- **33 from Ontario** [Peel Regional (5), Toronto (6), Halton(5), Haliburton-Kawarta-Pine Ridge District(1), Simcoe Muskoka District (1), Windsor-Essex County (6), Eastern Ontario (1), Durham Regional (1), Hamilton (1), Haliburton-Kawarta-Pine Ridge district (1), Hastings and Prince Edward Countries (2), and York Regional (3)];
- **11 from Manitoba** [(Winnipeg (3), Southern (2), Interlake eastern (1), and Prairie Mountain(5)];
- **2 from Quebec** [Montérégie (1), Laval (1)], and
- **1 from Saskatchewan.**

14. Insects as food - Earlier this summer a link was posted taking readers to an article about unique popcorn toppings. While novel, the cricket topping for popcorn will surely be followed by other insect-based food items in the future. In 2013, a FAO report entitled, "Edible insects: future prospects for food and feed security" was published. The
document noted a predicted global population of 9 billion by 2050, the increasing need for more sustainable means to produce food and the feasibility of insects as means to do so.

Last week, the Financial Post printed a follow-up article describing Canadian entrepreneurs and their efforts to mainstream insects as food for humans, livestock and pets.

15. Questions or problems accessing the contents of this Weekly Update? Please e-mail either Dr. Owen Olfert or Jennifer Otani. Past “Weekly Updates” can be accessed on our Weekly Update page.

16. Previous Posts - The following is a list of 2017 Posts - click to review:

Alfalfa Weevil (Week 11)
Brood X Cicadas

Cabbage seedpod weevil (Week 12)
Canola scouting chart
Cereal leaf beetle
Crickets with your popcorn
Cutworms

Diamondback moth

Flax scouting chart
Flea beetles

Grasshoppers (Week 13)

Iceberg reports

Lily leaf beetle

Monarch migration (Week 10)

Painted lady butterflies (Week 9)
Pea leaf weevil
PMRA Pesticide Label Mobile App

Nysius niger (Week 8)

Ticks and Lyme disease

Weather radar
Wheat midge
White grubs in fields (Week 9)
Wildfires (Week 13)
Wind trajectories