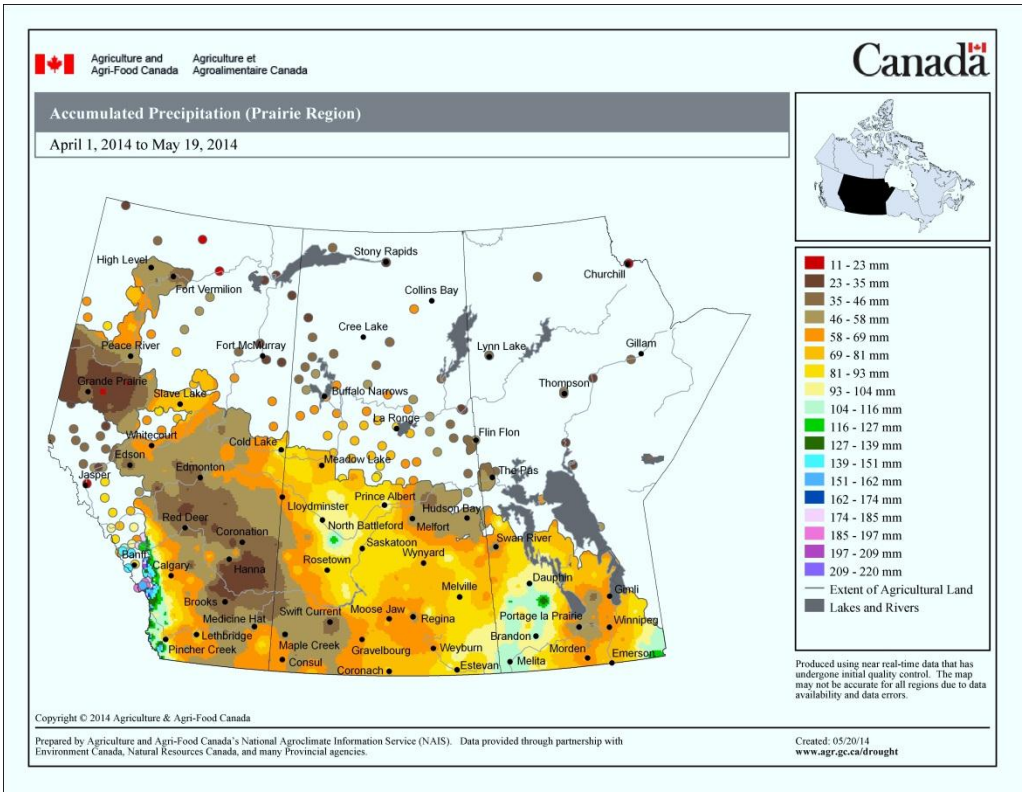
***Prairie Pest Monitoring Network Weekly Updates – May 21, 2014***

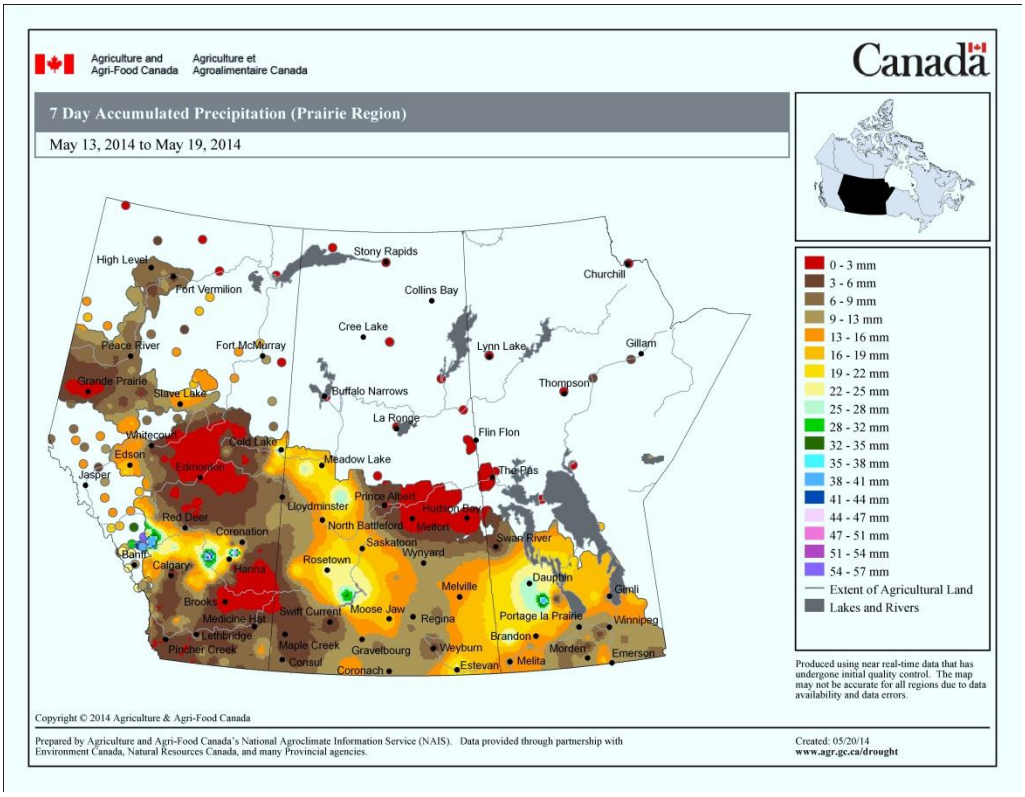
**Otani, Giffen, Weiss, Olfert**

1. **Greetings!** Fields are starting to emerge so field scouting begins in earnest now!

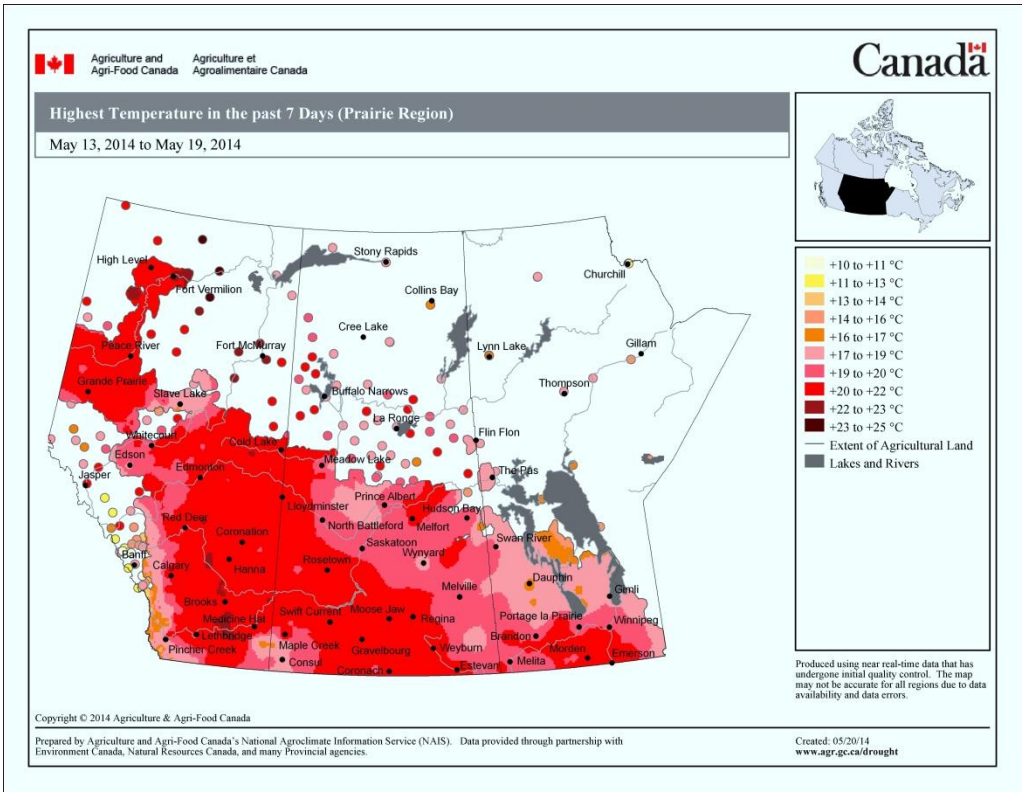
2. **Weather synopsis** – Below is the **Accumulated Precipitation for the Growing Season** (i.e., April 1-May 20, 2014):



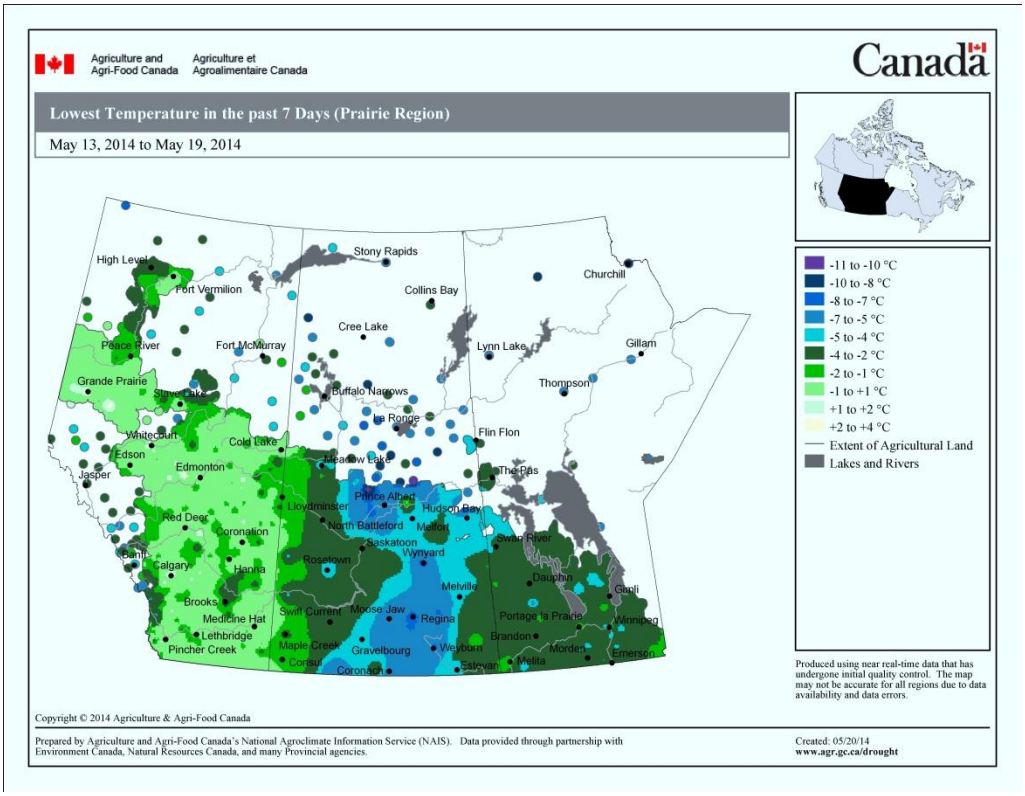

While below is the **Accumulated Precipitation the Past 7 Days** (i.e., May 13-19, 2014):



Slightly warmer this week - just in time to help those newly seeded fields get up and growing. The map below shows the **Highest Temperatures the Past 7 Days** (May 13-19, 2014) across the prairies:




While the map below shows the **Lowest Temperatures the Past 7 Days** (May 13-19, 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**) –RT's, originating in the PNW, crossed over the prairies in the last few days.

| vwQryReversePNWPrairiesDistinctLocations | | | |
|---|---|---|---|
| **LocationID** | **Arriving Date** | **LocLat** | **LocLong** |
| LETHBRIDGE_AB | 20/05/2014 | 49.7 | -112.8 |
| KINDERSLEY_SK | 20/05/2014 | 51.5 | -109.1 |
| UNITY_SK | 19/05/2014 | 52.4 | -109.1 |
| SEDGEWICK_AB | 19/05/2014 | 52.8 | -111.7 |
| REGINA_SK | 19/05/2014 | 50.5 | -104.5 |
| PROVOST_AB | 19/05/2014 | 52.4 | -110.3 |
| OLDS_AB | 19/05/2014 | 51.8 | -114.1 |
| LETHBRIDGE_AB | 19/05/2014 | 49.7 | -112.8 |
| KINDERSLEY_SK | 19/05/2014 | 51.5 | -109.1 |
| BEISEKER_AB | 19/05/2014 | 51.4 | -113.5 |
| LETHBRIDGE_AB | 18/05/2014 | 49.7 | -112.8 |
| BEISEKER_AB | 18/05/2014 | 51.4 | -113.5 |
| VEGREVILLE_AB | 16/05/2014 | 53.5 | -112 |
| UNITY_SK | 16/05/2014 | 52.4 | -109.1 |
| SEDGEWICK_AB | 16/05/2014 | 52.8 | -111.7 |
| OLDS_AB | 16/05/2014 | 51.8 | -114.1 |
| MANNING_AB | 16/05/2014 | 56.9 | -117.6 |
| KINDERSLEY_SK | 16/05/2014 | 51.5 | -109.1 |

The number of PNW RT's were low for the week of May 13-20, 2014. The average number of prairie locations with PNW RT's per day for April was 8.7, compared to 3.2 for the period of May 1-20, 2014 (Fig. 1).

**Fig. 1.**

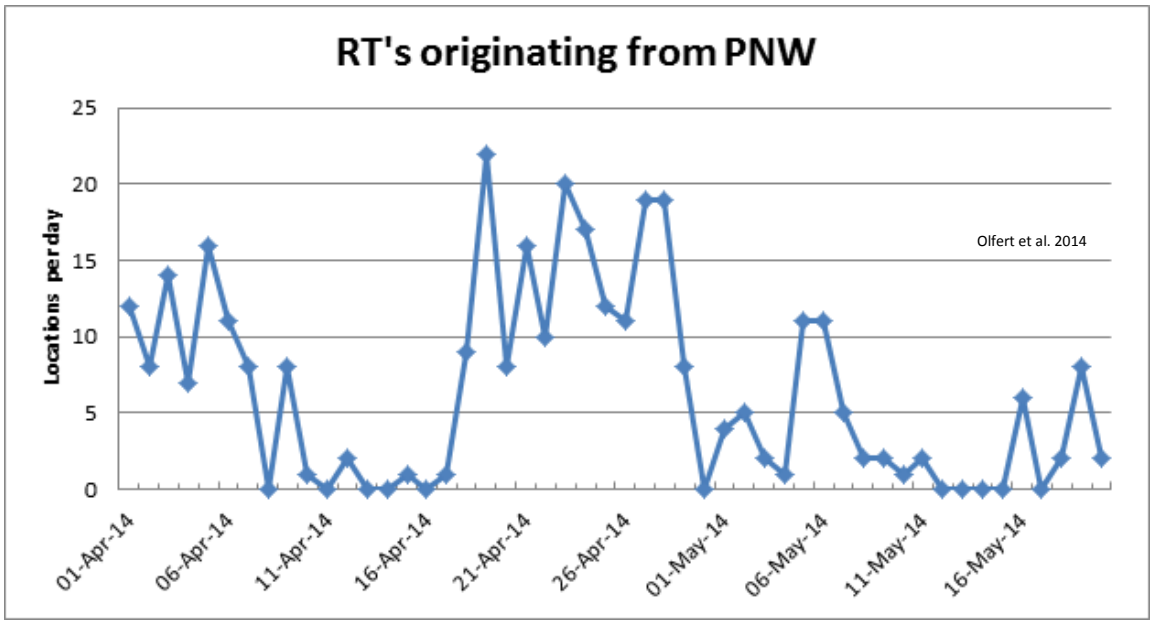
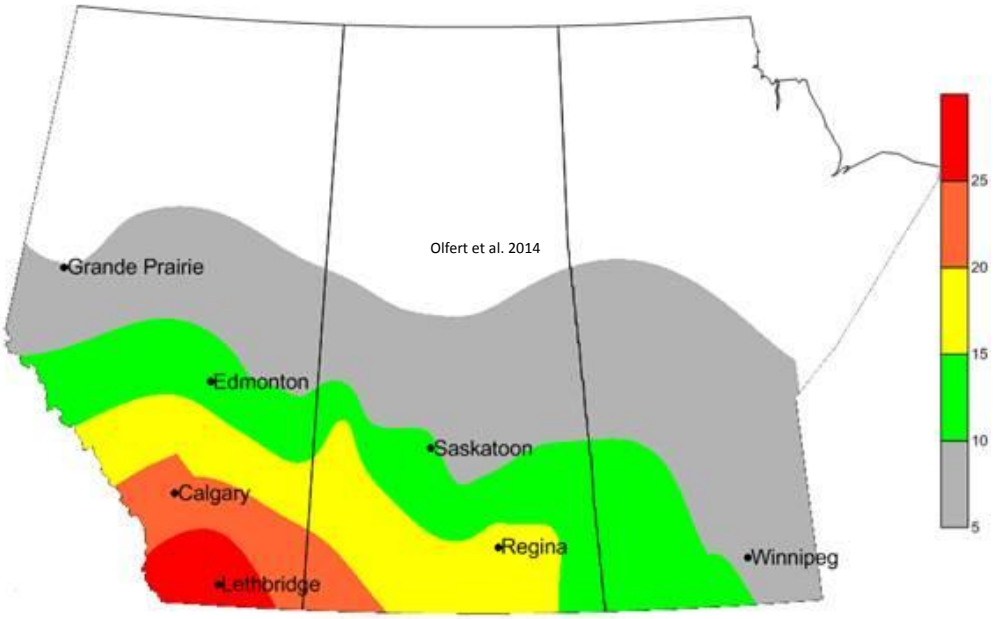


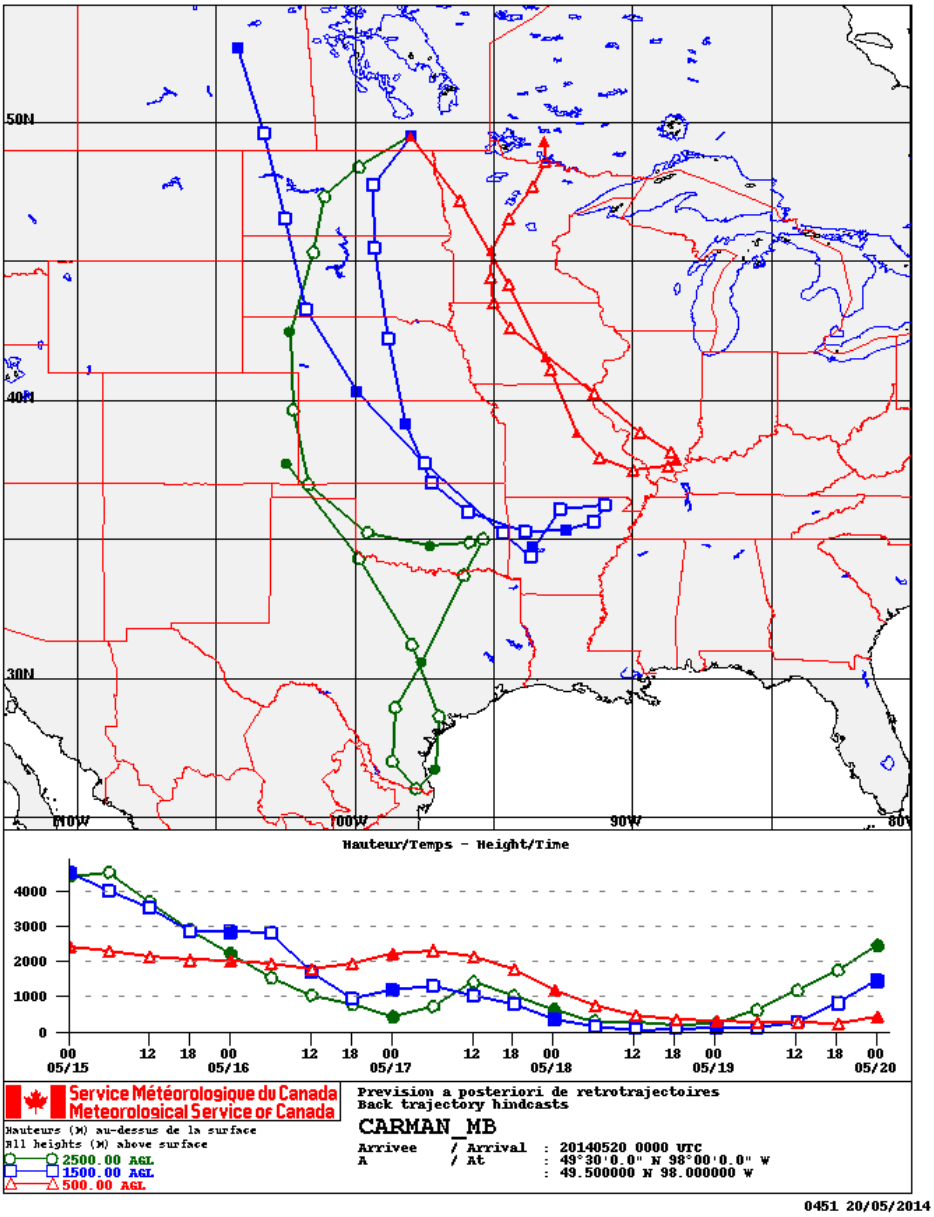

**Fig. 2.** Seasonal total number reverse trajectories originating from US PNW
April 1 - May 20, 2014



**b. Mexico and southwest USA (SW)** – For the first time since April 29, 2014, RT's originating from southwest USA and Mexico have crossed the prairies (Fig 3).

| vwQryReverseDBMPrairiesDistinctLocations | | | |
|---|---|---|---|
| **LocationID** | **LocLat** | **LocLong** | **Arriving Date** |
| SELKIRK_MB | 50.1 | -96.9 | 20/05/2014 |
| PORTAGE_MB | 50 | -98.3 | 20/05/2014 |
| CARMAN_MB | 49.5 | -98 | 20/05/2014 |
| BRANDON_MB | 49.8 | -99.9 | 20/05/2014 |

**Fig. 3.**



***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 | 20/05/2014 |
| EASTERN_WASHINGTON | 20/05/2014 |
| BOZEMAN_MONTANA | 19/05/2014 |
| MANHATTAN_KANSAS | 19/05/2014 |
| MOSCOW_IDAHO | 19/05/2014 |
| TULSA_OKLAHOMA | 19/05/2014 |
| EASTERN_WASHINGTON | 18/05/2014 |
| MANHATTAN_KANSAS | 18/05/2014 |
| MOSCOW_IDAHO | 18/05/2014 |
| TULSA_OKLAHOMA | 18/05/2014 |
| EASTERN_WASHINGTON | 17/05/2014 |
| MANHATTAN_KANSAS | 17/05/2014 |
| MOSCOW_IDAHO | 17/05/2014 |
| TULSA_OKLAHOMA | 17/05/2014 |
| EASTERN_WASHINGTON | 16/05/2014 |
| MOSCOW_IDAHO | 16/05/2014 |
| TULSA_OKLAHOMA | 16/05/2014 |
| EASTERN_WASHINGTON | 15/05/2014 |
| MANHATTAN_KANSAS | 15/05/2014 |
| MOSCOW_IDAHO | 15/05/2014 |

**4. Flea Beetles** (Chrysomelidae: *Phyllotreta* species) – As canola emerges, be on the lookout for flea beetle damage resulting from feeding on the cotyledons but also on the stem (Fig. 4). A reminder that the **Action Threshold** for flea beetles on canola remains **25% of cotyledon leaf area consumed**.

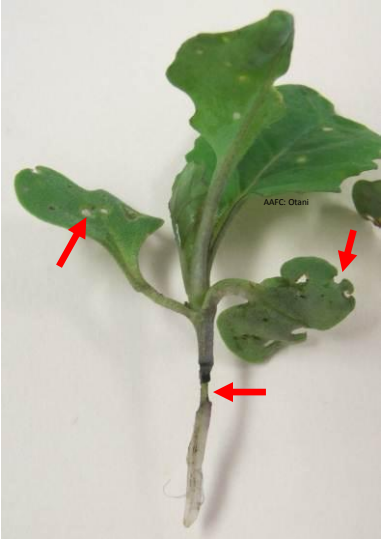



**Fig. 4:** Flea beetle feeding on *B. juncea* plant.


**Fig. 5:** 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:**<br>**Drop samples off or send priority mail to:**<br>Attn: Udari Wanigasekara<br>University of Manitoba<br>Dept. of Entomology<br>12 Dafoe Road<br>University of Manitoba<br>Winnipeg, MB R3T 2N2<br>Phone: 204-474-7485<br>Email: udari_madu@yahoo.com | **In Saskatchewan:**<br>**Drop samples off or send priority mail to:**<br>Attn: Scott Hartley<br>Cutworm Survey<br>Crop Protection Lab<br>Saskatchewan Ministry of Agriculture<br>346 MacDonald St.<br>Regina, SK S4N 6P6<br>Phone: 306-787-8130<br>Email: Scott.Hartley@gov.sk.ca | **In Southern Alberta**<br>Attn: Jeremy Hummel<br>4101 22 Ave S<br>Lethbridge, AB T1K 4Y3<br>Phone: 403-320-3202 ext. 5347<br>Email: jyhmml@gmail.com |
| **In Central Alberta**<br>Attn: Jim BROATCH or Patty REID<br>Lacombe Research Centre<br>6000 C & E Trail<br>Lacombe, AB T4L 1W1<br>Tel. 403-396-2535<br>Jim.Broatch@gov.ab.ca<br>Patty.Reid@agr.gc.ca | **In Northern Alberta**<br>Attn: Jennifer OTANI<br>#1 Research Station Road<br>Beaverlodge Research Farm<br>Agriculture & Agri-Food Canada<br>Beaverlodge AB T0H 0C0<br>Tel. 780-354-5132<br>Jennifer.Otani@agr.gc.ca<br>Twitter: @bugs5132 | **In BC Peace River Region**<br>Attn: Arlan Benn<br>401-114th Avenue<br>Dawson Creek, BC V1G 2Z7<br>Phone: 604-349-3719<br>Twitter @BCPPM<br>Email:<br>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 17ºC) 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. 6:** Dorsal view of adult *S. lineatus* (Photo: H. Goulet).

**Figure 7: Weevil damage consisting of notching on leaves (Photo: L. Dosdall).**

**Figure 8: Weevil feeding notches along perimeter of pea leaves (Photo: L. Dosdall).**

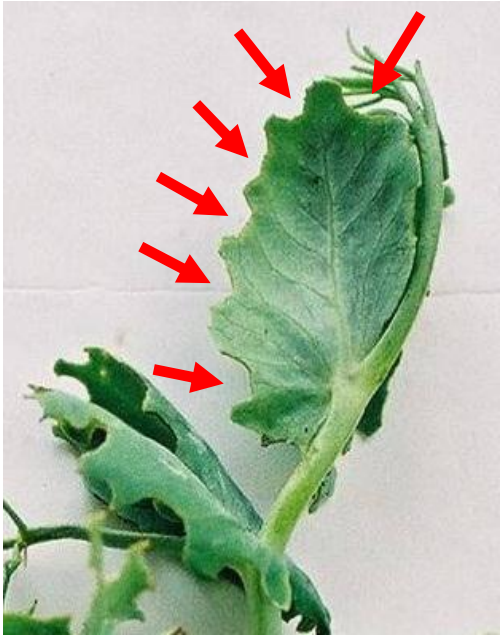


**Figure 9: Pea leaf weevil feeding notches on clam leaf (Photo: L. Dosdall).**

**7. Insect Development and Simulation Outputs –** Cool conditions have 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.

**a. Swede Midge (*Contarinia nasturtii*) –** Model output suggests that pupal development has begun in northeastern Saskatchewan and northwest Manitoba. Current model runs indicate that swede midge emergence could begin in Manitoba and Saskatchewan during the last week of May and into the first week of June.

For those participating in swede midge pheromone monitoring, traps should be deployed in fields this week in order to intercept the initial males emerging from the soil. Remember, swede midge are multivoltine so 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. 10).



**Fig. 10:** 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 may have begun in locations near Lethbridge** (Fig. 11) **and should begin across the southern prairies over this week** (Fig. 12-13)**. Model output indicates that oviposition will be delayed until the first week of June in fields near Swan River, MB** (Fig. 14)**.**

**Fig. 11: LETHBRIDGE AB**

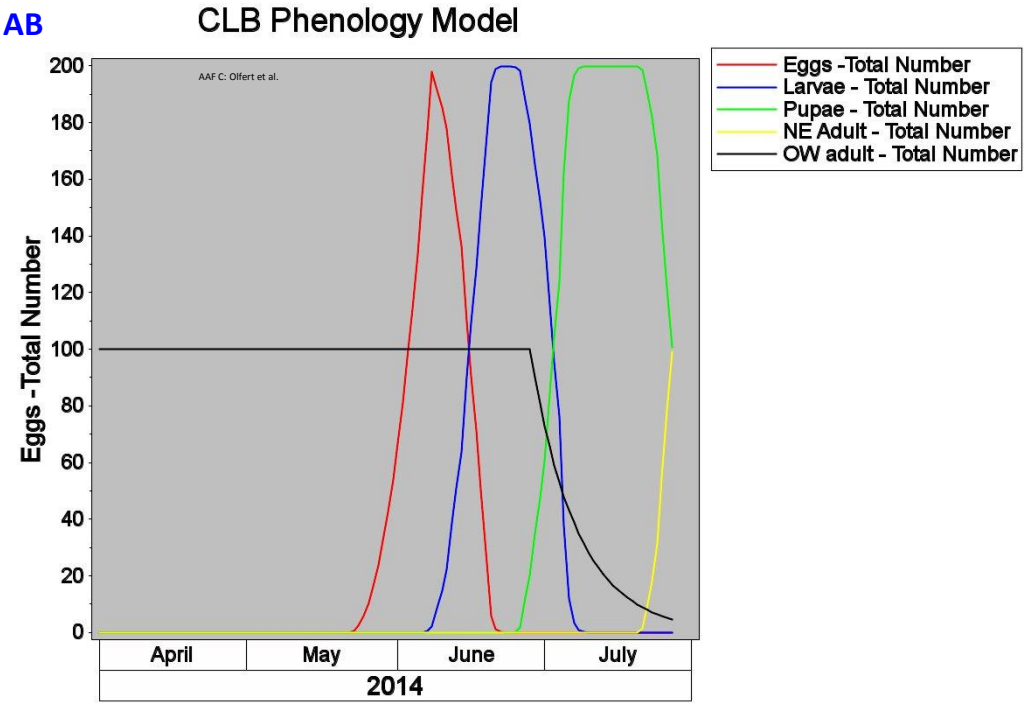



**Fig. 12: MAPLE CREEK SK**

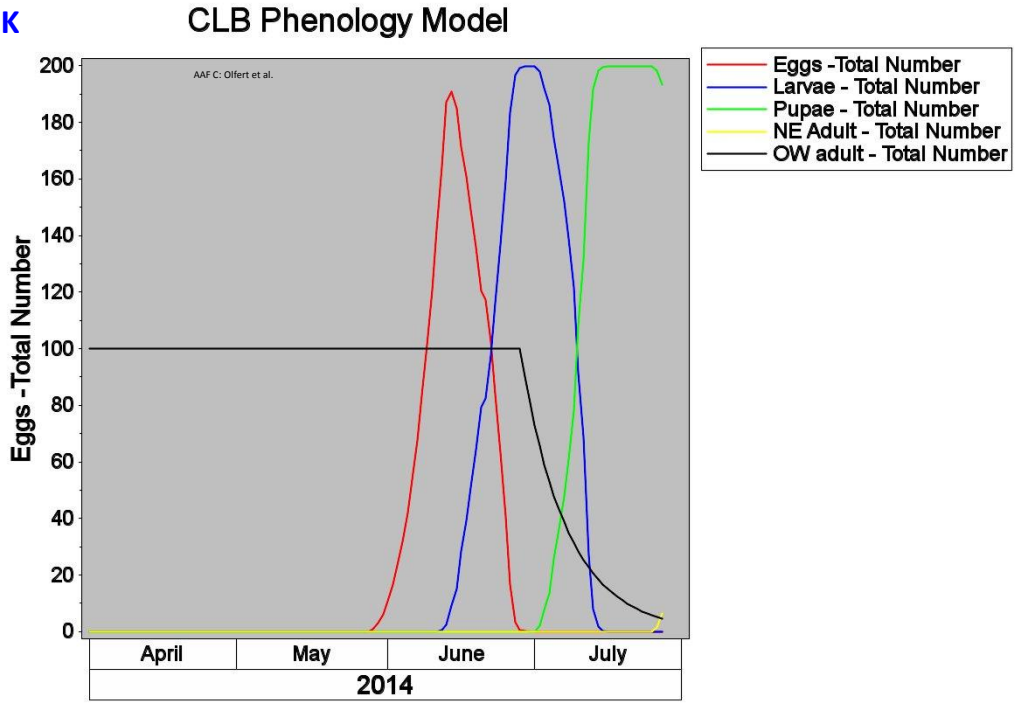


**Fig. 13: YORKTON SK**

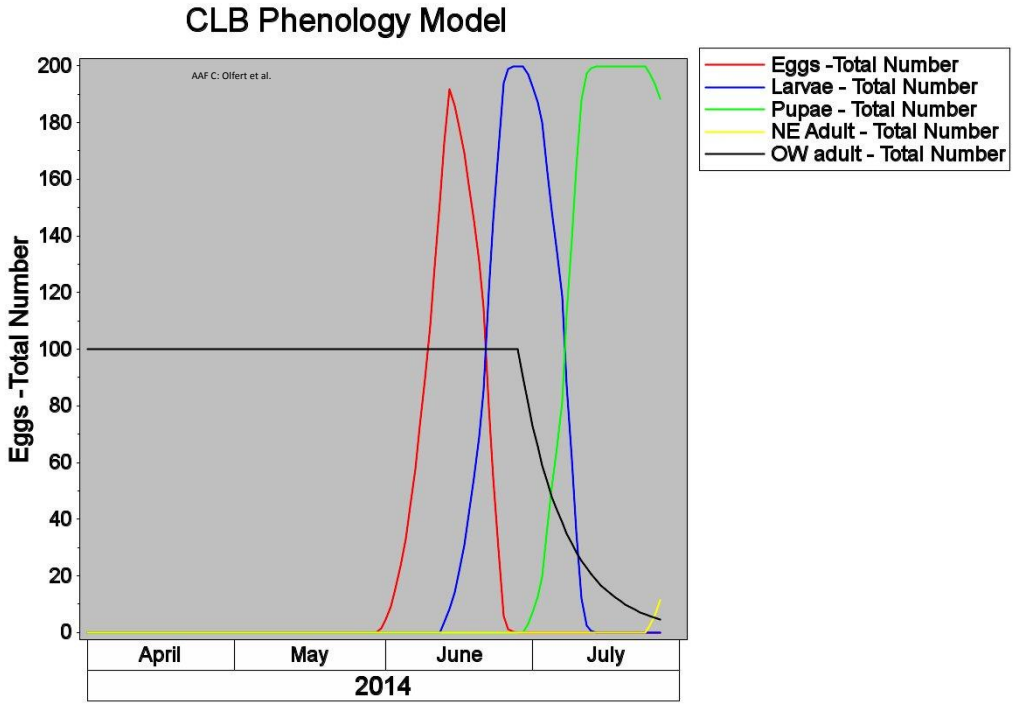
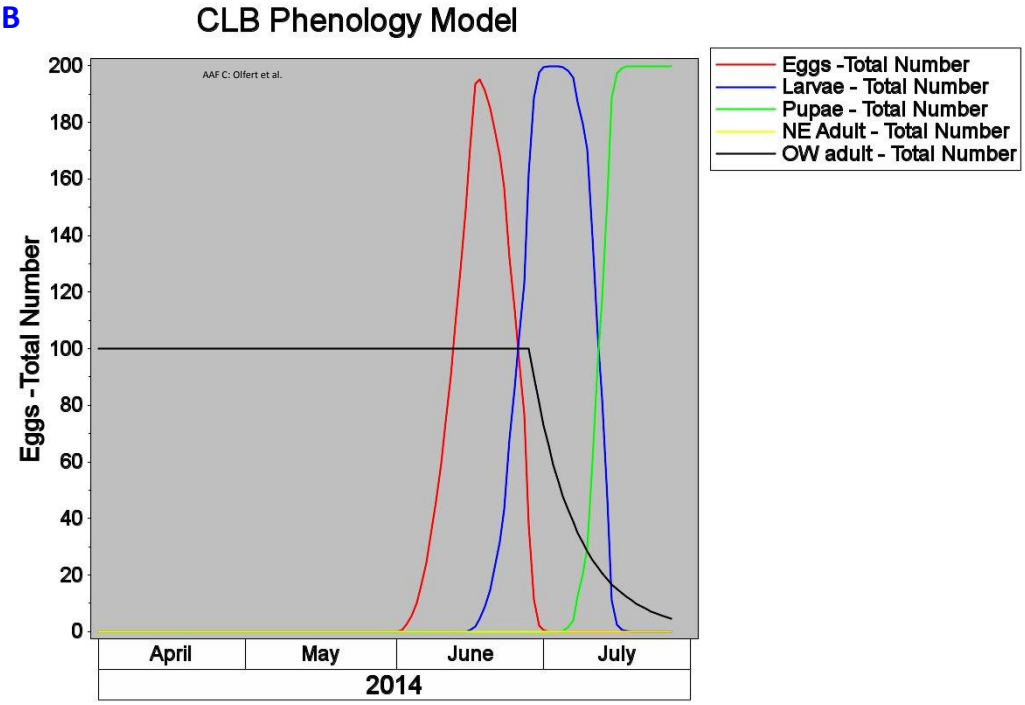
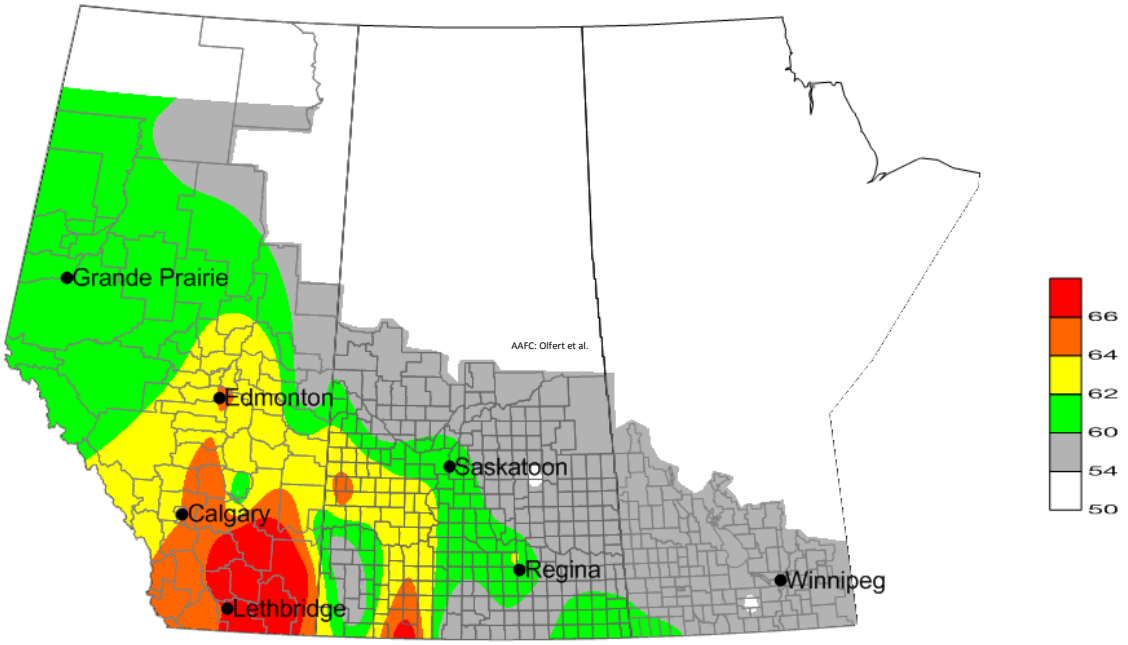



**Fig. 14: SWAN RIVER MB**



**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). Cool temperatures have delayed embryological development. This week the mean embryological development is predicted to be 60%. Last week development was 56%. Average embryological development for this time of year is 68%. Last year (May 19) embryological development was ranged between 70 and 75%. Embryological development can vary widely, not only between locations but also within short distances along roadsides and in fields. First appearance of hatchlings usually occurs when mean embryological development is 75%. Development is predicted to be greatest across southern and central AB. **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. 15)**.**

**Fig. 15.** Grasshopper embryological development (%)
May 19, 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

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.




**Figure 16. *Coccinella septempunctata* (C7) in three insect stages: Adult (left), late larval stage (centre) and puparium attached to wheat (right).**

**10. 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.