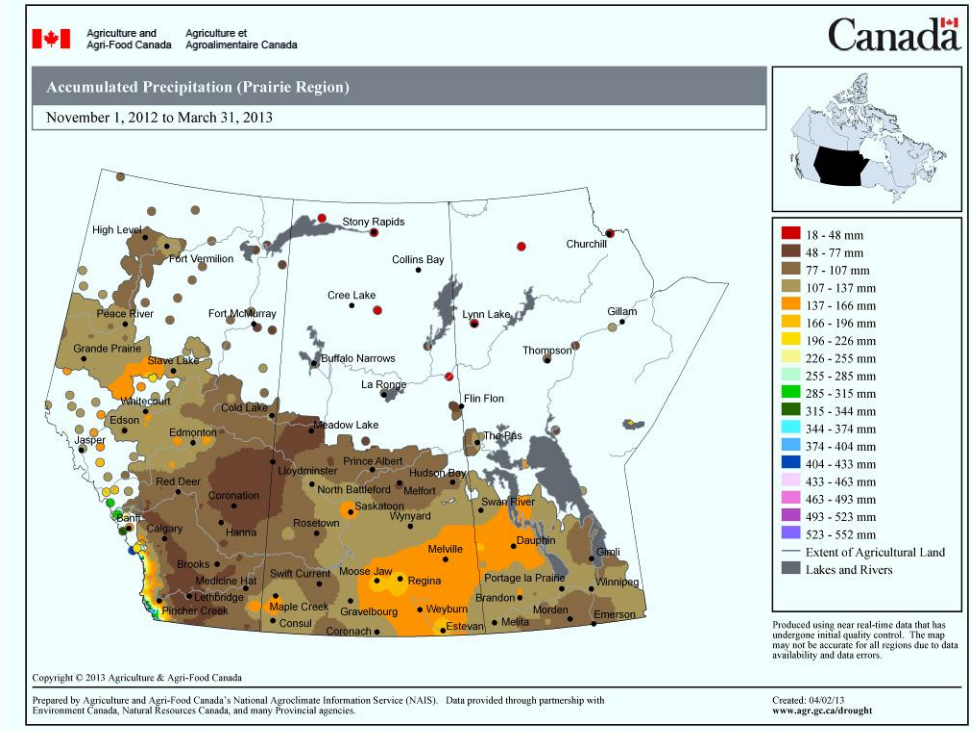
Prairie Pest Monitoring Network Weekly Updates – May 27-31, 2013

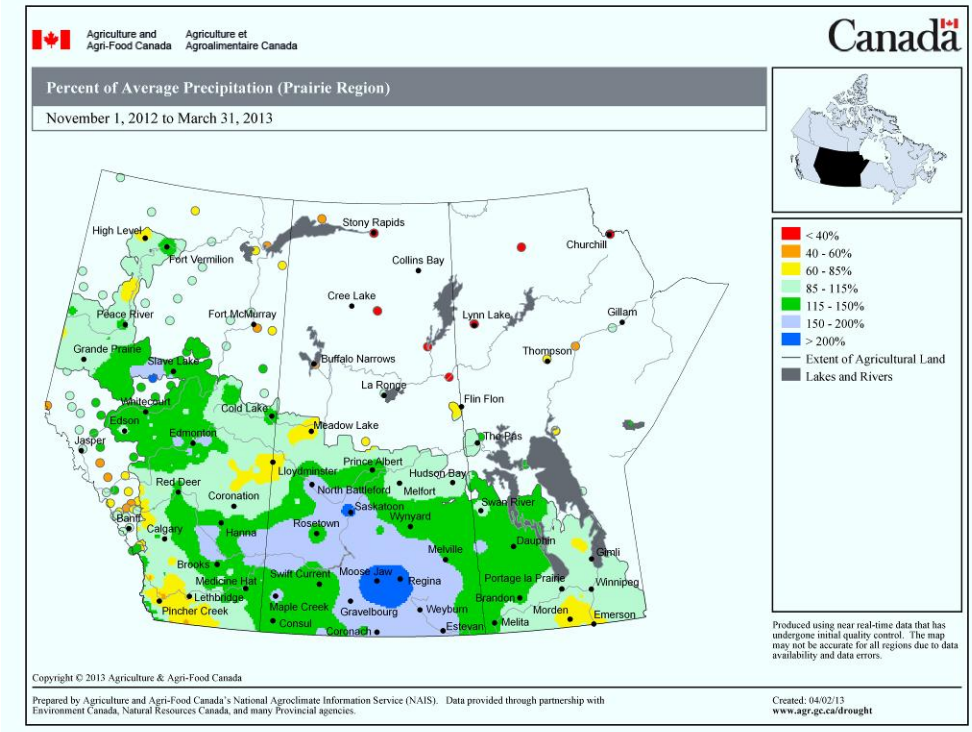
Weiss, Giffen, Olfert – AAFC Saskatoon & Otani – AAFC Beaverlodge

1. Welcome Back! This is the first edition of the 2013 Weekly Update. The field season started earliest in southern Alberta this year with seeders spotted in fields by mid-April. Hopefully seeding can wrap up this week for the remaining fields contending with wet field conditions on the rest of the prairies.

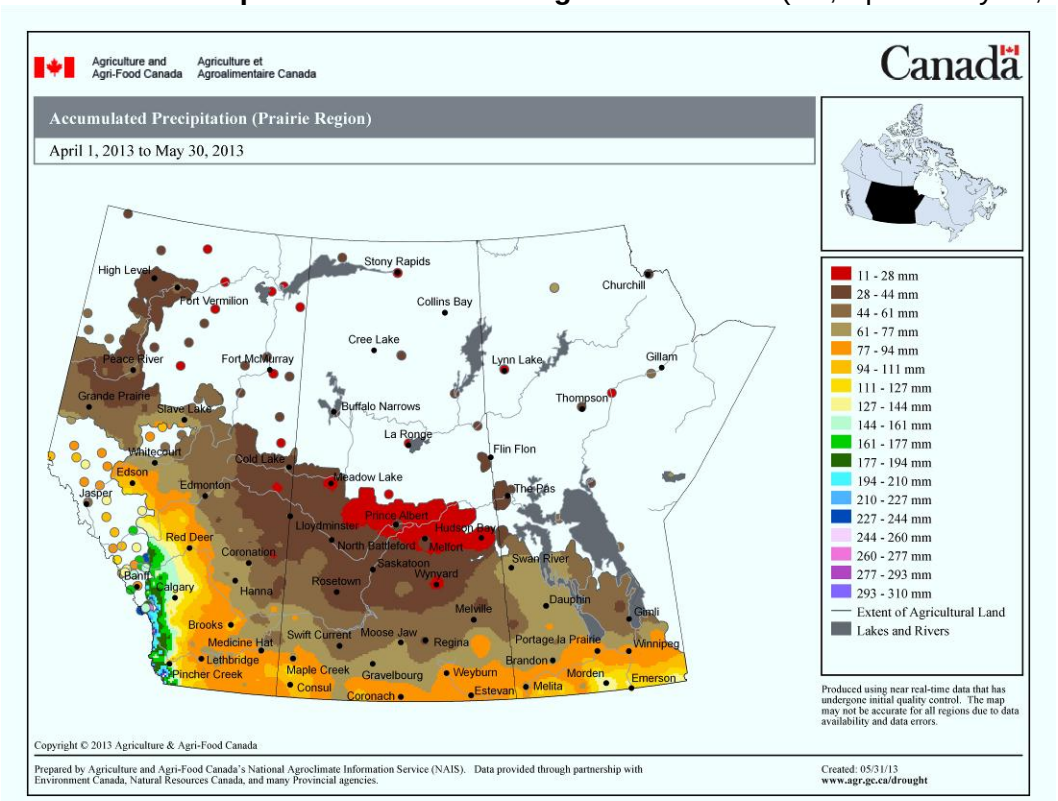
2. Weather synopsis – This past winter started in mid-October and refused to let up. The map below reflects **Accumulated Precipitation received during the winter** (Nov 1, 2012 to Mar 31, 2013) for the prairies.



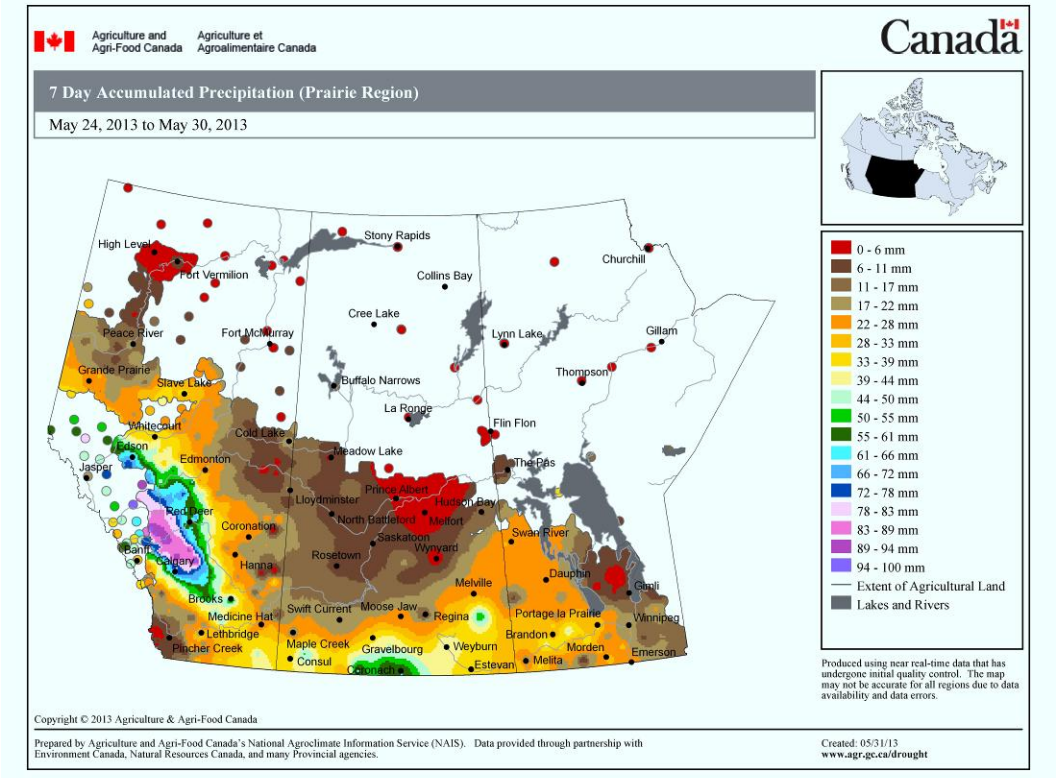
In terms of **Percent of Average Precipitation received during the winter**, the map below reinforces that most of the prairies received >100% of the 30-yr average which affected seeding dates this spring.



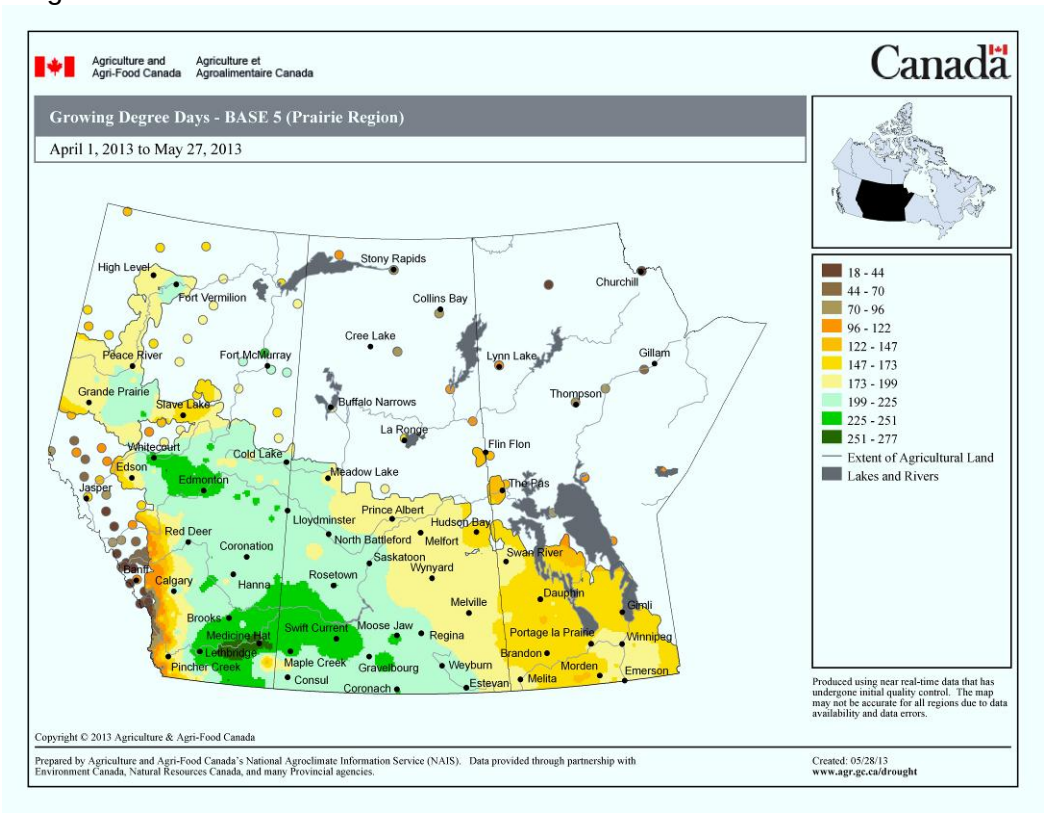
Below is the **Accumulated Precipitation for the Growing Season so far** (i.e., April 1-May 30, 2013):



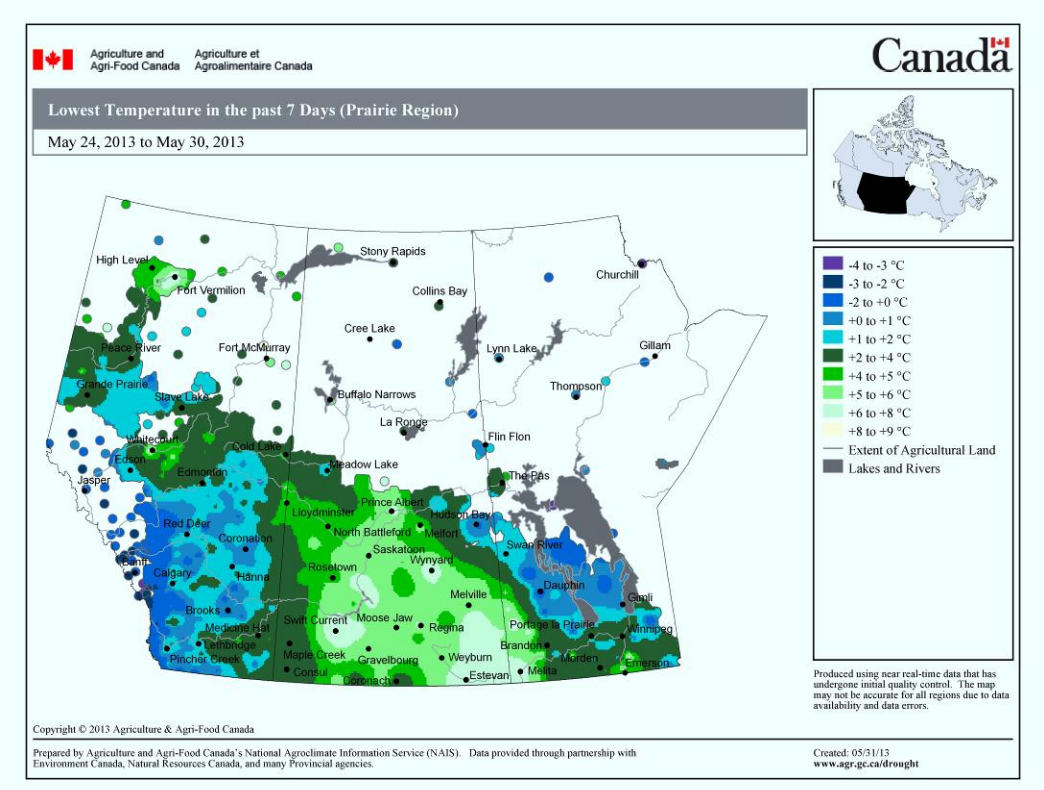
While below is the **accumulated precipitation the past 7 days** (i.e., May 16-24, 2012):



Growing degree day (GDD) (Base 5ºC, April 1 – May 27, 2013) indicates that the growing season, in terms of heat accumulation, is well underway even though seeding will wrap up this week in many regions of the prairies. Producers need to be watchful for insect pests occurring in younger crop stages in fields that had to be seeded later due to snow melt and standing water. In general, arthropod lifecycles are closely tied to environmental temperatures whereas seeding dates are limited by soil conditions. Below is the GDD (Base 5ºC) for the growing season:



And that f-word... The map below shows the **Lowest Temperatures the Past 7 Days** across the prairies:



3. Flea Beetles (Chrysomelidae: *Phyllotreta* species) – A reminder that the **Action Threshold** for flea beetles on canola remains **25% of cotyledon leaf area consumed**. Shot-hole feeding is the traditional damage in seedling canola but watch the growing point and stems of seedlings if fields are experiencing cooler temperature accompanied by wind, rain or even snow during emergence and until the true leaves begin to grow.

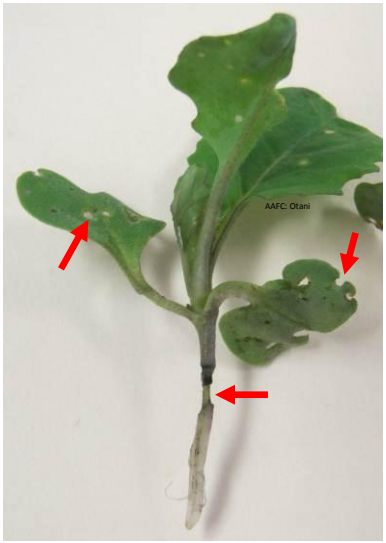


Figure A: Flea beetle feeding on *B. juncea* plant including shot-hole damage on cotyledons and girdling of stem (note red arrows).

Figure B: Striped flea beetle (*Phyllotreta striolata*) measuring ~2.5mm long.

4. Cutworms (Noctuidae) – Cutworm reports started in mid-April from southern Alberta this spring. Army cutworms were the first to be retrieved and several additional fields have reported both damage and cutworm larvae (see AARD's current Cutworm map below). Fields have been sprayed in southern Alberta for cutworm control and this week cutworm reports came from Saskatchewan.

Cutworm biology, species information, plus monitoring recommendations can be viewed by clicking here to access the Prairie Pest Monitoring Network's Cutworm Monitoring Protocol. Also refer to your provincial agricultural website for more information.

Closely monitor newly seeded stands for uneven emergence, missing rows, wilting or yellowing plants. Scout stands that are slow to emerge or appear to be hosting numerous birds. Dig 1-2 inches deep near the base of healthy plants near missing or damaged plants. 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 larvae are needed this spring for research – dead or alive. Refer to the above website for detailed collecting information. Most importantly, please help the following researchers if you are finding cutworm infestations in your region:

In Northern Alberta + B.C. Peace
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

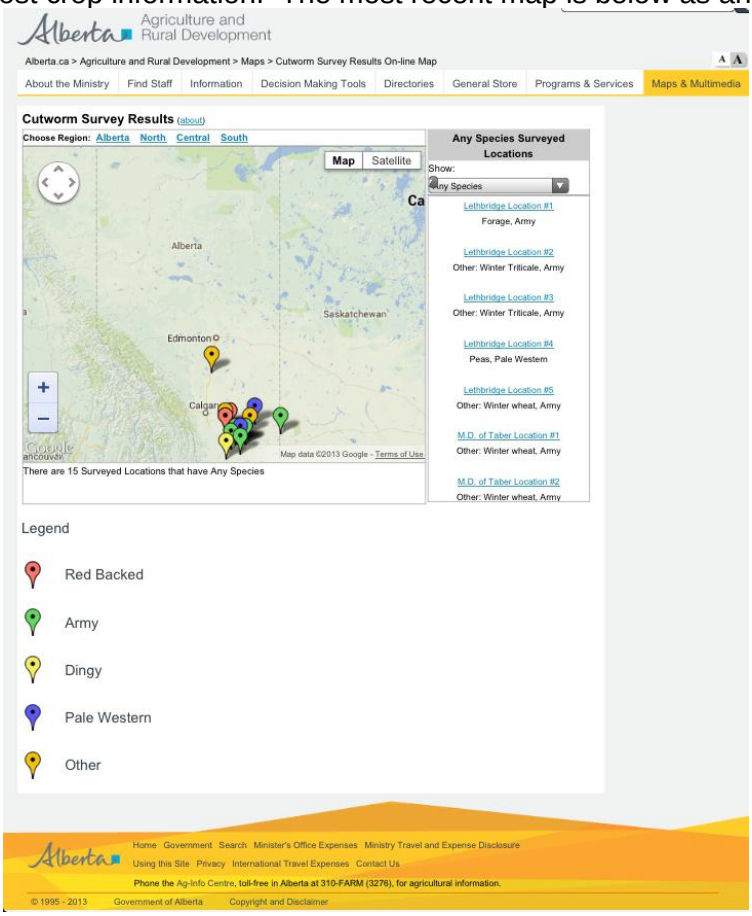
In Central Alberta
Attn: Jim BROATCH or Patty REID
Lacombe Research Centre
6000 C & E Trail
Lacombe, AB T4L 1W1
Tel. 403-396-2535
Patty.Reid@agr.gc.ca

In Southern Alberta
Attn: Jeremy HUMMEL
4101 - 22 Ave South
Lethbridge, AB T1K 4Y3
Tel. 403-320-3202 ext.534
jyhmml@gmail.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
Tel. 306-787-8130

In Manitoba:
Drop samples off or send priority mail to:
Attn: Barb SHARONOWSKI
University of Manitoba
Dept. of Entomology
12 Dafoe Road
University of Manitoba
Winnipeg, MB R3T 2N2
Tel. 204-474-7485

If cutworms are spotted in Albertan fields, please considering using the Alberta Pest Surveillance Network's "2013 Cutworm Reporting Tool" for online reporting located at http://www1.agric.gov.ab.ca/$Department/pestmon.nsf/CutwormWebSubmission Data entered at this website uploads to a live "Cutworm Map" located at http://www.agric.gov.ab.ca/app68/listings/cutworm/cutworm_map.jsp which reflects cutworm sightings, associated species, plus host crop information. The most recent map is below as an example:



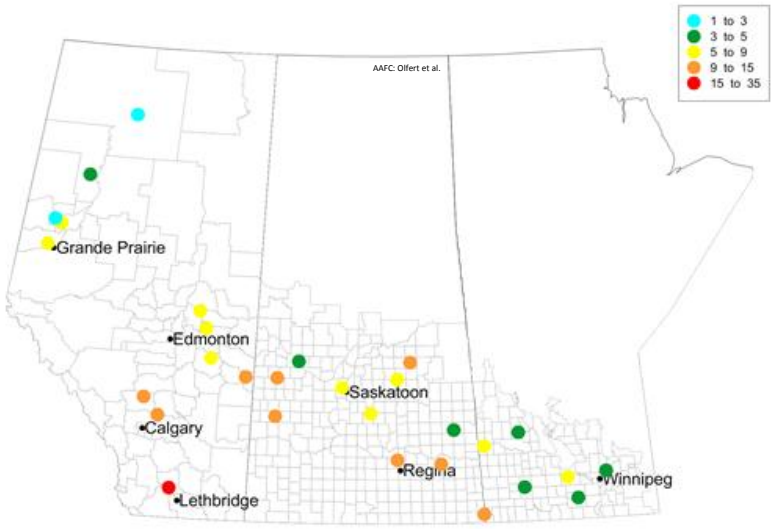
5. Wind trajectories Related to Diamondback Moth (DBM) and Aster Leafhopper Introductions – High altitude air masses originate from southern locations and move northerly to Canadian destinations continuously. Insect pest species such as Diamondback moth and Aster leafhoppers, traditionally unable to 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. Each week, backward and forward trajectories are examined with respect to source and destinations in the following manner.

Three-altitude backward trajectory models (prognostic numerical model GEM [Global Environmental Model]) have been used to forecast potential movement of diamondback moth into western Canada (Braun et al. 2002; Dosdall et al. 2001; Hopkinson 1999). The trajectories utilize wind fields of the Global Environmental Multiscale

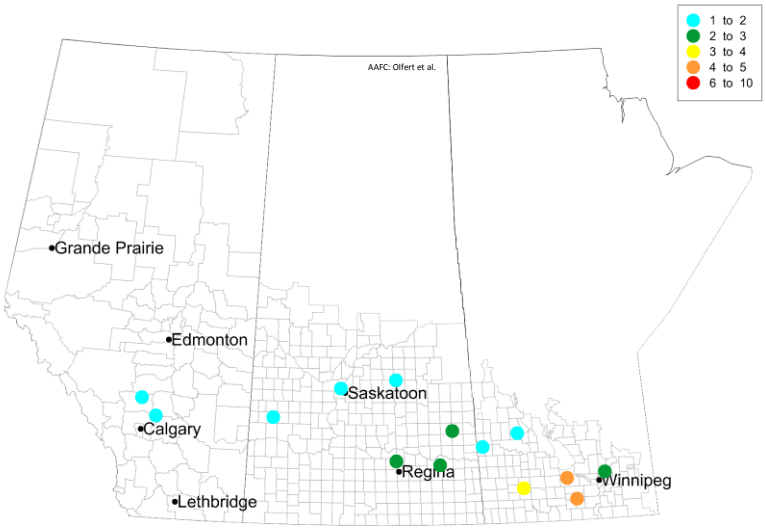
(GEM) model, which have a horizontal resolution of 33 km and 58 vertical levels over North America. The model is being run at three levels corresponding to starting points (forward – prognostic trajectories) or end points (backward – diagnostic trajectories) at approximately 500 m, 1500 m, and 2500 m above ground level (AGL) and follow parcels of air on curves denoting their successive positions in time. The forward trajectories are prognostic based on forecast wind fields while the backward trajectories are diagnostic and based on analyzed wind fields. By following trajectories for air parcels through time, potential wind events that may carry insect pests from source areas in the USA can be identified. Backward trajectories follow a five day time frame backward in time for air parcels moving over at risk locations in western Canada. Backward trajectories forecast where air parcels have come from. Backward trajectory events were computed for specific areas in the USA including the PNW, Texas/Oklahoma region, and the Kansas/Nebraska region.

Until this past week, significantly more trajectories crossing the prairies were originating from the Pacific Northwest (refer to Map A below) than southwestern USA and Mexico (refer to Map B). **Over the last few days there has been an increase in the number of southwestern USA and Mexico trajectories.**

Map A: Seasonal total number reverse trajectories originating from the US Pacific Northwest
April 1 - May 28, 2013



Map B: Seasonal total number reverse trajectories originating from SW US and Mexico
April 1 - May 28, 2013



6. Pea Leaf Weevil (*Sitona lineatus*) – Field scouting and damage assessments began in southern Alberta this past week. Overwintered adult PLW move into pea fields in early spring and begin to feed and oviposit. While the adults are difficult to find, the characteristic feeding "notches" on pea leaves and particularly the clam shell leaf indicate PLW densities. Review the Pea Leaf Weevil Monitoring Protocol by clicking here to find biological and monitoring information for this pest on the prairies. See below for feeding damage photos provided by L. Dosdall (U of A):

Figure A: Pea seedling with weevil damage consisting of notching on leaves (Photo: L. Dosdall).

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

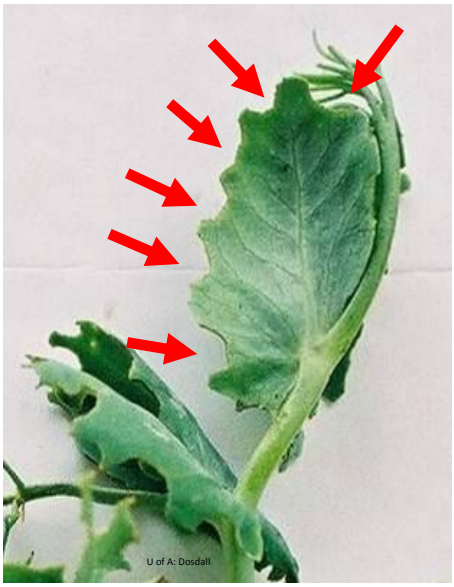
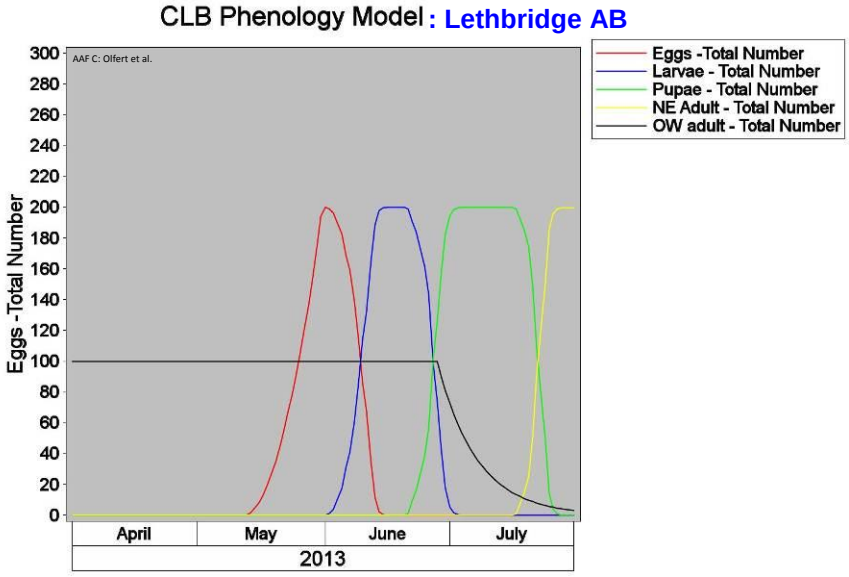
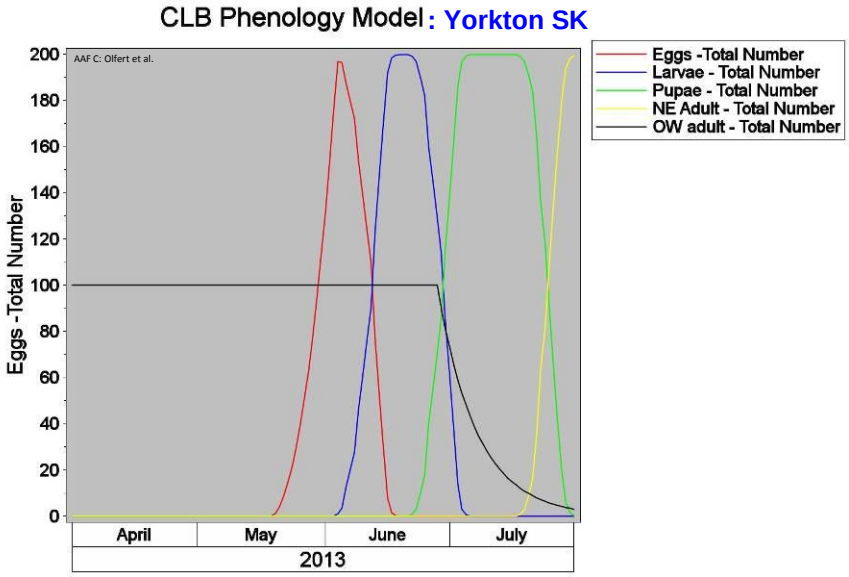


Figure C: Pea leaf weevil feeding notches on clam leaf (Photo: L. Dosdall).

7. Cereal Leaf Beetles (*Oulema melanopus*) – Model output indicates that CLB have begun to oviposit at most confirmed sites across the prairies. Our model output indicates that CLB larvae should begin to appear in early June. Not surprisingly, CLB development in southern AB is approximately seven to ten days ahead of more northerly locations. The following two figures illustrate CLB phenology for Lethbridge and Yorkton. Field monitoring for larvae and feeding damage should be timed to overlap with the larval population curves on the following phenological model graphs:

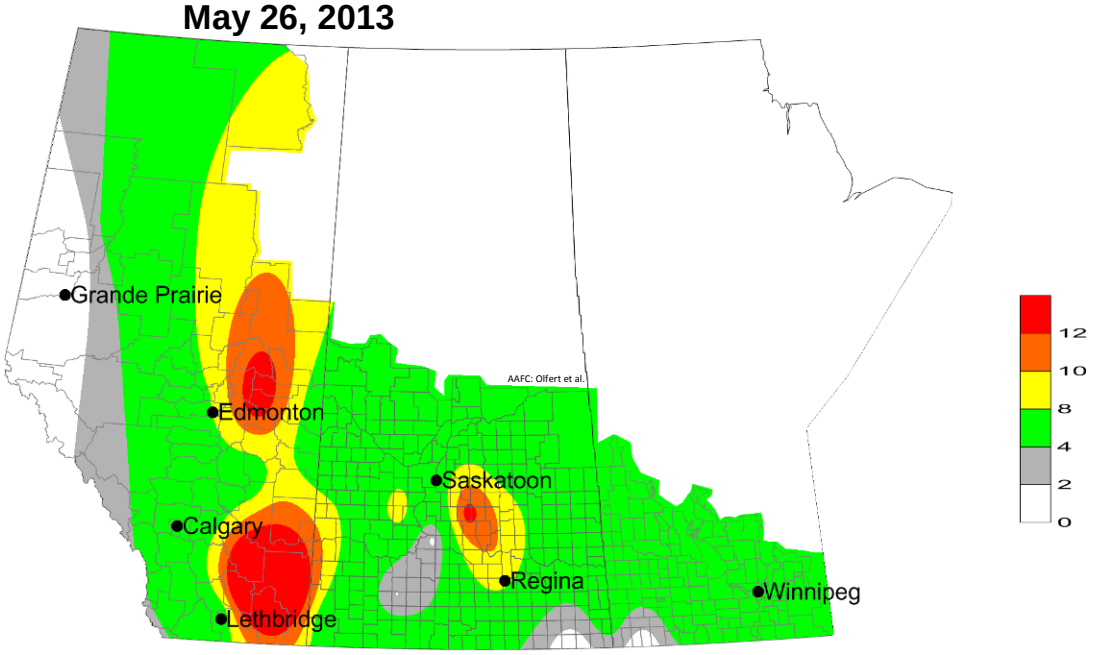




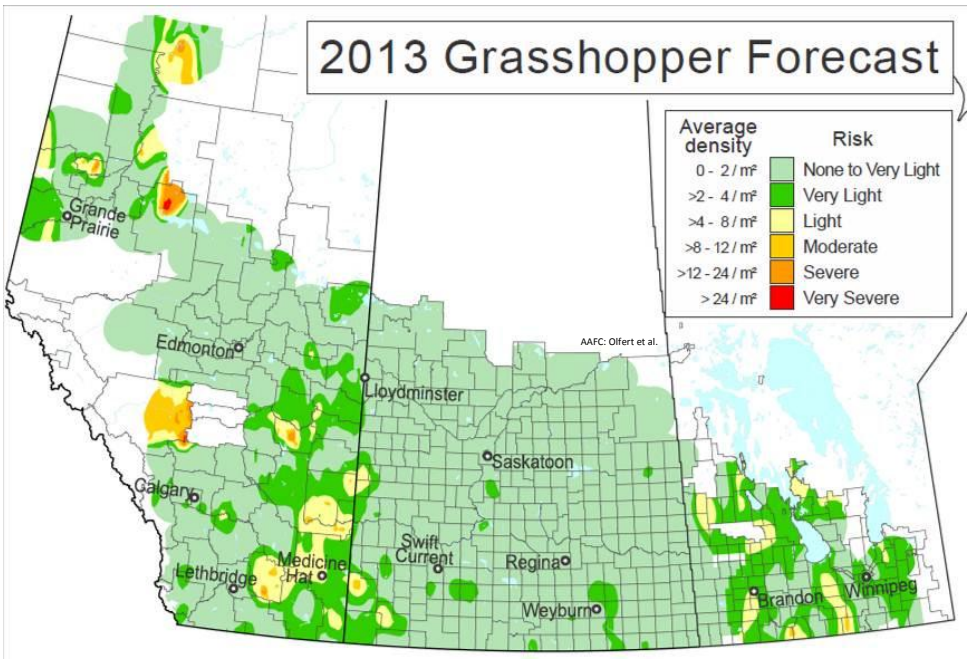
8. Grasshopper Simulation Model Output - As has been the case in previous growing seasons, we will be using our grasshopper simulation model to monitor grasshopper development across the prairies. Weekly temperature data collected across the prairies is incorporated into the simulation model which calculates estimates of grasshopper development stages based on biological parameters for *Melanoplus sanguinipes* (Migratory grasshopper). The simulation model is developed from grasshopper data collected on the Canadian prairies the past 60 years.

Over the past week, warmer conditions resulted in a marginal increase in grasshopper egg development. The model predicted egg development was greatest in Alberta and central Saskatchewan (areas highlighted in red and orange in map below). The model predicted that grasshopper hatch is just beginning in most locations. This was corroborated by the fact that last week, the first hatchlings of the season were collected in Saskatchewan fields.

***M. sanguinipes* Hatch (%)**
May 26, 2013

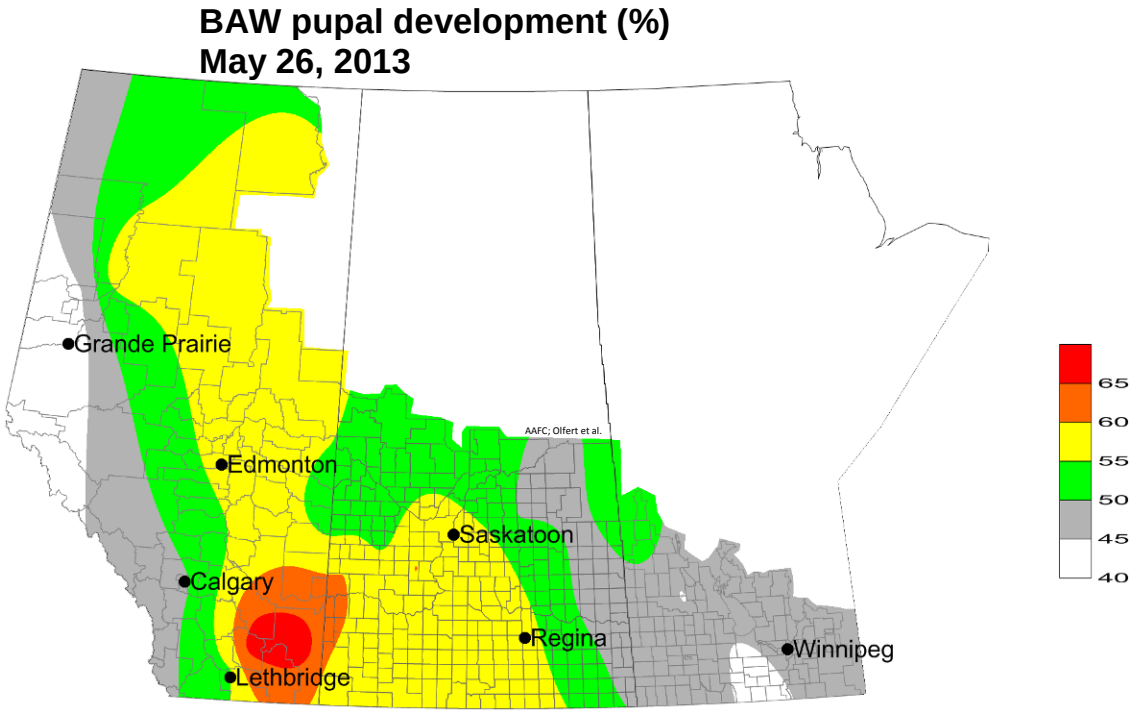


Here's a reminder of what the **2013 Grasshopper Forecast Map** looks like for the prairies:

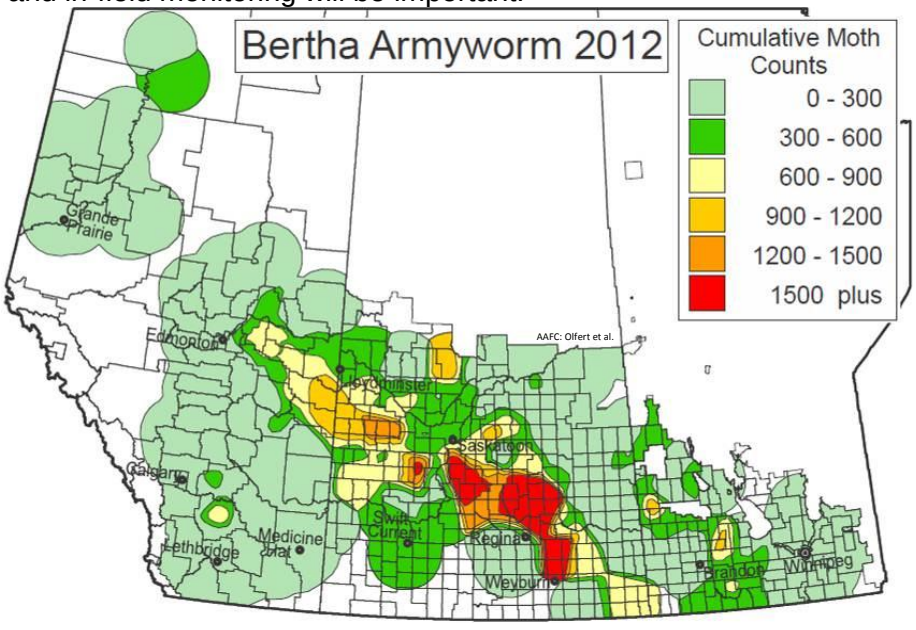


9. Bertha Armyworm (*Mamestra configurata*) - Pupal development for BAW is estimated in map form below with the data being based on current weather conditions and the known biological parameters for the overwintering pupae. The map below indicates the percentage of heat requirements acquired for pupation (e.g., moth emergence occurs at 100% of heat requirements). The mean pupal development across the prairies is 54% with the most advanced pupae predicted to be in southern Alberta and southwest Saskatchewan (areas in red and orange).

REMINDER: Cooperators intending to set out pheromone traps should plan to position traps in fields **by at least 60% of heat requirements** in order to accurately estimate moth populations and to intercept the all-important peaks for mapping and risk assessment in 2013. So, if you're in the red or orange areas, please plan to deploy traps this week.



The following map shows the geographic distribution of BAW pheromone trapping data for 2012. Higher numbers of BAW males were collected over a larger geographic area in 2012 compared to 2011 on the Canadian prairies. For 2013, the distribution and numbers of BAW are again anticipated to increase so pheromone trapping and in-field monitoring will be important.



10. Questions or problems accessing the contents of this Weekly Update? Please e-mail Jennifer.otani@agr.gc.ca or call 780-354-5132.