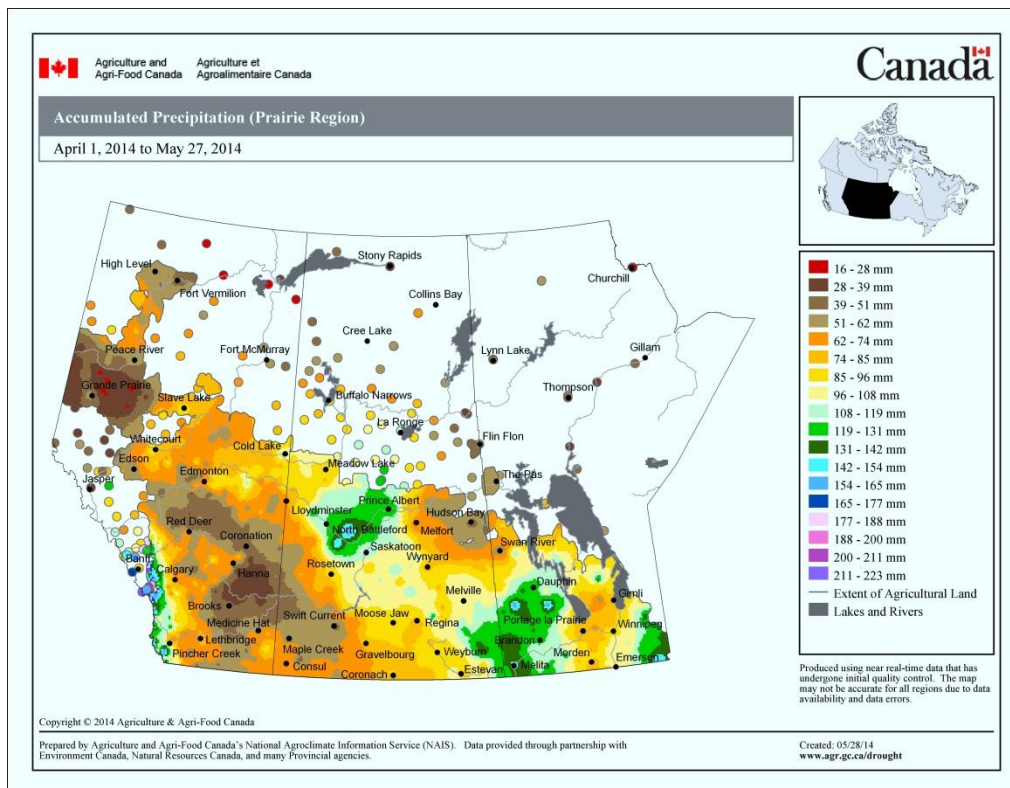


Prairie Pest Monitoring Network Weekly Updates – May 28, 2014

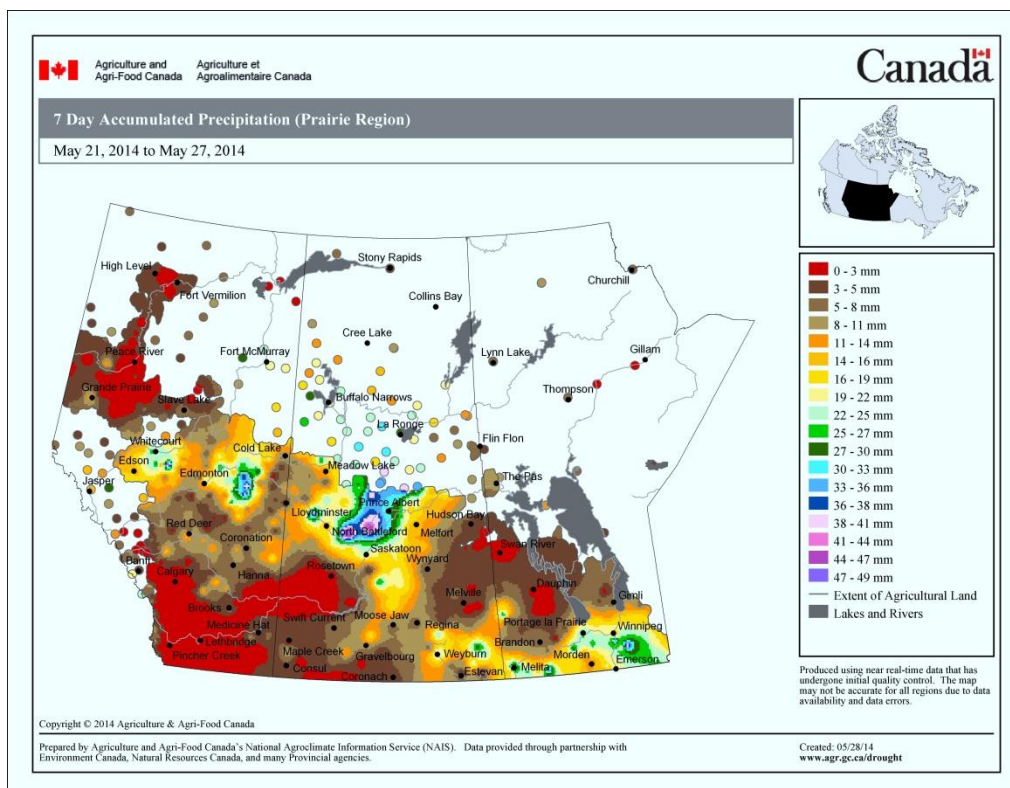
Otani, Giffen, Weiss, Olfert

1. Greetings! Hopefully those seedlings are starting to emerge and now the field scouting begins in earnest!

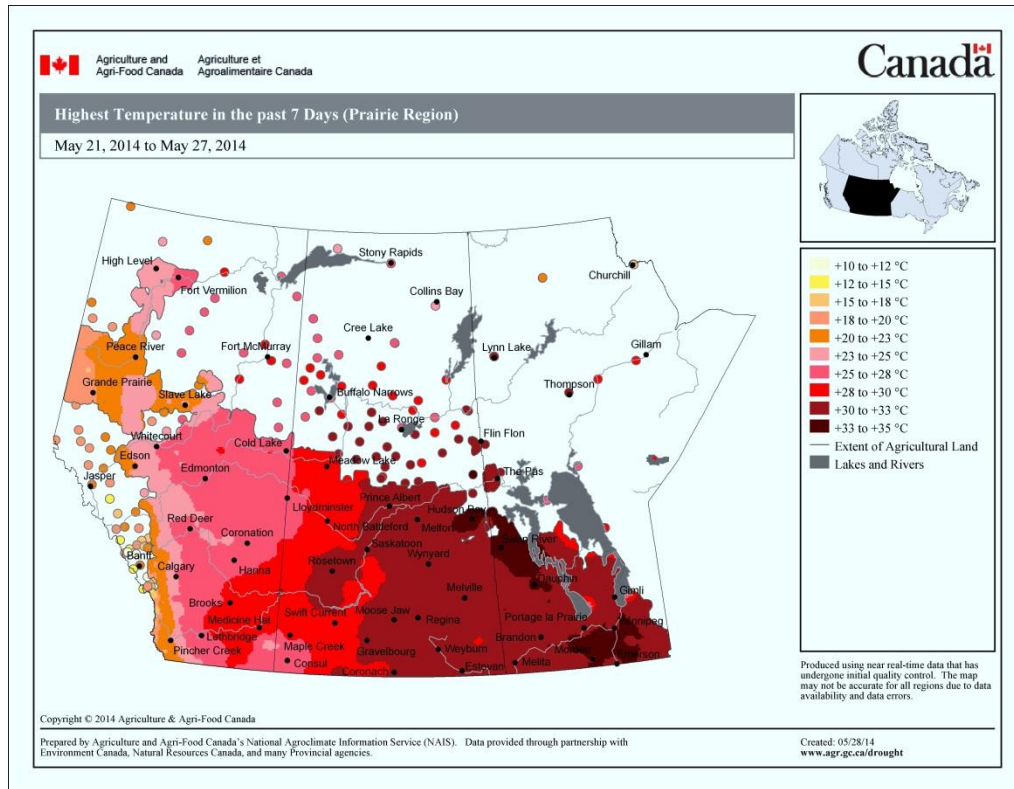
2. Weather synopsis – Below is the **Accumulated Precipitation for the Growing Season** (i.e., April 1-May 27, 2014):



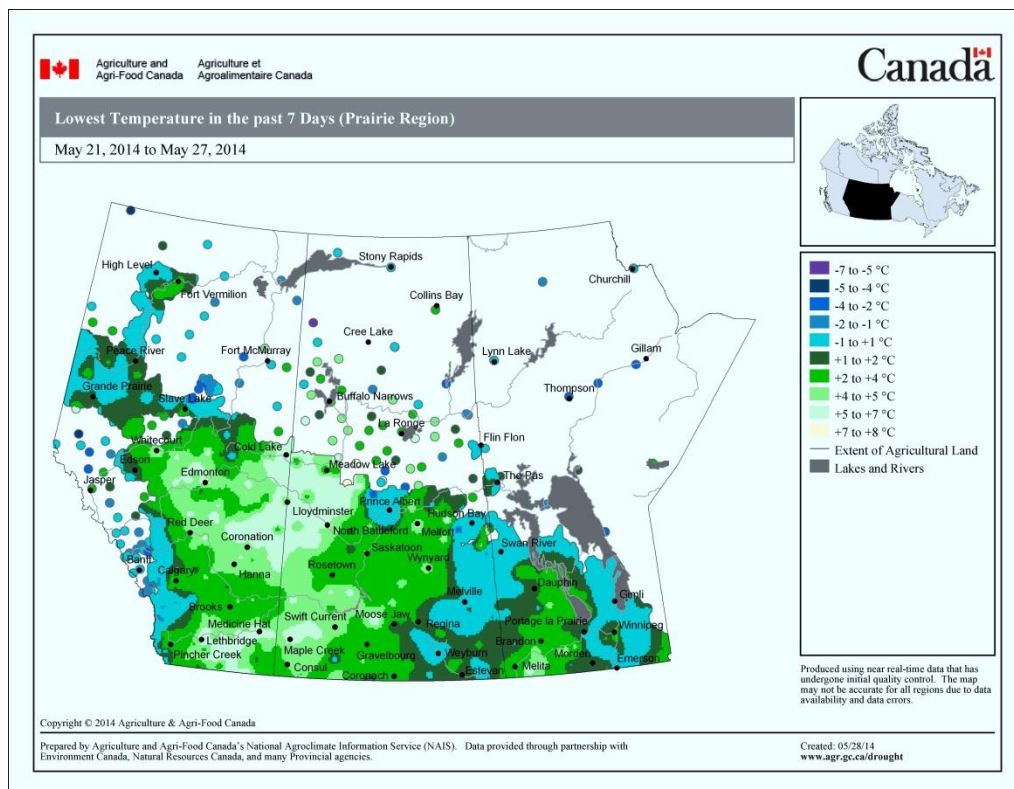
While below is the **Accumulated Precipitation the Past 7 Days** (i.e., May 21-27, 2014):



Warmer temperatures again across the prairies - the past week Manitoba, Saskatchewan and southern Alberta experienced with some summer-like heat. The map below shows the **Highest Temperatures the Past 7 Days** (May 21-27, 2014) across the prairies:



While the map below shows the **Lowest Temperatures the Past 7 Days** (May 21-27, 2014):





3. Wind trajectories Related to Diamondback Moth (DBM) and Aster Leafhopper Introductions – High altitude air masses originate from southern locations and continuously move northerly to Canadian destinations. Insect pest species such as Diamondback moth and Aster leafhoppers, traditionally unable to overwinter above the 49th parallel, can utilize these air masses in the spring to move north from Mexico and the United States (southern or Pacific northwest). Data acquired from Environment Canada is compiled by Olfert et al. (AAFC-Saskatoon) to track and model spring high altitude air masses with respect to potential introductions of insect pests onto the Canadian prairies. Please refer to earlier [Weekly Updates](#) for more details related to backward and forward trajectories associated with air parcels moving over western Canadian locations.

Reverse Trajectories (RT)

a. Pacific Northwest (PNW) – The number of RT's originating in the PNW has increased over the last few days (Fig. 1 and 2).

| vwQryReversePNWPrairiesDistinctLocations | | | |
|--|---------------|--------|---------|
| LocationID | Arriving Date | LocLat | LocLong |
| YORKTON_SK | 26/05/2014 | 51.2 | -102.4 |
| WANHAM_AB | 26/05/2014 | 55.7 | -118.4 |
| UNITY_SK | 26/05/2014 | 52.4 | -109.1 |
| SELKIRK_MB | 26/05/2014 | 50.1 | -96.9 |
| SASKATOON_SK | 26/05/2014 | 52.2 | -106.6 |
| OLDS_AB | 26/05/2014 | 51.8 | -114.1 |
| LETHBRIDGE_AB | 26/05/2014 | 49.7 | -112.8 |
| KINDERSLEY_SK | 26/05/2014 | 51.5 | -109.1 |
| GAINSBOROUGH_SK | 26/05/2014 | 49.2 | -101.4 |
| CARMAN_MB | 26/05/2014 | 49.5 | -98 |
| BRANDON_MB | 26/05/2014 | 49.8 | -99.9 |
| BEISEKER_AB | 26/05/2014 | 51.4 | -113.5 |
| YORKTON_SK | 25/05/2014 | 51.2 | -102.4 |
| WATROUS_SK | 25/05/2014 | 51.6 | -105.5 |
| TISDALE_SK | 25/05/2014 | 52.8 | -104 |
| SASKATOON_SK | 25/05/2014 | 52.2 | -106.6 |
| PROVOST_AB | 25/05/2014 | 52.4 | -110.3 |
| OLDS_AB | 25/05/2014 | 51.8 | -114.1 |
| NORTH_BATTLEFORD_SK | 25/05/2014 | 52.8 | -108.3 |
| NAICAM_SK | 25/05/2014 | 52.4 | -104.5 |
| LETHBRIDGE_AB | 25/05/2014 | 49.7 | -112.8 |
| GRENFELL_SK | 25/05/2014 | 50.4 | -102.9 |
| BEISEKER_AB | 25/05/2014 | 51.4 | -113.5 |
| WATROUS_SK | 24/05/2014 | 51.6 | -105.5 |
| UNITY_SK | 24/05/2014 | 52.4 | -109.1 |
| TISDALE_SK | 24/05/2014 | 52.8 | -104 |
| RYCROFT_AB | 24/05/2014 | 55.8 | -118.7 |
| RUSSELL_MB | 24/05/2014 | 50.8 | -101.3 |
| REGINA_SK | 24/05/2014 | 50.5 | -104.5 |
| PROVOST_AB | 24/05/2014 | 52.4 | -110.3 |
| OLDS_AB | 24/05/2014 | 51.8 | -114.1 |
| NORTH_BATTLEFORD_SK | 24/05/2014 | 52.8 | -108.3 |
| NAICAM_SK | 24/05/2014 | 52.4 | -104.5 |



| vwQryReversePNWPrairiesDistinctLocations | | | |
|--|---------------|--------|---------|
| LocationID | Arriving Date | LocLat | LocLong |
| LETHBRIDGE_AB | 24/05/2014 | 49.7 | -112.8 |
| KINDERSLEY_SK | 24/05/2014 | 51.5 | -109.1 |
| DAUPHIN_MB | 24/05/2014 | 51.1 | -100 |
| BRANDON_MB | 24/05/2014 | 49.8 | -99.9 |
| BEISEKER_AB | 24/05/2014 | 51.4 | -113.5 |

Fig. 1.

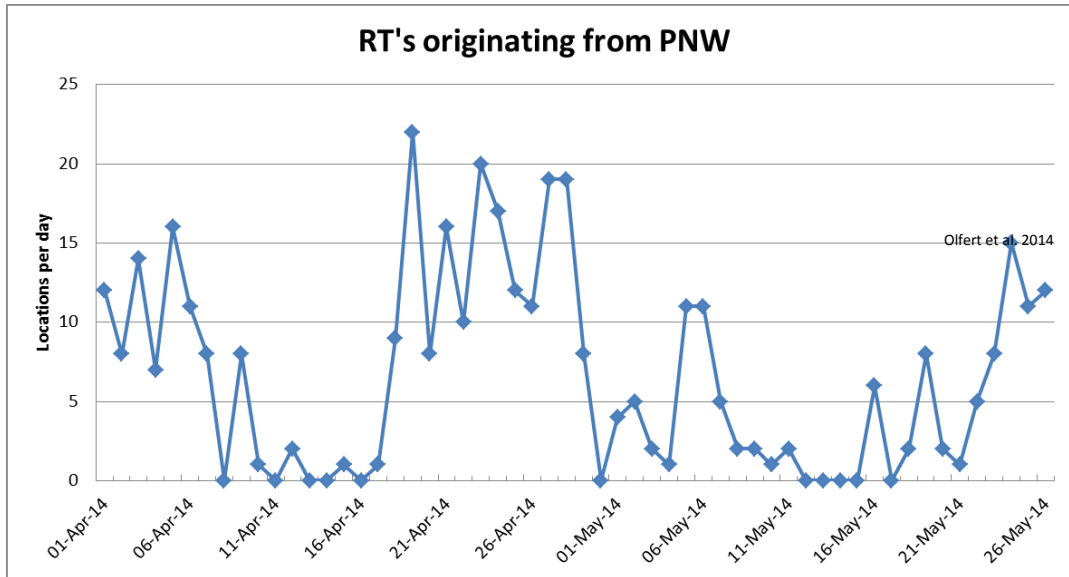
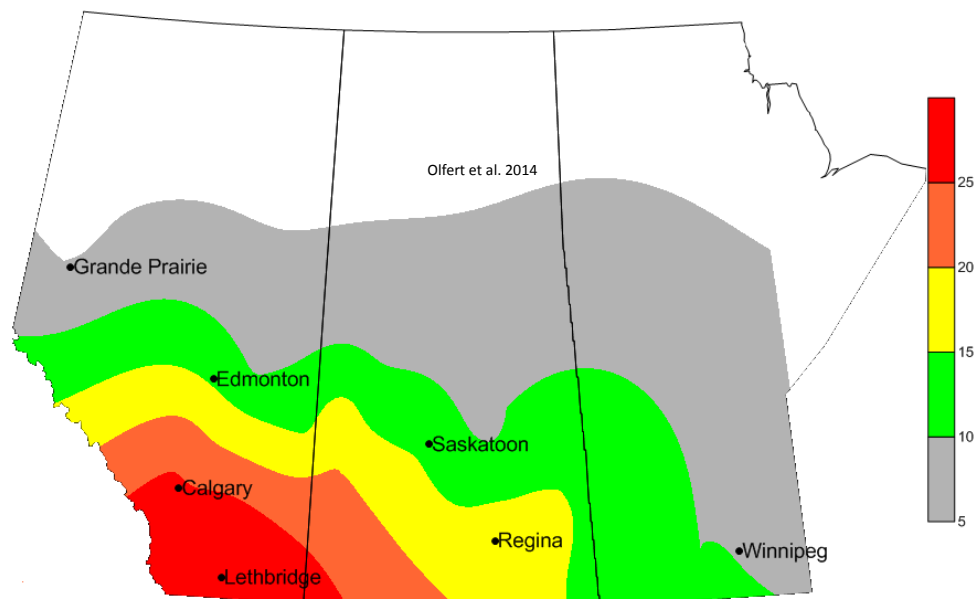


Fig. 2.

Seasonal total number reverse trajectories originating from US PNW
April 1 - May 26, 2014





b. Mexico and southwest USA (SW) – The number of RT's, originating in southwest USA and Mexico, crossing the prairies has increased over the last few days (Fig. 3). Trajectories, combined with recent rainfall, particularly in Manitoba, may produce downward air events that may result in DBM introductions (Fig. 4).

| vwQryReverseDBMPrairiesDistinctLocations | | | |
|--|--------|---------|---------------|
| LocationID | LocLat | LocLong | Arriving Date |
| SELKIRK_MB | 50.1 | -96.9 | 26/05/2014 |
| PORTAGE_MB | 50 | -98.3 | 26/05/2014 |
| GAINSBOROUGH_SK | 49.2 | -101.4 | 26/05/2014 |
| CARMAN_MB | 49.5 | -98 | 26/05/2014 |
| BRANDON_MB | 49.8 | -99.9 | 26/05/2014 |
| SELKIRK_MB | 50.1 | -96.9 | 25/05/2014 |
| RUSSELL_MB | 50.8 | -101.3 | 25/05/2014 |
| REGINA_SK | 50.5 | -104.5 | 25/05/2014 |
| PORTAGE_MB | 50 | -98.3 | 25/05/2014 |
| GRENFELL_SK | 50.4 | -102.9 | 25/05/2014 |
| GAINSBOROUGH_SK | 49.2 | -101.4 | 25/05/2014 |
| DAUPHIN_MB | 51.1 | -100 | 25/05/2014 |
| CARMAN_MB | 49.5 | -98 | 25/05/2014 |
| BRANDON_MB | 49.8 | -99.9 | 25/05/2014 |
| GRENFELL_SK | 50.4 | -102.9 | 24/05/2014 |
| CARMAN_MB | 49.5 | -98 | 24/05/2014 |

Fig. 3.

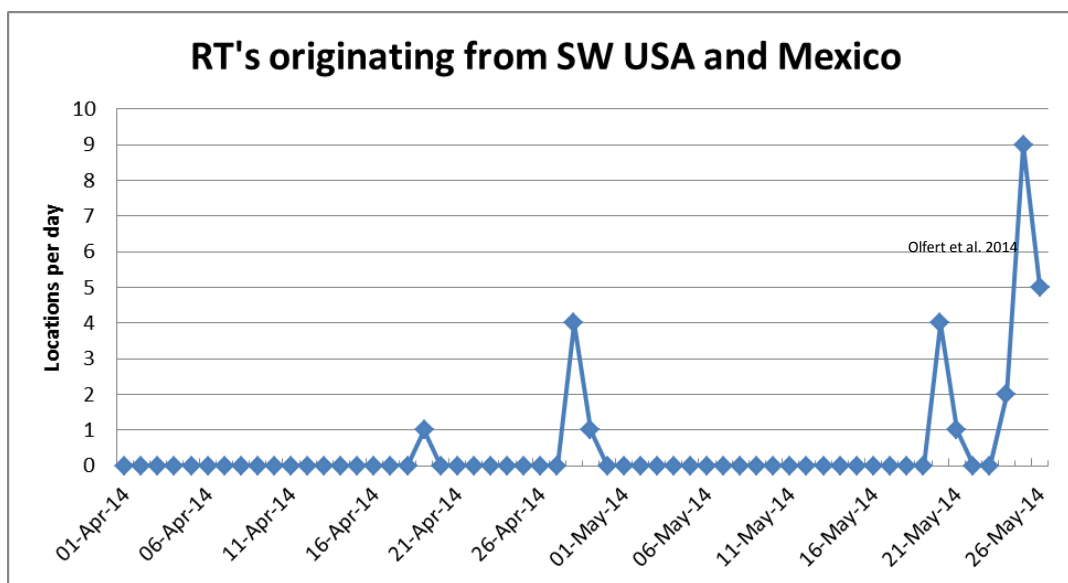
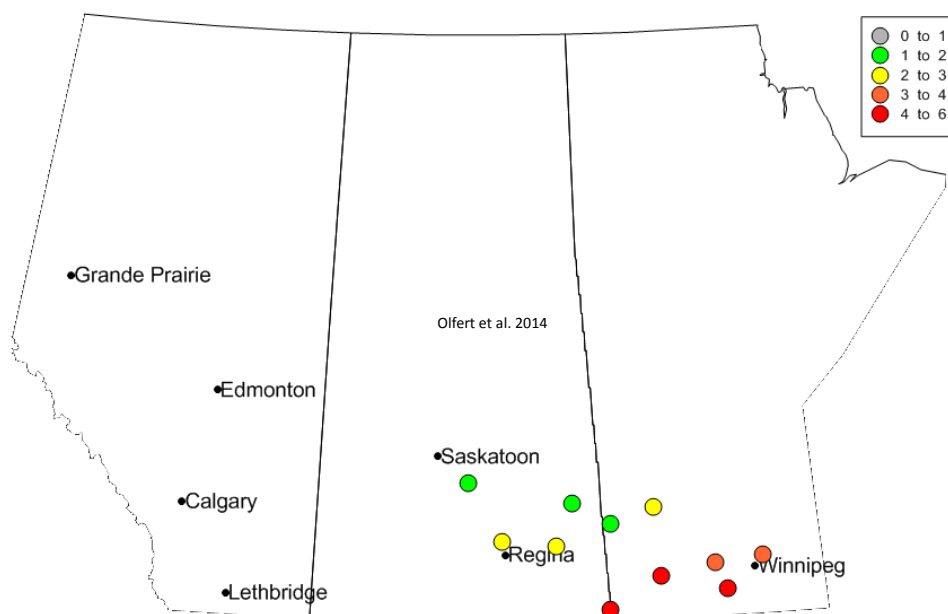




Fig. 4. Seasonal total number reverse trajectories originating from SW USA and Mexico April 1 - May 26, 2014



c. Total number of RT's crossing over each location – The following table summarizes the total number of RT's that have crossed over Manitoba and eastern Saskatchewan (April 1 to May 26, 2014).

| vwQryReverseDBMPrairiesDistinctLocationCountDates | | | |
|---|--------|---------|-----------------|
| LocationID | LocLat | LocLong | Number of Dates |
| BRANDON_MB | 49.8 | -99.9 | 4 |
| CARMAN_MB | 49.5 | -98 | 4 |
| GAINSBOROUGH_SK | 49.2 | -101.4 | 4 |
| PORTAGE_MB | 50 | -98.3 | 3 |
| SELKIRK_MB | 50.1 | -96.9 | 3 |
| GRENFELL_SK | 50.4 | -102.9 | 2 |
| REGINA_SK | 50.5 | -104.5 | 2 |
| DAUPHIN_MB | 51.1 | -100 | 2 |
| RUSSELL_MB | 50.8 | -101.3 | 1 |
| WATROUS_SK | 51.6 | -105.5 | 1 |
| YORKTON_SK | 51.2 | -102.4 | 1 |



Forward trajectories (FT)

Forward trajectories, originating from the following locations, are predicted to cross the prairies within the next five days:

| vwQryForwardPrairies | |
|----------------------------|-------------|
| LocationID | InitialDate |
| BOZEMAN_MONTANA | 26/05/2014 |
| BROWNSVILLE_TEXAS | 26/05/2014 |
| EASTERN_WASHINGTON | 26/05/2014 |
| IMPERIAL_VALLEY_CALIFORNIA | 26/05/2014 |
| MEXICALI_MEXICO | 26/05/2014 |
| MOSCOW_IDAHO | 26/05/2014 |
| BOZEMAN_MONTANA | 25/05/2014 |
| CELAYA_MEXICO | 25/05/2014 |
| EASTERN_WASHINGTON | 25/05/2014 |
| MANHATTAN_KANSAS | 25/05/2014 |
| MEXICALI_MEXICO | 25/05/2014 |
| MOSCOW_IDAHO | 25/05/2014 |
| WESLACO_TEXAS | 25/05/2014 |

4. Flea Beetles (Chrysomelidae: *Phyllotreta* species) – This past week, reports of flea beetle damage warranting insecticide control came from near Beaverlodge and Lacombe. As canola emerges, be on the lookout for flea beetle damage resulting from feeding on the cotyledons but also on the stem (Fig. 5). A reminder that the **Action Threshold** for flea beetles on canola remains **25% of cotyledon leaf area consumed**.



Fig. 5: Flea beetle feeding on *B. juncea* plant.



Fig. 6: Striped flea beetle (*Phyllotreta striolata*) measuring ~2.5mm long.

5. Cutworms (Noctuidae) – Keep an eye on fields that are “slow” to emerge, are missing rows, include wilting or yellowing plants, have bare patches, or appear highly attractive to birds – these are areas warranting a closer look. Plan to follow-up by walking these areas later in the day when some cutworm species move above-ground to feed. Start to dig below the soil surface (1-5cm deep) near the base of a symptomatic plant or the adjacent healthy plant. If the plant is well-established, check within the crown in addition to the adjacent



soil. The culprits could be wireworms or cutworms. Cutworms can be 1-2 cm long in the spring and can include several species ranging in colour from shiny opaque, to tan, to brownish-red with chevron patterning.

Cutworm biology, species information, plus monitoring recommendations are available at the Prairie Pest Monitoring Network's [Cutworm Monitoring Protocol](#). Also refer to these cutworm-specific fact sheets ([Manitoba Agriculture, Food and Rural Initiatives](#), [Alberta Agriculture, Food and Rural Development](#)).

Cutworm larvae are needed this spring for research – dead or alive. Refer to this [website](#) for detailed collecting information. Most importantly, please help the following researchers if you are finding cutworm infestations in your region (Note: No Collect Shipping Please):

| | | |
|--|---|---|
| In Manitoba: Drop samples off or send priority mail to: Attn: Udari Wanigasekara University of Manitoba Dept. of Entomology 12 Dafoe Road University of Manitoba Winnipeg, MB R3T 2N2 Phone: 204-474-7485 Email: udari_madu@yahoo.com | In Saskatchewan: Drop samples off or send priority mail to: Attn: Scott Hartley Cutworm Survey Crop Protection Lab Saskatchewan Ministry of Agriculture 346 MacDonald St. Regina, SK S4N 6P6 Phone: 306-787-8130 Email: Scott.Hartley@gov.sk.ca | In Southern Alberta Attn: Jeremy Hummel 4101 22 Ave S Lethbridge, AB T1K 4Y3 Phone: 403-320-3202 ext. 5347 Email: jyhmm1@gmail.com |
| In Central Alberta Attn: Jim BROATCH or Patty REID Lacombe Research Centre 6000 C & E Trail Lacombe, AB T4L 1W1 Tel. 403-396-2535 Jim.Broatch@gov.ab.ca Patty.Reid@agr.gc.ca | In Northern Alberta Attn: Jennifer OTANI #1 Research Station Road Beaverlodge Research Farm Agriculture & Agri-Food Canada Beaverlodge AB T0H 0C0 Tel. 780-354-5132 Jennifer.Otani@agr.gc.ca Twitter: @bugs5132 | In BC Peace River Region Attn: Arlan Benn 401-114 th Avenue Dawson Creek, BC V1G 2Z7 Phone: 604-349-3719 Twitter @BCPPM Email: bcpeacepestmonitoring@gmail.com |

If cutworms are spotted in Albertan fields, please also consider using the Alberta Pest Surveillance Network's "2014 Cutworm Reporting Tool" for online reporting located by clicking [here](#). Data entered at that website uploads to a live online ["Cutworm Map"](#).

6. Pea Leaf Weevil (*Sitona lineatus*) – Overwintered adults were readily collected in winter peas in southern Alberta (Carcamo, May 14, 2014). Pea leaf weevils emerge in the spring primarily by flying (at temperatures above 17°C) or they may walk short distances. Pea leaf weevil movement into peas and faba beans is achieved primarily through flight. Adults are slender, greyish-brown measuring approximately 5 mm in length (Fig. 6). The pea leaf weevil resembles the sweet clover weevil (*Sitona cylindricollis*) yet the former is distinguished by three light-coloured stripes extending length-wise down thorax and sometimes the abdomen (Link here for the [Pea leaf weevil monitoring protocol](#) with photos of related weevils). All species of *Sitona*, including the pea leaf weevil, have a short snout.

Adults will feed upon the leaf margins and growing points of legume seedlings (alfalfa, clover, dry beans, faba beans, peas) and produce a characteristic, scalloped (notched) edge (Figures 7-9). Females lay 1000 to 1500 eggs in the soil either near or on developing pea or faba bean plants from May to June.



Fig. 7: Dorsal view of adult *S. lineatus* (Photo: H. Goulet).



Figure 8: Weevil damage consisting of notching on leaves (Photo: L. Dosdall).



Figure 9: Weevil feeding notches along perimeter of pea leaves (Photo: L. Dosdall).

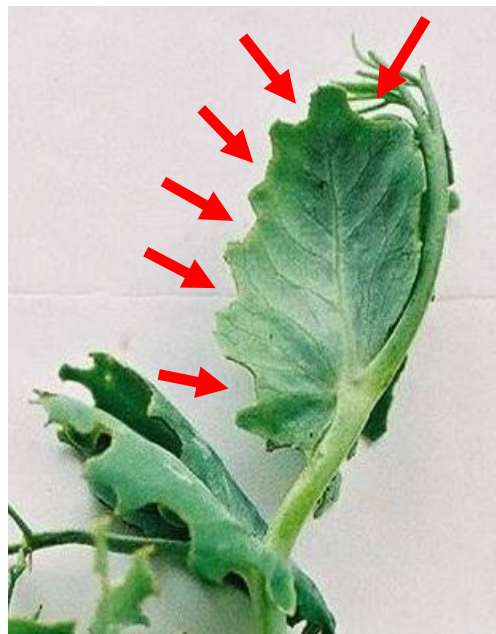


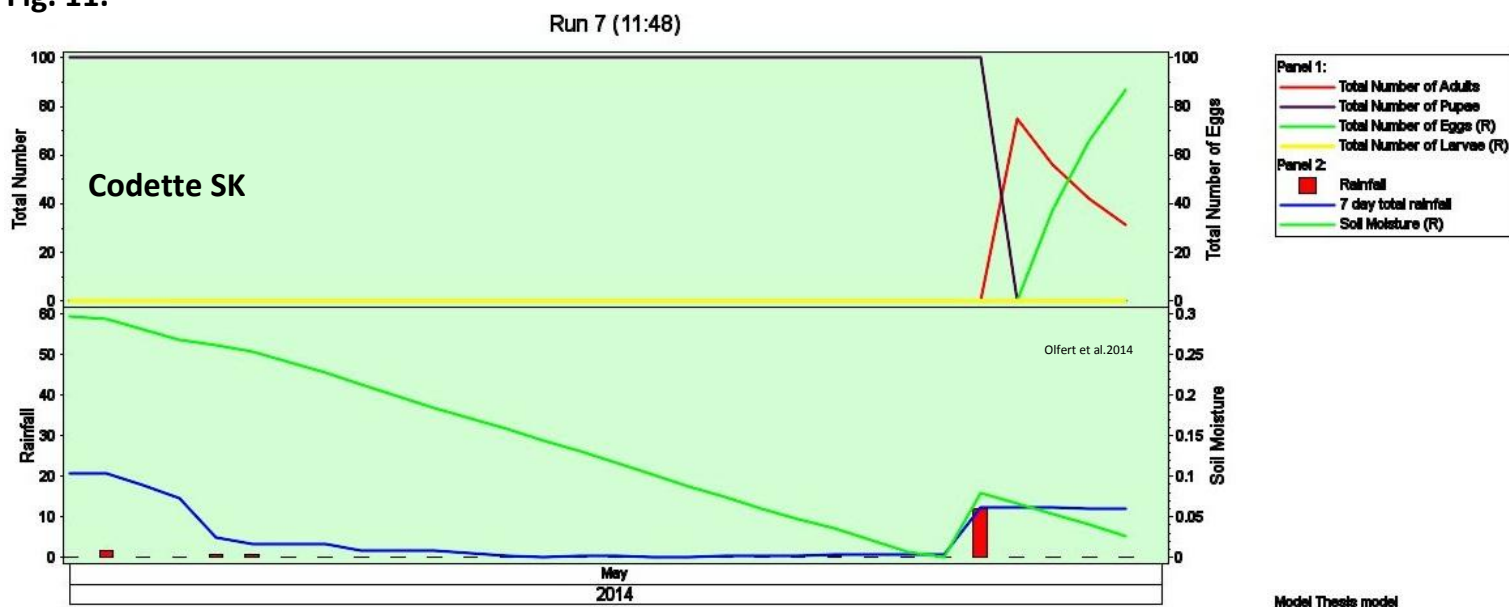
Figure 10: Pea leaf weevil feeding notches on clam leaf (Photo: L. Dosdall).



7. Insect Development and Simulation Outputs – Though temperatures were warmer over the past week, average daily temperatures (May 1-26, 2014) have been 1-2°C below normal and have resulted in slowed insect development across Manitoba, Saskatchewan and Alberta. To date, the average temperature for May (1-19) has been 6.8°C and is 2.8°C cooler than long-term normal (LTN). Over the same period, prairie rainfall has been 83% of LTN. Conditions have been wettest in western Manitoba.

- a. **Swede Midge (*Contarinia nasturtii*)** – Model output suggests that **pupal development has begun in northeast Saskatchewan and northwest Manitoba**. Weekend rain showers should enhance emergence of adults. Current model runs indicate that **midge emergence has begun in this region and larvae are predicted to occur in late May**. The following graph (Fig. 11) illustrates that adult emergence (top panel, red line) coincided with rain and subsequent increased soil moisture (bottom panel).

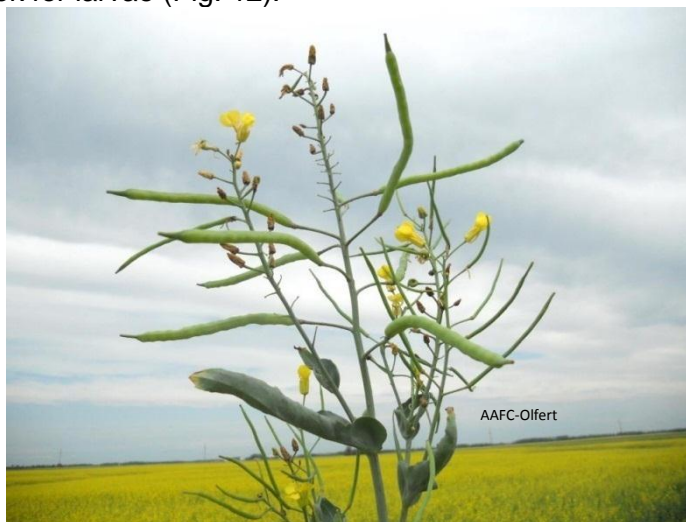
Fig. 11.



For those participating in swede midge pheromone monitoring, remember that swede midge are multivoltine so please change sticky card inserts as described in [Dr. J. Soroka's updated monitoring protocol](#) so researchers can help confirm its distribution, look for seasonal peaks and hopefully confirm the number of generations across the Canadian prairies. As canola buds start to form, remember to watch for unusual plant structure, discolorations then start to look for larvae (Fig. 12).



Fig. 12: Swede midge larvae inside canola flower (Upper) and canola damage observed in a field in Northeast Saskatchewan (Right; Photos: AAFC)





b. **Cereal Leaf Beetles (*Oulema melanopus*)** – For 2014 we are using our cereal leaf beetle simulation model to monitor development across the prairies. Model runs suggest that **oviposition has begun in locations across the prairies this week** (Fig. 13-16). **Larvae are predicted to appear in early June** (refer to blue line for larval curves).

Fig. 13: **LETHBRIDGE AB**

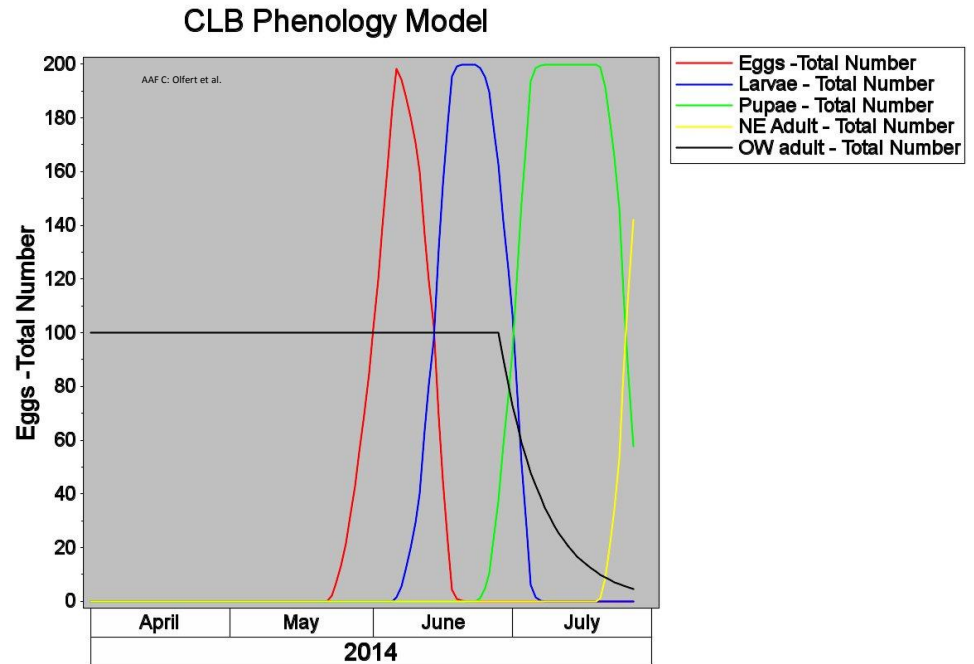


Fig. 14: **MAPLE CREEK SK**

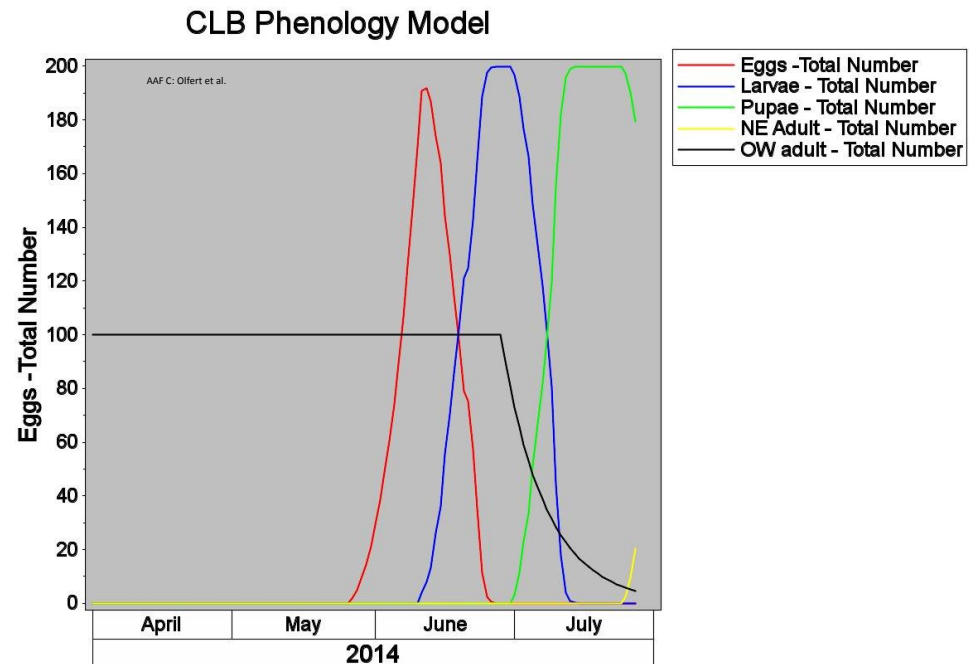




Fig. 15: YORKTON SK

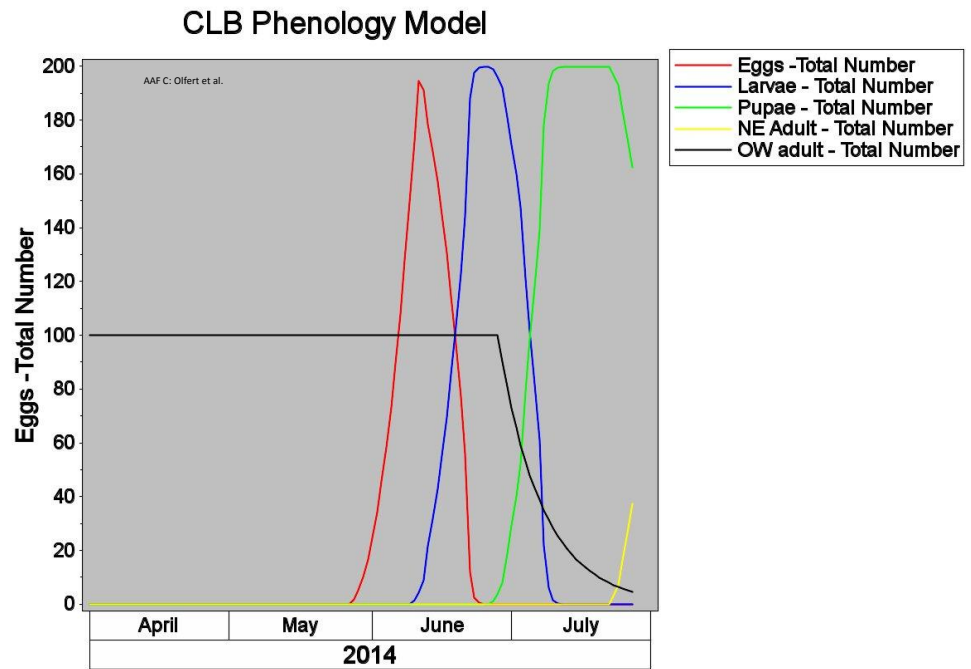
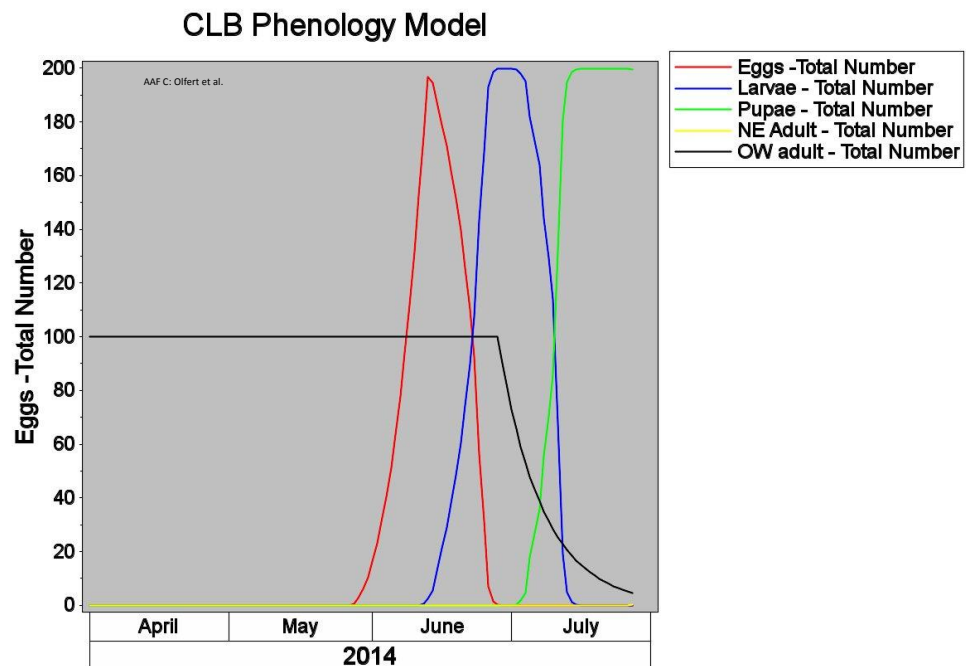


Fig. 16: SWAN RIVER MB

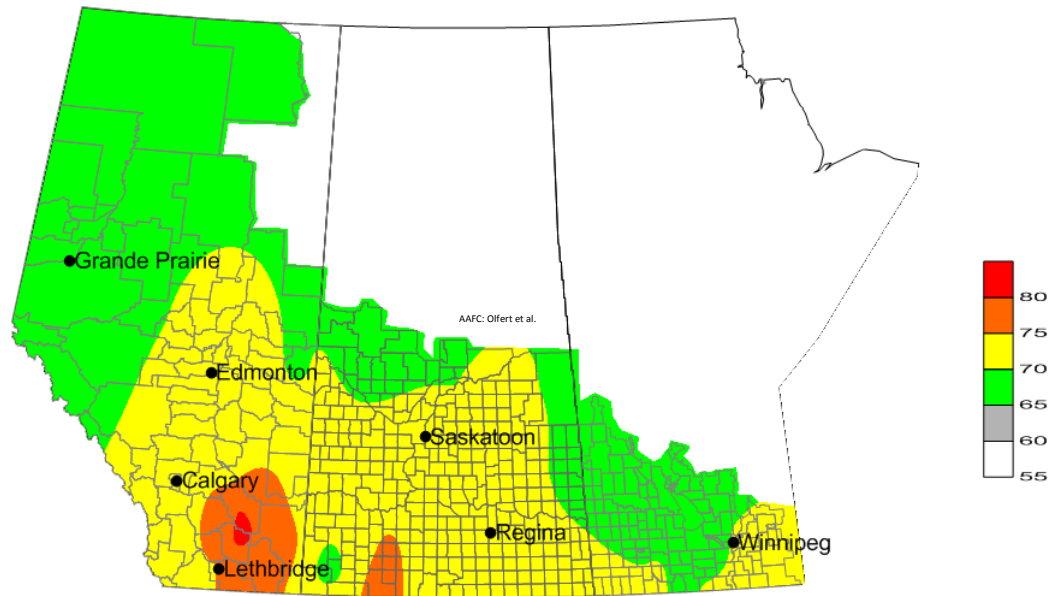


c. Grasshoppers - Weekly temperature data collected across the prairies is incorporated into the simulation model which calculates estimates of grasshopper development stages based on biological parameters for *Melanoplus sanguinipes* (Migratory grasshopper). Recent warm temperatures have increased embryological development. Mean embryological development is predicted to be 71%. Last week development was 60%. Embryological development can vary widely, not only between locations but also within short distances along roadsides and in fields. The first appearance of hatchlings usually occurs when mean embryological development is 75%. **Development is predicted to be greatest across southern and central Alberta.** Across the prairies, **hatchings are predicted to occur during the last week of May**



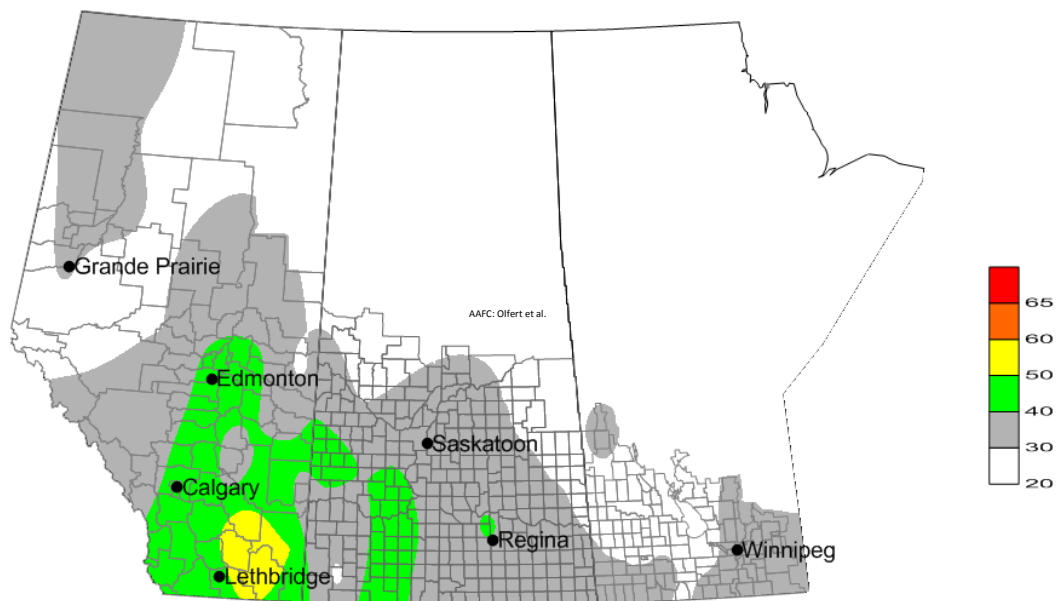
with peak hatch occurring during the first two weeks of June (Fig. 17). This week hatchlings were observed during survey of SW SK.

Fig. 17. Grasshopper embryological development (%)
May 26, 2014



d. Bertha armyworm (*Mamestra configurata*) – Weekly temperature data collected across the prairies is similarly incorporated into the simulation model which calculates estimates of Bertha armyworm (BAW) development stages based on biological parameters for the species. **The BAW model indicates that pupal development has begun.**

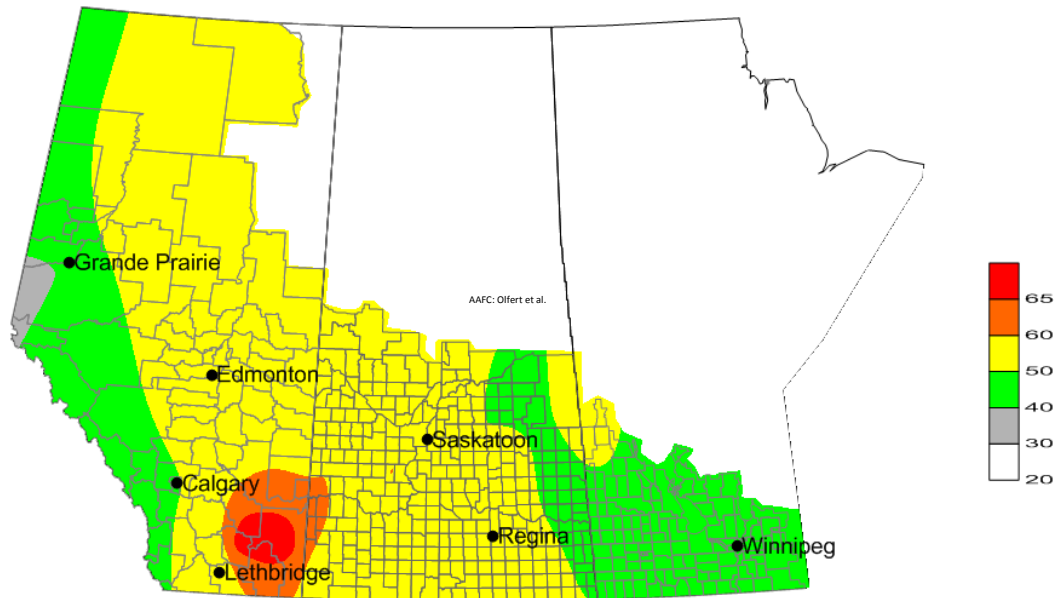
Fig. 18. BAW pupal development (%)
May 26, 2014





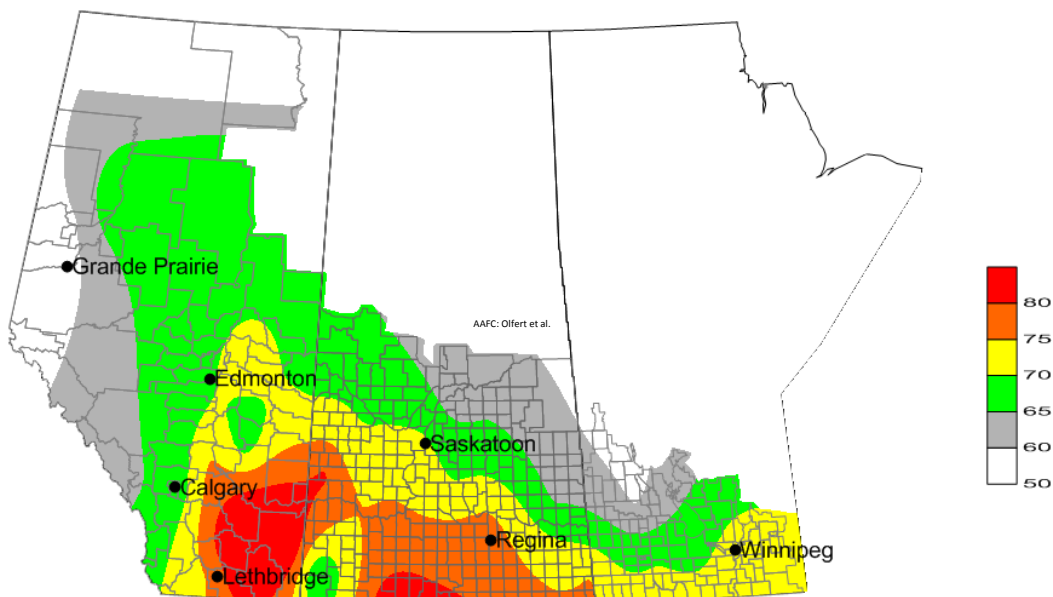
Relative to previous years, cooler temperatures have resulted in reduced pupal development. Last year pupal development was 40% or greater across the prairies. The following map presents model output for May 26, 2013 (Fig. 19).

Fig. 19. BAW pupal development (%)
May 26, 2013



The initial emergence of adults for the 2014 growing season can occur when average pupal development reaches 80%. **The model was used to predict BAW pupal development for June 9, 2014, (Fig. 20)** in order to help predict when BAW pheromone traps are optimally deployed. **Those of you with BAW pheromone traps, please deploy traps in the red areas of the map by June 9th in order to intercept moths as they begin to emerge.**

Fig. 20. BAW pupal development (%)
Model prediction for June 9, 2014





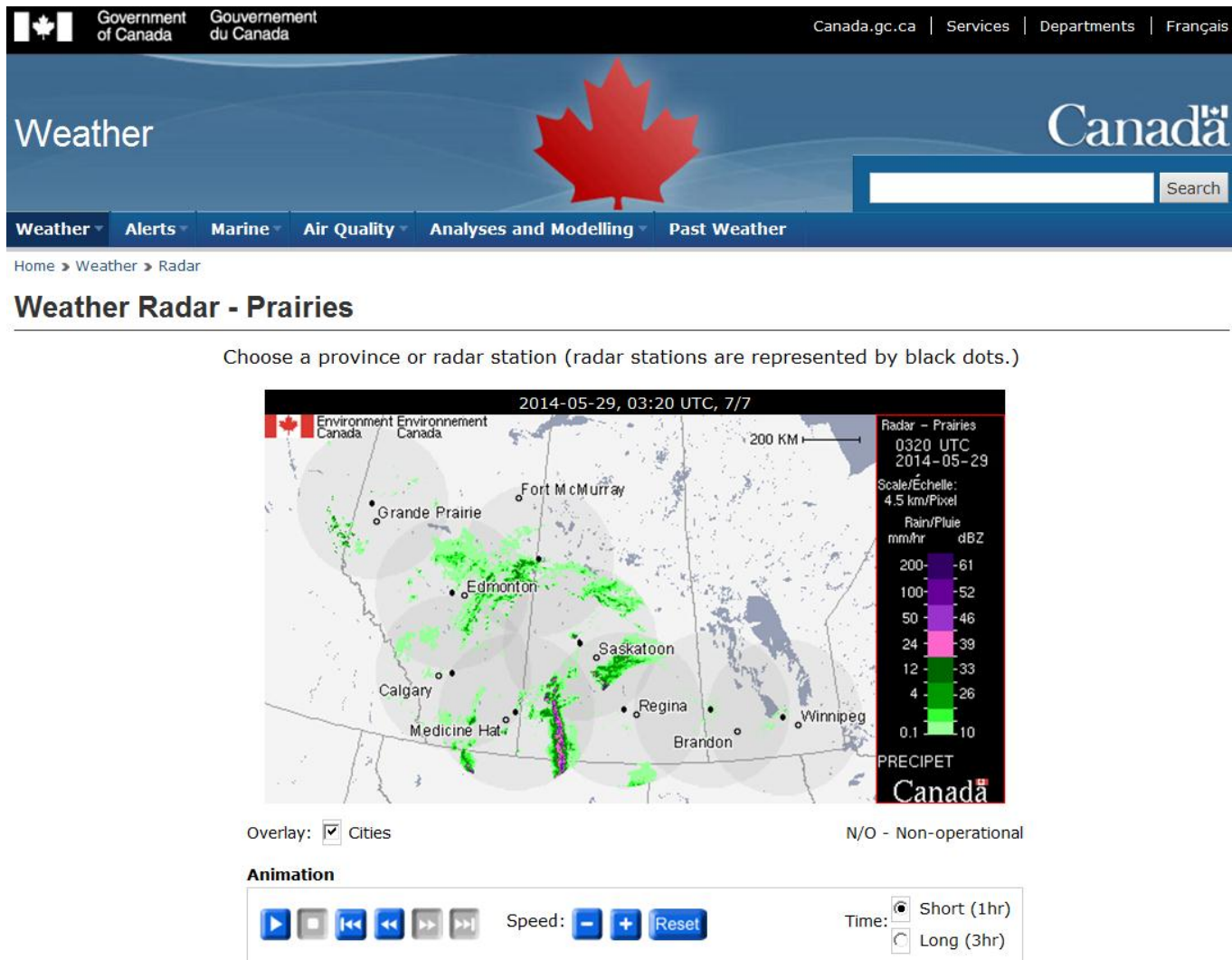
8. Crop Reports - The following provincial websites now have their Crop Reports posted so click the links to find their weekly updates:

- Saskatchewan's Crop Report: <http://www.agriculture.gov.sk.ca/crop-report>
- Manitoba's Crop Report: <http://www.gov.mb.ca/agriculture/crops/seasonal-reports/crop-report-archive/index.html>
- Alberta's Crop Report: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/sdd4191](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sdd4191)

Link here for the USDA's [Weekly Weather and Crop Bulletin](#) and link here for [this week's bulletin](#).

9. Lost Ladybug Project – For those of you with an inkling, [link here](#) to help Cornell researchers survey for species of North American ladybird beetles. If you find any ladybug, Cornell researchers are requesting you submit an online photo, location, date, and habitat information for the specimen then they will do their best to identify it. The website has several interactive maps which include Canadian submissions.

10. Environment Canada: Weather Radar – When scheduling in-field scouting and pesticide applications, consider checking Environment Canada's radar data which shows **recent precipitation patterns** which can be linked to by [clicking here](#). An example of the webpage is pasted below. Remember to note the time stamp in the top, right corner of the animation while it "plays" as either a 1-hr repeating animation or click the 3-hr long version.





More specifically, the following radar stations across the prairies provide the past one-hour or three-hour animated clips of precipitation patterns (click the town nearest you for website links): [Woodlands MB](#), [Foxwarren MB](#), [Bethune SK](#), [Radisson SK](#), [Jimmy Lake AB](#), [Schuler AB](#), [Strathmore AB](#), [Carvel AB](#), [Spirit River AB](#), [Prince George BC](#).

11. Questions or problems accessing the contents of this Weekly Update? Please e-mail or call either Owen.Olfert@agr.gc.ca (tel. 306-385-9355) or Jennifer.Otani@agr.gc.ca (tel. 780-354-5132). Past and present "Weekly Updates" are kindly posted to the Western Forum website by webmaster, Dr. Kelly Turkington. Please [click here](#) to link to that webpage.