Crop Weather
Rainfall, temperatures, degree-days and other current and historical weather data for a spot about two miles west of Lamberton, MN can be found at the University of Minnesota Southwest Research and Outreach Center (SWROC) website: http://swroc.cfans.umn.edu/WeatherInformation/index.htm.

As of July 29, we were at 1441 degree-days (Base 50/86 °F). The long-term average is 1516 DDs for this date. The cool weather slowed accumulations. We picked up 86 degree-days the week of July 23-29. More disturbing is the zero point zero inches of precipitation over the same period. Light soils and soils with sand or gravel lenses underneath have lost corn yield. Areas with heavier soil or more rain are faring much better. Some of you are watching some decent crops developing.

Corn maturity
Most corn is pollinating at a high rate of speed now. Corn silks emerge a couple days after the tassel. Regardless of relative maturity rating, it takes 60 days (give or take a few) from silk emergence to black layer (physiological maturity) in field corn.

Corn silks detach after an ovule (future kernel) is pollinated. If you are too impatient to wait for kernels to form, you can check for pollination a few days earlier. Carefully unwrap the husks and shake the developing ear. The silks will fall off any pollinated ovules.

Corn rootworms
I know it is a necessary part of corn production but I am not fond of corn pollen.
Western corn rootworm beetle emergence is underway and females are starting to appear. We will be digging and rating roots from a couple trials this week. Many of you have also been examining corn roots. Based on what I have been seeing and from talking to others, damage may be lighter than last 2012.

Northern corn rootworms have been scarce in SW MN the past couple of years. They are not extinct and it might pay to look at beetle populations in fields not planted to a rootworm hybrid.

I looked at a couple of Redwood County fields with notable populations of extended diapause northern corn rootworm. One field averaged or 4 beetles or more/plant or so with some roots pruned. Beetles were still emerging. Egg-laying females were also observed at the base of some plants in this field. These fields were not planted to a rootworm hybrid this year or two years ago. They may have attracted beetles from nearby field of early maturity field corn or sweet corn in 2011.

More flea beetles

I have been getting a few more questions on these insects in corn and soybeans. They are more abundant than usual this year.

Typically, flea beetles are not a concern on larger corn. An old friend found some unusual symptoms on corn leaves in a Rock County field. While not economic, red-headed flea beetle damage was definitely unusual. Lower leaf feeding was evident in portions of the field and beetles were numerous enough to cause minor silk clipping.

These small beetles have hind legs modified for jumping. The size and jumping behavior are the basis for the name flea beetle.

Corn aphids

We started seeing a few very scattered, small corn leaf aphid colonies in SW MN over the past week. Unlike bird cherry-oat aphid, this species tends to colonize upper portions of the corn plant. They are not anywhere near levels that should cause any excitement.
Spider mites
We located a small colony of two-spotted spider mites near a grove at the SWROC. We had been actively looking since spring. Somewhat unusual, this infestation affected the upper leaves only (right).

This mite population was nowhere near economically important but it is a reminder to be careful when scouting and making insecticide decisions in corn and soybeans during hot dry weather.

Twospotted spider mites are favored by high temperatures and drought stress. They are very susceptible to natural enemies, fungi of the genus *Neozygotes* in particular. Cool temperatures and consistent moisture, including heavy dews, can trigger fungal disease outbreaks

Twospotted spider mite resistance to the insecticide chlorpyrifos (Lorsban etc.) was documented at the SWROC last summer. We are currently working to determine how widespread this resistance is within Minnesota.

These are not soybean diseases

Reddening occurs when the underside of soybean leaves are exposed to bright sunlight (left). The leaves on the right might be the result of one too many spray adjuvants added to the tank.

Soybean aphids
Scattered fields have been treated or are near economic threshold levels. These are most likely smaller fields. Low aphid populations seem the norm in most fields.

The second half of the season
The hotspots in many fields have dispersed over the past week.
Winged aphids deposited one or two nymphs on plants as they colonized new fields. These nymphs are now starting to produce offspring. These newly colonized fields are more uniformly infested. Aphids colonizing new fields are free, at least temporarily, of their annoying predators.

Scouting is more time consuming now. For the most part, aphids are still concentrated on developing new growth but this new growth and aphids are found increasingly on branches lower in the canopy.

The R5 stage of soybeans signals changes for soybean physiology and aphids both. This is the beginning seed stage (a 1/8 inch seed is present in a pod at one of the upper four nodes). Soybean root growth and leaf vegetative growth cease in mid-R5. Aphids will no longer consistently found on the upper leaves. As the soybean plant progresses into R5, aphids tend to be found in the middle canopy and around pods and many aphids can be small and pale at this time.

As fields approach 50% plants infested with aphids, they should be moved up on the scouting priorities list. As they near 80% of the plants infested, you can start estimating when the field will reach 250 aphids / plant. They can be slowed by weather of natural enemies. I use 2-3 day doubling times to be on the safe side.

The 250 aphid/plant economic threshold applies through R5. Late in the season, aphid reproduction can be quite rapid on R6 soybeans. R6 is the full seed stage where a pod in upper 4 nodes has a seed filling the cavity. While yield impacts from aphids are probably less as soybeans mature, treating increasing populations at 250 through R5 will minimize unexpected surprises in September. Walk away from fields as leaves begin to senesce or yellow pods are observed.

How does cool temperature affect soybean aphids?
University of Minnesota based research determined temperature requirements of the soybean aphid.

Soybean aphids live longer and have a higher reproductive rate at cool temperatures, producing more offspring. A generation is completed more rapidly in warmer temperatures. In the lab experiment, soybean aphid nymphs died when held at a constant 95 degrees F. Reproductive rate and generational time are maximized at temperatures in the upper 70s and low 80s with the optimum temperature calculated to be 82° F. With optimal temperatures and no natural enemies, laboratory aphid populations can double in 1 1/2 days.

Remember, the temperature where the aphid is located, not air temperature, is what is important. Aphids can move around the soybean canopy to find suitable more temperatures.

We will be having temperatures favorable for rapid aphid increases. One caveat is that aphids seem to do poorly on drought-stressed soybeans.
Oh really?
I heard from a colleague to the north that some growers have discovered the reason for this year’s currently low aphid populations - the widespread use of seed applied insecticides.

I can list several uninteresting environmental and biological reasons to explain low aphid populations. However, if the seed insecticide claim were true, we are on the cusp of an exciting new era in aphid management. Profit oriented soybean growers could save the seed treatment expense and expect low aphid populations, courtesy of their seed-treating neighbors.

This is the inverse of a strategy that was rumored to be used by some corn growers. They used their neighbor’s corn fields for Bt refuge.

Black cutworm - round 2
Larvae from the second 2013 generation of black cutworm were abundant in a Sibley county field. Karl Nesse found a huge population of small black cutworms in replanted soybeans. Yes, “huge” is an overused adjective but I went to look at the field and huge is the correct choice. The cutworms were just starting to cut petioles. The peaty area where the cutworms were found would have been attractive to their moth grandparents migrating into Minnesota this spring.

This does not signal a major cutworm outbreak. It is interesting in light of the low number of black cutworm problems in corn this spring.

In a nearby soybean field, second generation green cloverworm moths were abundant.

Stinkbugs
We are seeing stinkbug eggs (left) in soybeans recently.

Barrel shaped stinkbug eggs are laid in clusters. The eggs darken as they age. The crown-like spines on the tops of the eggs are distinctive.

Bob Koch, U of M Soybean entomologist, is developing a soybean stinkbug research program.

Horned spanworm
Josh Brusven found this caterpillar while scouting soybeans.
It likely dropped onto his four-wheeler while he was cruising near some trees. The horned spanworm caterpillar feeds on a variety of trees and other broadleaf vegetation. As far I know, spanworms do not damage soybeans.

The four tentacle-like dorsal appendages near the front of the caterpillar are harmless. Off hand, I don’t know what the function of these appendages but based on the photo, it looks like this agriculturalist was not about to take any chances with his captive.

Pesticide resistance
The University of Minnesota would like to hear of soybean aphid and spider mites that are poorly controlled by insecticides. We will test them for insecticide resistance levels.

Happy trails,

Bruce Potter

IPM Specialist SW MN
University of Minnesota Southwest Research and Outreach Center
23669 130th Street
Lamberton, MN 56152
Phone: 507.752.5066  Cell: 507.276.1184  Fax: 507.752.5097
E-mail: bpotter@umn.edu
http://swroc.cfans.umn.edu/ResearchandOutreach/PestManagement/index.htm

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