Cropping Issues in Northwest Minnesota

August 3, 2010 / Vol. 7 Issue 10

Topics of Interest...

2010 Polk County Soybean Variety Plot Tour

Monday August 16

Tour begins at 10:00 am

Lunch buffet to follow at Minakwa Country Club, Crookston, MN

Speakers for the day are Russ Severson and Ian MacRae along with seed representatives. They will review the plot which contains:

- 50 RR varieties and 20 food grade
- 10 planting dates with 2 varieties
- IDC plots with Soygreen

Directions to Tyler & H.D. Ross Farm

1 mile west of Minakwa Golf Course; SE corner of the intersection of Polk County CR61 and US Hwy 75 SW.

Sponsored by the Polk County Soybean Growers and University of Minnesota Extension

University of Minnesota Extension
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NWROC
Northwest Research & Outreach Center

Soybean Aphid Update: ***Northwest and West Central Minnesota***

We are at the time when winged aphids (figure 1) disperse from infested fields and relocate to other soybean fields. These flights can be long or short distance. Throughout northwest Minnesota we are observing winged aphids on the tops of plants in the fields we are scouting. We suspect you'll find the same thing when looking. These flights have often been very large in previous seasons. First impressions of this migration flight is that it might be rather modest. Presently we are finding only a few, two to five winged aphids, on the plants. Are we just early in the flight? Will many, many more follow?

Figure 1. Soybean aphid. A nymph developing wing buds (left with arrow) and a winged adult, or alate (right).

A few more reports of fields being treated are being received. Near Underwood in Otter Tail County, some fields are actually receiving their second treatment following early infestations at the beginning of July. These fields were producing numerous winged aphids prior to being sprayed last week.

Along with the few reports of treating, there are many more reports of fields whose aphid populations are well below threshold. Fields scouted late last week in what would be described as prime aphid sites (e.g., small fields, wooded areas on the edge, buckthorn present) had low populations of aphids. Aphids can be found on a high percent of the plants, but the numbers per plant were well below 100. Most aphid colonies were small, numbering below 10. A lot of aphids were observed whose colony numbered only 2 or 3 individuals. Movement to lower stems, leaves, and pods has begun.

Given the potential for immigration over the next week and the arrival of temperatures that will favor soybean aphid population growth, it is vitally important to keep track of what populations are doing.

Some points to remember…

- Remember the threshold of 250 aphids/plant when >80% of the plants have aphids is an average across the field – sample enough locations to get a good picture of field populations
- Resist the temptation of spot treating hotspots within fields, typically you'll just have to go back later to spray the rest of the field.
- If you treated earlier, don't assume the field is safe for the rest of the summer, keep an eye on previously treated fields as well.

A few fields that had numbers approaching threshold fell this week. Aphid mummies, fuzzy black ones and brown ones, have been reported (figure 2). The fuzzy black ones are likely the result of a fungal disease – this is a good thing. Once a field becomes inoculated with these fungi, it is less likely aphids will colonize that field. The brown mummies have been parasitized. Small wasps have laid their eggs in or on the aphid, the eggs hatch and the wasp

Figure 2. Clockwise from upper left: lady beetle larva, lacewing larva, aphid mummy and fungus-killed aphid.

larvae basically eats the aphid from the inside out leaving just a hallow husk (the exoskeleton of the insect). Bring this conversation up at the dinner table, families should share knowledge…

We are also seeing some alates developing in our own fields. It's relatively easy to spot the developing winged aphids, the nymphs will have what looks like shoulder pads (figure 1), squared off shoulders instead of rounded, sloping shoulders. These aphids, once adult, will have wings and they too will disperse, lowering the population in a field. It's another way field populations can crash quickly.

Finally, we're seeing the development of white dwarf aphids. This is early for this morph of soybean aphids, we generally see these individuals later in August. But many fields are ahead in soybean development as well. However, I've seen some of these morphs in later planted, younger soybean fields as well.

Overall, an interesting time to be working with aphids. **Keep scouting…..**

Phillip Glogoza and Ian MacRae
University of Minnesota Extension

Sudden Death Syndrome of Soybean: *Favorable Conditions and Request for Samples*

Though NW MN lacks confirmation of sudden death syndrome (SDS), this growing season has been favorable for development of SDS in Minnesota. In areas where it is established, the disease is developing earlier than normal in my research plots in Waseca, and I expect it to become obvious soon in many soybean fields. The earlier it develops the more potential it has to cause significant yield loss. SDS has been spreading and we are requesting help to determine where it occurs in Minnesota. SDS has been concentrated in south central Minnesota in past years, but it ***could*** occur almost anywhere in the state.

The following conditions favor development of SDS:

(1) planting early or a period of cool wet soil after any planting date,
(2) heavy and frequent rain in June and July,
(3) compacted soil and poor drainage,
(4) high yield environments; this disease readily damages plants that are growing well,
(5) fields with high levels of the soybean cyst nematode (SCN),
(6) susceptible soybean varieties, however, no varieties are completely resistant to SDS, and
(7) fields where SDS has occurred before and the fungal pathogen (*Fusarium virguliforme*) is present in the soil.

These conditions match what has occurred in many Minnesota fields this year. Keep in mind that this disease is spreading and it will likely appear in fields where it has not been seen before. SDS cannot be managed this season, but steps can be taken to reduce it in the future.

SDS usually appears first in low and compacted parts of fields, and it tends to spread over time. Symptoms typically appear first in early August. The symptoms on leaves begin as yellow, diffuse spots between veins in the lower to middle parts of the plant (Figure 2). The yellow spots expand between veins and the leaf tissue dies and turns brown. Leaves may be curled and detach from the petioles. Tan discoloration develops in the vascular tissue just under the surface of the lower stem. The pith remains white, which distinguishes SDS from brown stem rot (BSR). SDS also causes root rot, and blue fungal growth can sometimes be seen on root surfaces in moist soil.

We request help this year in determining where SDS has spread and poses a risk to soybean production in Minnesota. We would like samples from any field in Minnesota that has confirmed or possible SDS. If you or anyone you know sees plants that have SDS or are suspected to have SDS, please send them to me free of charge for diagnosis. We have new methods for confirmatory diagnosis. All sample information will be kept confidential. This work is supported by funding from the Minnesota Soybean Research and Promotion Council.

Dean Malvick
U of MN, Dept of Plant Pathology

Confirmed Distribution of SDS in Minnesota
23 counties with confirmed SDS—as of June 2010
D. Malvick, et al., University of Minnesota

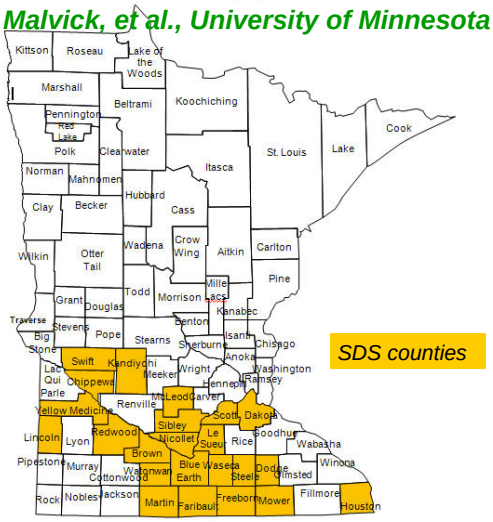


Figure 2. Foliar symptoms of Sudden Death Syndrome (SDS) in soybean. (photo by Dr. Dean Malvick, 2007)

Procedure for collecting and sending samples for SDS survey:

(1) Collect 4 whole plants (include leaves, stems, and roots) that show leaf symptoms that look like SDS or could be SDS from each field.
(2) Let me know that you have samples to send (an email message is preferred: ***dmalvick@umn.edu*** , and we will send a prepaid FedEx label to you for shipping the samples to me. We need the following information: Name, Address, Telephone number, and Email address.
(3) Wrap plant roots in wet paper towels and place in a plastic bag, place whole plant in a paper bag, then place into one box.
(4). Ship the samples to me at this address: Dean Malvick, Department of Plant Pathology, 495 Borlaug Hall, 1991 Upper Buford Circle, University of Minnesota, St. Paul, 55108.
(5) If you have questions, please call me at 612-625-5282 or send an email message to dmalvick@umn.edu.

Your help with this survey would be greatly appreciated. More information, photographs, and a fact sheet on SDS can be found on the Minnesota Crop Diseases web site

http://www.extension.umn.edu/cropdiseases/soybean/suddendeathsyndrome.html

Plan Now for Success with Corn in 2011

Hybrid Maturity:
One of the most important decisions for corn production in northwest Minnesota is hybrid maturity. It is desirable for hybrids to reach maturity (black layer) at least 10 days before the first average fall freeze (32^{0}F), as that allows time for dry-down prior to harvest . This also provides a buffer in case growing degree day (GDD) accumulation is behind normal, or in case planting is delayed. This is not uncommon in the Red River Valley. For example, the first planting date for corn trials near Crookston, MN was May 14 in 2009, compared to April 20 in 2010.

The number of GDDs available for corn production for various planting dates at Crookston and Moorhead, MN are listed in Table 1, along with the latest average corn relative maturity (RM) suited for the available GDDs. While planting a hybrid with a RM slightly later than that suited for a region can sometimes result in a small yield increase, it greatly increases the risk of the crop freezing prior to maturity and it will result in wetter corn in the fall (Figure 1).

Table 1. Average growing degree day (GDD) accumulation (1971 to 2000) until the median date of the first 32^{0}F fall freeze (1948 to 2005) for various planting dates, along with the latest average corn relative maturity (RM) suited for the available GDDs*.

Planting date	GDD to 10 days before first 32^{0}F freeze**		Latest corn RM for available GDD	
	Crookston	Moorhead	Crookston	Moorhead
April 20	2,147	2,262	84	88
April 30	2,103	2,213	83	86
May 10	2,033	2,139	80	84
May 20	1,939	2,039	77	81
May 30	1,821	1,917	73	77

*Adopted from *http://www.extension.umn.edu/distribution/cropsystems/M1276.html*
**Median date of the first 32^{0}F freeze: Sept. 23 at Crookston and Sept. 24 near Moorhead.

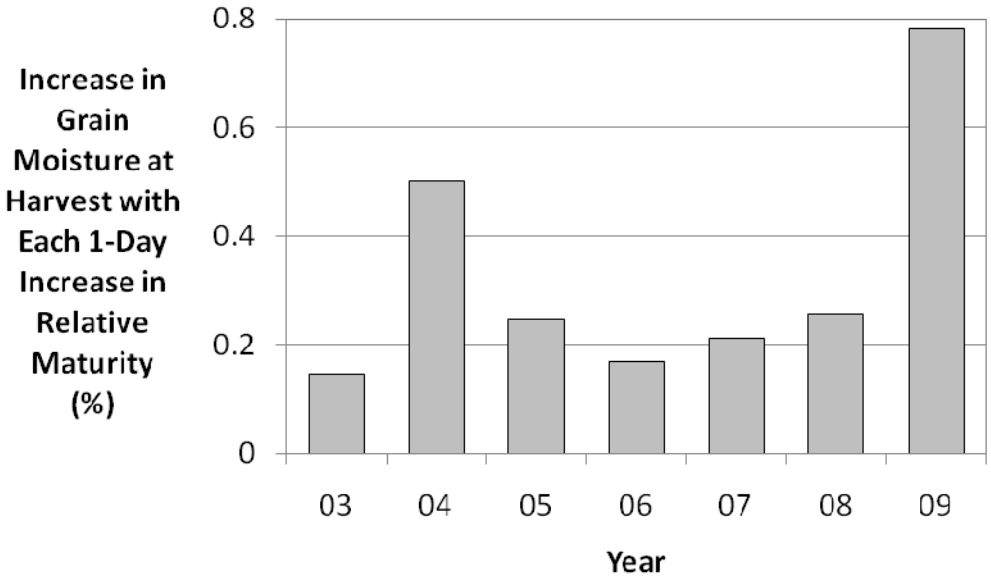


Figure 1. Differences in corn grain moisture at harvest in the University of Minnesota corn hybrid trials at Crookston, MN as affected by hybrid relative maturity and year.

Seeding Rate and Row Spacing:

Another important factor affecting corn yield is final plant population. In 2009 near Crookston, MN, we conducted a trial to evaluate corn response to plant population, and to determine whether the optimum final stand differed between 22- and 30-inch rows. In this study, three hybrids were evaluated, but only the results from the 80-day hybrid are presented (Figure 2), as the later-maturing hybrids froze before reaching maturity.

This study found that a final stand of around 33,000 plants/acre was sufficient for optimizing yield in both 22- and 30-inch rows (Figure 2). This indicates that current corn seeding rate recommendations for southern and central Minnesota (33,000 to 35,000 seeds/acre) based on many site-years of research might also be appropriate for northwest Minnesota. Growers should consider including check strips within their fields that are planted at 10% above and 10% below the normal seeding rate in order to have a benchmark to determine whether their current seeding rates are appropriate.

Surprisingly, this study found no difference in yield between 22- and 30-inch rows when corn plant population was 22,000 plants/acre or higher (Figure 2). This was unexpected, as previous research suggests that the yield advantage for narrow-row corn is greater as one moves farther north within the Corn Belt. We are conducting this trial again in 2010. More information on corn production from the University of Minnesota is available at:

http://www.extension.umn.edu/corn

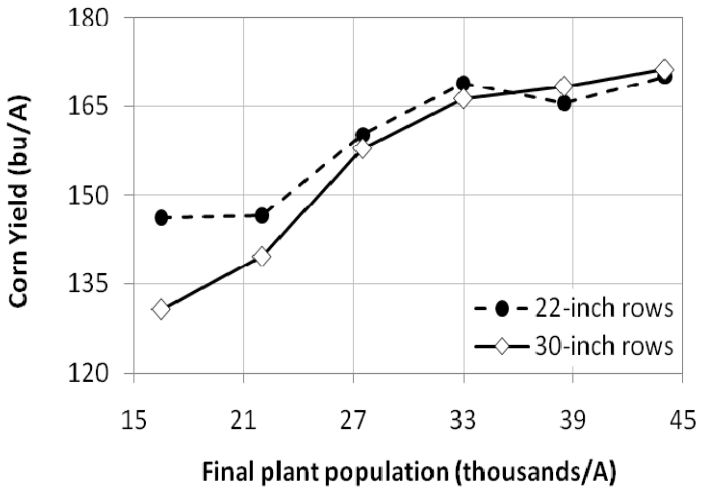


Figure 2. Corn (Pioneer 39V07; 80-day) response to final plant population and row width near Crookston, MN in 2009.

Jeff Coulter, Extension Corn Agronomist
University of Minnesota Extension

Soybean Growth Stages for Pest Management Decisions

Management decisions on whether to treat soybean aphids will be affected by the soybean growth stage in a field during the next two weeks. As plants progress to the later reproductive stages (e.g., R5, R6, R7, etc.) risk of yield loss from aphids declines. Currently, the soybean crop ranges from R3 to R5. Insecticide treatments for R5 stage soybeans may respond positively to soybean aphid treatments when populations exceed threshold, however the level of the yield response has been less predictable. Early R5 treatments are more likely to realize a positive response than late R5 treatments. Treatments for aphids are not recommended beyond the R6 growth stage.

Reference:

R1 Beginning bloom –

One open flower at any node on the main stem.

R2 Full bloom –

Open flower at one of the two uppermost nodes on the main stem with a fully developed flower.

R3 Beginning pod –

Pod 3/16" long at one of the four uppermost nodes on the main stem with a fully developed leaf.

Soybean Aphid Threshold - 250 aphids/plant when population actively increasing.

R4 Full pod –

Pod 3/4" long at one of the four uppermost nodes on the main stem with a fully developed leaf

Soybean Aphid Threshold - 250 aphids/plant when population actively increasing.

R5 Beginning seed –

Seed 1/8" long in a pod at one of the four uppermost nodes on the main stem with a fully developed leaf

Soybean Aphid Threshold - Yield may still be impacted. Continue to use the 250 aphids/plant when population actively increasing. Positive yield response from treating at this stage is less predictable.

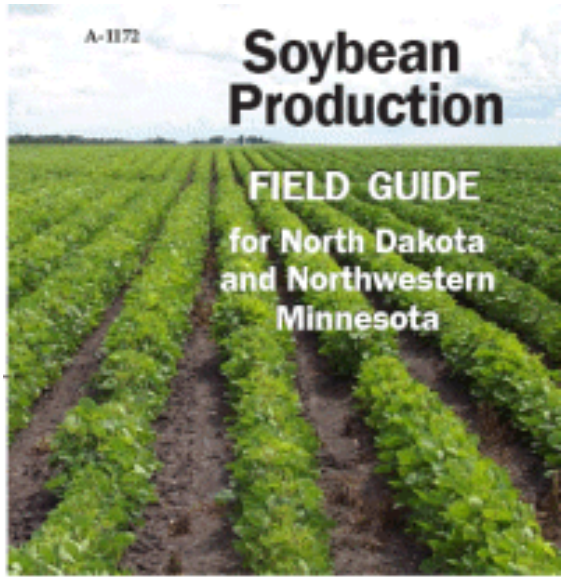
R6 Full seed –

Pod containing a green seed that fills the pod cavity at one of the four upper-most nodes on the main stem with a fully developed leaf.

Soybean Aphid Threshold - Research trials throughout the north central states have not demonstrated a yield benefit to treating soybean for aphid management at the R6 and beyond stages.

W. R. Fehr, C.E. Caviness, D. T. Burmood, and J. S. Pennington. 1971. "Stage of development descriptions for soybeans, *Glycine max* (L.) Merrill." Crop Science 11:929-31

Updated Soybean Production Field Guide



Producers, agricultural consultant and other interested in agriculture can use the updated soybean production (spiral bound) pocket field guide to obtain the latest information about soybean production. The previous field guide was published in 2002 and was in need of major updates especially on soybean cyst nematodes, soybean aphid, diseases, and other management issues. The completely revised and reviewed guide was written by state extension staff working with soybean, and other specialists from both North Dakota State University and the University of Minnesota. The field guide also has a photo section at the back of the booklet with pictures of pests and diseases.

The 2010 Soybean Production Field Guide (A-1172) was partially funded by the North Dakota Soybean Council, Minnesota Soybean Research and Promotion Council and produced by the North Dakota State University Extension Service.

Northwest Minnesota soybean growers should receive a complimentary copy in the mail during the first week of August. If producers do not receive their copy please call the Northern Minnesota Soybean Office at 1-800-242-6118 ext 13.

North Dakota growers can order a complimentary copy of the pocket guide from the North Dakota Soybean Council by phone 1-888-469-6409 or e-mail swolf@ndsoybean.org.

The Soybean Production Field Guide can also be obtained from the NDSU Distribution Center for $2.75 per copy plus applicable shipping and handling. Call (701) 231-7882 or e-mail NDSU.DistributionCenter@ndsu.edu for information or order online at
http://epayment.ndus.nodak.edu/C22800_ustores/web/store_main.jsp?STOREID=3&SINGLESTORE=true

Hans Kandel
NDSU Extension Agronomist Broadleaf Crops,

Green Cloverworm Turning up in Soybean Fields

During aphid scouting forays, we are finding **Green Cloverworm** ranging in size from 1/4" - 3/4" long. Its not a problem in fields, but we have seen these show up in fields during August and do some noticeable chewing on the upper leaves. In past years, the feeding has been well below threshold. Cloverworm (larvae and moths) are being reported in many other soybean production areas to the south of us.

Thresholds for these insects are based on the level of defoliation and stage of the plant. Treat only if defoliation reaches 20% during bloom, 15% during early pod-fill (this can be raised as pod fill progresses), and 30% post pod-fill to harvest. Be sure to check if plants are still filling pods prior to making treatment decisions.

Figure 1. Green cloverworm feeding on soybean.

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Find us on the Internet at:

http://nwroc.umn.edu/Cropping_issues/CroppingIssues.htm

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