

Thank you for your readership of the Crop & Pest Report. This is the final scheduled issue of the Crop and Pest Report for 2011. An ad-hoc issue may be published on September 15th if important crop and pest issues arise to warrant another issue.

Best wishes for a good harvest!



Table of Contents	
Soybean Aphids Decreasing.....	1
Watch for Grasshoppers	2
What are These White Butterflies Flying Around?.....	2
Dealing With Late Maturing Corn .	3
Canola Straight Combining or Swathing	4
Update on Diseases of Sugarbeet .	5
Dry Bean Anthracnose Found	6
Very Little Dry Bean Rust Found ...	7
Consider Soil Testing for Soybean Cyst Nematode	7
Soybean Cyst Survey to Begin.....	8
Recap of Small Grain Diseases	8
End of Season Weed Control Reminders.....	10
The Most Important Weed Control Decision You Make! .	11
Yellowjacket Season is Here.....	12
Around the State.....	13
Weather/Crop Phenology Maps .	15

SOYBEAN APHIDS DECREASING

Most of the fields have decreasing populations of soybean aphids now. Shorter day lengths and the maturity of the soybeans have triggered aphids to develop wings and fly back to its overwintering host, buckthorn, or late-planted soybean fields. Bruce Potter of UMN Extension already found soybean aphids on buckthorn on August 15 in SW Minnesota. The USDA NASS report for North Dakota indicated that most of the soybeans are in the R5 (full pod) growth stage in ND, and after R5 no insecticide treatments for soybean aphids are recommended because of no increases in yield returns. In north central North Dakota, soybeans were planted later and are only in the R3 crop stages. See D. Waldstein’s article on increasing soybean aphids in late planted soybeans in the *Around the State* section.

The Extension Entomology office has been getting several calls and emails on whether to be concerned with soybean aphids populations that are below the economic threshold of 250 aphids per plants, and when these populations continue to exist for several weeks while the soybeans are in R4 (beginning pod) to R5 (full pod) growth stages. The answer is **“not to worry about these sub-economic threshold populations because they need to reach the 650 aphids per plants level to cause yield loss.”**

Below, I have summarized the results of *2009 Insecticide Efficacy Trial for Soybean Aphids* at Prosper, ND where we had low numbers of soybean aphids for several weeks during the growing season when soybeans were R4-R5. Pre-spray aphid counts indicated that aphids were present in all treatments, and were fairly evenly distributed. After applying insecticides at the R4 growth stage, post-spray aphid counts indicated differences among treatments. At 7, 14, and 23 days after treatment (DAT), the untreated check had significantly more aphids/plant than all insecticide treatments, and there were no significant differences among insecticide treatments. **However, there were no significant differences among all treatments for yield.** This is not unexpected, as the economic threshold was never reached and current research in the midwest indicates that aphid populations below the economic threshold do not significantly impact yield.

Table 1. Mean number of soybean aphids/plant at 0, 7, 14 and 23 days after treatment and yield.

Treatment	Mean no. Aphids/Plant 0 DAT	Mean no. Aphids/Plant 7 DAT	Mean no. Aphids/Plant 14 DAT	Mean no. Aphids/Plant 23 DAT	Mean Yield (bu/acre)
1) Untreated check	30.8 a	72.15 a	47.95 a	83.05 a	48.4 a
2) Warrior II at 1.54 fl oz/a	24.2 a	0.75 b	0.2 b	1.05 b	48.4 a
3) Bifenture at 2.1 fl oz/a	23.9 a	0.1 b	0.7 b	0.05 b	49.7 a
4) Bifenture at 4.2 fl oz/a	32.6 a	0 b	0.15 b	0 b	48.9 a
5) Cobalt at 13 fl oz/a	34.5 a	0.05 b	0.65 b	0.75 b	48.8 a
LSD	19.75	26.37	10.46	14.42	4.23

Means within a column with the same letter are not significantly different (Fisher's Protected LSD, $P \leq 0.05$). DAT = days after treatment

WATCH FOR GRASSHOPPERS

This time of year, adult grasshoppers are very mobile and start to fly around after cereal crops and other early season crops are harvested to find green crops. So, it is important to continue to scout for grasshoppers in late-season row crops, such as sunflower, corn, flax, etc. When 20 or more adults per square yard are found in field margins or 8 to 14 adults per square yard are occurring in the crop, treatment would be justified. In some cases, only field edges need to be sprayed to protect fields from grasshopper infestations. Be sure to check preharvest intervals before application. For insecticide recommendations, please consult the *2011 North Dakota Field Crop Insect Management Guide*: <http://www.ag.ndsu.edu/pubs/plantsci/pests/e1143w1.htm>



Two-striped Grasshopper.
Photo courtesy of P. Beauzay, NDSU.

WHAT ARE THESE WHITE BUTTERFLIES FLYING AROUND?

I've received many calls and emails about all of the white butterflies flying around ditches, canola, and other areas and whether they are an insect pest. These butterflies belong to the insect family Pieridae and to the group called Sulphurs and Whites, which are usually white or yellow in color. Most of their caterpillars are green, usually with one or more pale lateral stripes. Their body surface is covered with minute hairs, which gives them a velvety appearance. Larvae of resident species overwinter as chrysalids.

At least 14 species of this group occur in North Dakota. Common examples include the checkered white, cabbage butterfly or imported cabbageworm and alfalfa butterfly. The cabbage butterfly or imported cabbageworm is one of the most common and is attracted to plants in the mustard family (cabbage, broccoli, cauliflower, canola) and can be an occasional garden pest. However, it is typically not an insect pest of canola. Female cabbage butterflies have two black spots on forewings and males only one spot. The alfalfa butterfly is rarely an insect pest of alfalfa in North Dakota. So, enjoy the beautiful butterflies!



Female cabbage butterfly.
Photo courtesy of G. Fauske, NDSU



Male cabbage butterfly.
Photo courtesy of G. Fauske, NDSU

Janet J. Knodel, Ext. Entomologist
janet.knodel@ndsu.edu



DEALING WITH LATE MATURING CORN

As far as temperature is concerned, the 2011 growing season is shaping up to be similar to the long term average, at least for the eastern third of the state. In fact, growing degree day (GDD) accumulations for this region of the state are within 30 GDDs of the long term average. GDDs for the western two-thirds of the state, however, are running 100 to 200 GDDs behind the long term average. GDDs for all of the state are similar to those of last year, which turned out to be a relatively good year for corn. So that is the good news. Because of the extremely wet spring weather, however, most corn was planted late. The fact that more than half of all the corn was planted after May 24th means that much of the corn in the state is lagging significantly behind where it should be. As an example, at Wyndmer, delaying the planting of corn until May 24 "cost" the crop 184 GDDs. Delaying the planting until June 1st "cost" the crop 317 GDDs. Given the lateness of the season, it will be unlikely that late planted corn will be able to catch-up before the first killing frost. Of course making it to physiological maturity (maximum dry wet of the grain) is only part of the challenge. The other is to have the grain dry sufficiently so that it can be economically harvested, dried and stored. The following are a few points to consider with regards to late maturing corn as we approach the end of the growing season and harvest.

- Corn that reaches physiological maturity (PM) has a moisture content of 30-32%. Moisture content prior to PM declines as additional starch is deposited in the developing kernel. Moisture loss after PM is by evaporation. Grain from plants that are killed prior to PM will be shriveled and have low test weight because they lack sufficient starch to fill out the kernel.
- The rate of moisture loss after the death of the plant via evaporation, whether the kernel has reached PM or not, will largely depend on air temperature. Obviously relative humidity can play an important role in evaporation, but air temperature is the most dominant factor in ND. Warm air has the ability to hold more water vapor than cold air, so warmer air temperatures are able to draw more air out of the drying kernel than cooler temperatures. A good rule of thumb is that most field-drying that is going to occur in the fall will occur prior to November 1st. In some of our recent monitoring work, we found average moisture losses of between 0.25% to 0.33% per day during late September and October. Moisture loss after 1 November was much less than these values. Of course if we have a warm November, we can expect drying to continue through November.
- Leaving the corn crop over the winter has been found to be a profitable option when corn is excessively wet and difficult to harvest in the fall. Because of the limited water holding capacity of our air in the winter, the rate of corn drying during the winter is very slow. We observed an average moisture loss rate of about 0.1% per day for the period of December 1st to February 21st in 2009/2010. Grain that had 32% moisture in early December reached 24% moisture on February 21st. In another study starting with relatively dry corn (18%) in 2008/2009 we observed minimal decline in grain moisture until the beginning of March, at which point the rate of decline accelerated until the corn was harvested in early May.
- The test weight of wet corn increases with drying, except for corn with more than 42% moisture where the opposite is true. Field drying during the winter may improve the test weight of corn that is excessively wet over high temperature drying, but don't expect more than a couple of pounds difference. A 45 lb/bu crop will be a low test weight crop regardless of how it is dried. A shriveled kernel will be a shriveled kernel!
- Yield losses can be substantial during the winter due to snow, winds and wild animals. Most yield loss is associated with ear drop and lodging. If the crop goes into the winter with good stalk strength, it is more likely that yield losses will be less than if the crop has poor stalk quality. We have not experienced much drought this year, so perhaps stalk strength will be good as we approach harvest.

Joel Ransom - Extension Agronomist for Cereal Crops
Joel.ransom@ndsu.edu

CANOLA STRAIGHT COMBINING OR SWATHING

Producers traditionally have swathed rather than straight combined canola; however, straight combining is an option for canola. Straight combining can save time and money, and result in improved seed quality. Heavier canola stands are better suited for straight combining than thinner stands because of the decreased likelihood of shattering from wind. Straight combining has resulted in yield losses of 8 to 54%, as reported by the Canola Production Center in Canada. These losses primarily were from preharvest shattering and combine shattering losses. Studies conducted with farmer-size combines at Minot in 2005 and 2006 demonstrated that timely straight combining can achieve similar or better canola yields compared to swathing. Straight-combined canola tended to have lower harvest moisture, darker seed color, lower green seed, and higher test weight. About 15 to 20 % of canola in North Dakota is currently straight combined successfully by the growers.

Presently, Diquat is the only product labeled for use as a preharvest desiccant in canola. Growers can maintain excellent yield and quality if the Diquat application is timed properly and the crop harvested in a timely manner. Diquat should be applied when 60 to 75% of the seeds have started to turn color. Canola seeds mature in the bottom pods first, while the last seeds to mature are in the top pods. Apply the desiccant when seed in the middle pods (or 60 to 75%) have started to turn color. Research has shown that when the desiccant is timed properly, crop quality parameters, including yield, test weight, oil content, seed loss, green count and grade, generally were similar for desiccated canola compared with swathing.

Diquat applied too early may result in lower yield and seed quality, with a trend toward higher green content. Diquat requires a seven-day preharvest interval. Canola harvested 14 days after application will have lower green content than canola harvested seven days after application. Fields with excessively lodged canola may be difficult to desiccate because the spray droplets may not be able to penetrate the canopy. Therefore, swathing may be the better choice for lodged canola.

Swathing canola at the optimum stage of ripening reduces green seed problems and seed shatter losses, and ensures the quality required for top grades and prices. Swathing can begin in canola at 60% color change (<http://www.canolacouncil.org/chapter11.aspx>). When canola plants consist only of stems, stem branches and pods, the crop probably is very near the optimum time for swathing. Seeds in all pods on a plant complete filling (physiological maturity) at about 40% moisture and then slowly turn from green to light yellow or reddish brown, brown or black, depending on the variety. In hot (90 F), dry weather, canola seed can go from 10 to 50% seed color change in just three to five days or less. Once filled, seeds rapidly lose moisture at about 2 to 3 percentage points or more each day, depending on the weather.

Inspect fields every two to three days when some color change occurs in the first-formed pods on the bottom of the main stem. To determine when a field of canola is ready to swath, examine plants from different parts of the field. The stage of maturity in an evenly maturing field will vary from plant to plant and from area to area within the field. When examining the plants, take into account varying soil types, low-lying areas, available soil moisture and exposed early ripening areas.

Examine only pods on the main stem. Seeds in pods on the bottom third of the main stem were formed earlier and will turn color much sooner than seeds in the pods on the top third of the plant. When the overall moisture content of seed from the total plant averages 30 to 35%, about 30 to 40% of the seeds in pods on the main stem will have changed color or have started to change color. Seeds with only small patches of color should be counted as color changed. The color of the seed is more important than the overall color of the field in determining the stage of maturity. Most of the seeds that have changed color will be from the bottom third of the main stem. When seeds in the bottom pods slightly turn color, seeds in the top, last-formed pods are filled or nearly filled.

For more information see: <http://www.ag.ndsu.edu/pubs/plantsci/crops/a1171w.htm>



Hans Kandel - Extension Agronomist Broadleaf Crops hans.kandel@ndsu.edu

Brian Jenks, NDSU Weed Scientist Brian.Jenks@ndsu.edu



UPDATE ON DISEASES OF SUGARBEET

Some of the common diseases that currently affect sugarbeet include *Rhizoctonia* root rot, *Aphanomyces* root, *Fusarium* yellows, and *Cercospora* leaf spot.

Rhizoctonia solani causes *Rhizoctonia* crown and root rot of sugarbeet and root rot is becoming more prevalent, probably because of planting into warmer soils that have remained wet most of the season. *Rhizoctonia solani* can infect sugarbeet at all growth stages and results in wilting and death of plants. The fungus causes infection when soil moisture range from somewhat dry to wet and soil temperatures above 65F. The fungus typically causes damping-off, and crown and root rot of sugarbeet. Damping-off occurs at the seedling stage when the fungus infects the hypocotyls resulting in rapid collapse of seedlings before soil emergence or post-emergence. Damping-off affects the plant population and ultimately reduces the yield. Crown and root rot infection is observed in older plants when the pathogen infects the petioles or the roots. Characteristic symptoms of *Rhizoctonia* include sudden wilting of leaves, and petioles of outer leaves may be blackened at the point of attachment to the crown. Crown and root rots, separately or collectively, are the most damaging phase of the disease and reduces yield significantly.

Fields with a known history of severe *Rhizoctonia* should be planted to a tolerant variety. Crop rotation with a non-host, namely wheat, early planting, proper drainage, and avoidance of throwing soil into crowns of plants at cultivation will assist in managing the disease. The use of Headline or Quadris fungicides at planting provide protection from damping off should the soil become warm (65F) and wet during the seedling stage. The use of the fungicides Quadris or Proline applied in a 7 inch band just before the average soil temperature at the four inch depth reaches 65F will also help to control *Rhizoctonia* crown and root rot.

There are also fields infected with *Aphanomyces* root rot. Warm and wet soils provide favorable conditions for infection by the fungus *Aphanomyces cochlioides*. In fields with a history of this disease, growers should use tolerant varieties treated with Tachigaren.

Fusarium yellows were first observed very early at the Moorhead research site. Symptoms include interveinal yellowing and death of older leaves, sometime distinct death of half the leaf on one side of the midrib, followed by death of the younger leaves. When the roots of infected plants are cut in a cross section, there is a distinct darkening of the vascular system. Roots of infected plants will not store well in piles. The best way to manage *Fusarium* yellows is to plant *Fusarium* tolerant varieties.

Cercospora leaf spot is the most damaging leaf disease of sugarbeet in our area. It is caused by the fungus *Cercospora beticola* which does most damage in warm weather (80 to 90 F during day and over 60 F during night) and when it is rainy or when we have heavy dew. The fungus destroys the leaves that are responsible for making the sugar in the plant resulting in reduced tonnage and lower extractable sucrose.

Growers, over the years, have done a good job of managing *Cercospora* by using crop rotation, tolerant varieties, and fungicide applications. During the past five years, inoculum pressure in growers' fields has been low and continues to be low in most areas. Fields should be scouted and treated with fungicides when the disease thresholds are reached and daily infection values are favorable for the disease. Effective fungicides for controlling *Cercospora* leaf spot in fungicide trials at Foxhome include Proline, Inspire, Headline and a mixture of Topsin and Super Tin.

The best way to control *Cercospora* leaf spot is to apply fungicides in a timely manner. For ground application, apply fungicides in 20 gallons of water per acre at 100 psi pressure; aerial applicators should use 5 to 7 gallons of water per acre for best results. Use the recommended rate of the fungicide; cutting rates will result in poor disease control and will quickly lead to the development of resistant isolates.

Growers need to plan management strategy early to manage diseases – planning should start with field and variety selection. Fields with diseases at this time should be recorded, so that appropriate varieties will be selected the

next time these fields go into sugarbeet. Scout fields when necessary so that fungicides are applied in a timely manner, and when necessary, shorten the fungicide application intervals to prevent *Cercospora* leaf spot from causing an economic loss.

Mohamed Khan - Extension Sugarbeet Specialist, NDSU and University of Minnesota
Mohamed.khan@ndsu.edu

DRY BEAN ANTHRACNOSE FOUND

During a survey of dry beans last week anthracnose was identified in the Wells Co. area. The disease was found in the same general area last year, and its presence is alarming. Anthracnose is a disease that growers can do little to manage once they have it in their fields.

The pathogen survives *in the seed*, so planting see from that field will nearly ensure an epidemic in the future. Additionally, fungicide seed treatments WILL NOT eliminate anthracnose in seeds, because the pathogen is *IN* the seed. Lastly, dry bean seed may be infected without symptoms on the seed itself.

Symptoms of anthracnose can appear anywhere on the plant, but leaf symptoms are most unique and easily identified. On leaves, the disease will show up as necrotic (black) areas *on the veins* of the leaf. On the stem, pods, and seeds the lesions will be sunken necrotic lesions.

It is important to scout your fields for anthracnose, and if found in the field, **PLEASE DO NOT SAVE THE SEED FOR PLANTING**. If in doubt, it is best to use certified seed. The NDSU diagnostic lab can do a quick diagnosis for anthracnose, plant samples can be sent to:

Plant Diagnostic Lab; 206 Waldron Hall
NDSU Dept 7660, PO Box 6050
Fargo, North Dakota 58108-6050
Email: kasia.kinzer@ndsu.edu
Lab Web: <http://www.ag.ndsu.edu/pdl>



VERY LITTLE DRY BEAN RUST FOUND

Dry bean rust was identified in the growing region in the last two weeks. It has been suspected or confirmed in Traill, Grand Forks, and Walsh counties. It is being found on new varieties that have the *Ur-3* gene, so it is the new race (or a variant of it) that was first identified in 2008.

Dry beans are maturing quickly, and it is becoming unlikely that a fungicide application would be beneficial if rust is found in your field. Once pintos are striping fungicides are NOT recommended. Preventative applications are NOT recommended.

There is surprisingly little rust being found. Fungicides were used heavily for white mold this year, and even though they may not be the best rust products (there are exceptions) they will knock down rust and likely served as a good preventative application. The use of those products likely delayed the onset of rust this year, and may have reduced the potential severity region-wide.



CONSIDER SOIL TESTING FOR SOYBEAN CYST NEMATODE

SCN is a parasitic worm that can cause 15-30% yield loss without above ground symptoms. The disease can be a 'silent killer'. It is the #1 soybean disease in the U.S., and is spreading though North Dakota. It was first confirmed in Richland County (2003), followed by Cass (2007), Dickey (2009), LaMoure (2010), Ransom (2010), and Barnes (2010). SCN may take a few years (seasons of soybeans) to build up, but when it does, it is difficult to manage. As such, early detection of SCN is very important.

Soil testing is the best way to determine if you have SCN in your fields. Briefly, take a small soil probe, probe about 2 inches from the soybean plants, down 6-8". Take maybe 20 cores, mix, bag, and send to that lab. In North Dakota, I would recommend sampling places that SCN is most likely to be found; namely, the field entrance, low spots, and near fences or tree rows.

I am including some links to youtube videos about SCN and soil sampling from states that have had the problem for some time, Iowa and Nebraska. These video will help you understand what SCN is, and the Iowa State video shows exactly how to soil sample. I am also including a link to a website with great SCN info, sponsored by the North Central Soybean Research Program, which is partially funded by the North Dakota Soybean Council

http://www.planthealth.info/scn_basics.htm.

Local labs that process SCN soil samples.

AgVise
902 13th Street North; P.O. Box 187
Benson, MN 56215
320-843-4109
Fax 320-843-2074
<http://www.agviselabs.com/>

Nematology Laboratory
University of Minnesota
Southern Experiment Station
35838 120th St.
Waseca, MN 56093-4521
Tel: 507-835-3620
<http://sroc.coafes.umn.edu/Nematology/staff.htm>

NDSU Plant Diagnostic lab
306 Walster Hall
Fargo, ND 58102
701-231-7854
www.ag.ndsu.edu/pdl

Video links

How to soil sample for SCN in the fall (9:19) – Greg Tylka – Iowa State University (very good & detailed)

<http://www.youtube.com/watch?v=W2GCGnOcGWs>

Soybean Cyst Nematode Basics (3:47) – Loren Giesler – University of Nebraska (Covers the basics very well).

<http://www.youtube.com/watch?v=GLHTCSYkc5I&NR=1>

SOYBEAN CYST SURVEY TO BEGIN

In an effort to determine how widespread SCN is in North Dakota, NDSU plant pathology is collaborating with the National Agriculture Statistics Service (NASS) and the North Dakota Soybean Council (NDSC) to conduct a survey beginning next week. This is the second year of this survey. NASS enumerators will soil sample for SCN in approximately 120 soybean fields throughout the state. The soil will be processed at the plant diagnostic lab at NDSU, and the data will be presented at winter meetings. Only county wide data will be presented. The 2010 survey, and the associated sample submission received (and permission granted) was the reason that Barnes, LaMoure, and Ransom counties are known to have SCN. Thank you for your help.

Sam Markell - Extension Plant Pathologist
samuel.markell@ndsu.edu

RECAP OF SMALL GRAIN DISEASES 2011

As stated earlier this summer, late plantings, heavy rains, continuously wet crop canopies and soils, high temperatures, and high winds are not a formula for excellent small grain crops. These conditions in many areas of ND took a toll on yield and quality, and also contributed to diseases problems. This was a year to remember and a year to put behind us. What did we see in small grains this year as the season progressed?

Wheat streak mosaic virus (WSMV): This virus disease, vectored by the wheat curl mite, appeared early in the season, and frequent confirmations were made by the NDSU Plant Diagnostic Lab on samples submitted, primarily in winter wheat, but also in spring wheat. The source of the virus and mite frequently was volunteer wheat that had not been completely controlled prior to planting of the new crop. Management of WSMV is entirely dependent on the breaking of the green bridge for virus and mite survival. Grass hosts, such as volunteers and grassy weeds, must be destroyed at least two weeks prior to planting, and appropriate planting dates must be used (mid to late Sept. for winter wheat, early spring for spring wheat).

Tan spot and Septoria species: *Tan spot:* This fungal leaf spot developed early in the wheat crop because of all the spring moisture, and continued to develop in the canopy all growing season. Early season application of fungicide alone probably wasn't enough to prevent the heavy infections seen later in the season in some crops. Infections of the fungi in the *Septoria species complex* were observed most readily once crops entered the heading stage, and also were common. *Net blotch or the spot form of net blotch* was the most common fungal disease observed in barley. Fungicide treatments helped control all these fungal leaf spot diseases, but other, non-fungal, problems may have overtaken fungicide response.

Barley yellow dwarf virus (BYDV): This virus infection became apparent early in the season, with the fairly early appearance and common occurrence of the small grain aphid vectors. Some commercial fields had fairly severe and widespread BYDV infection, and these infections would lower yield and test weight of the crops. Insecticides could be used to control the grain aphid before virus transmission, but no pesticide can control the virus per se.

Bacterial leaf streak and black chaff: Bacterial infections were severe and widespread this year in wheat and lesser so in barley. The frequent rains and storms really favored leaf wounding and spread of the causal bacteria. The head infection caused by the bacterium, called black chaff, was very apparent in some fields, as well. Bacterial infections are not controlled or managed by any fungicide treatments commonly used on small grains. Yield losses due to bacterial infection will be variable depending on extent of infection and damage seen, and kernels may be shriveled, as well.

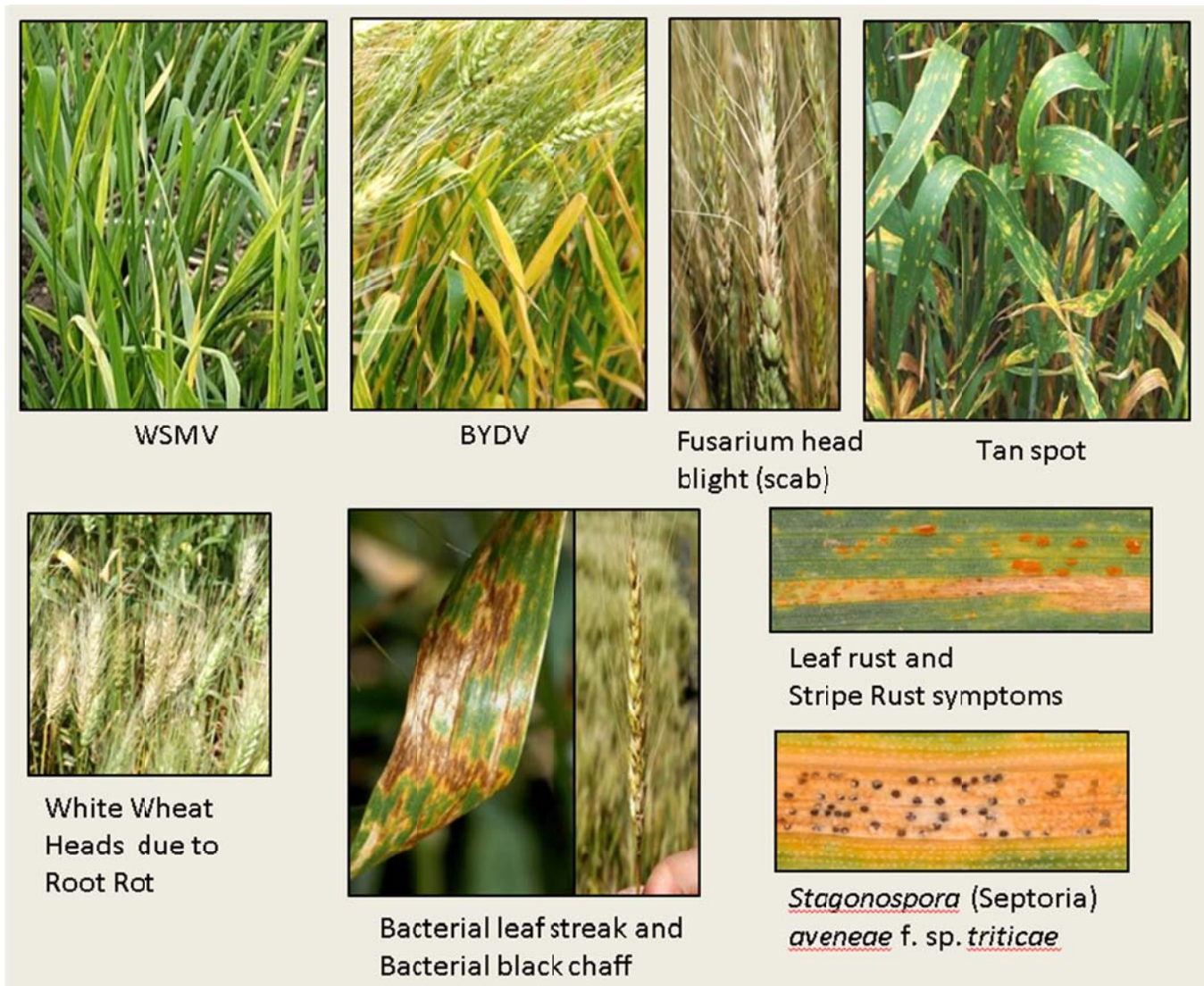
Root rot: Although less commonly observed than expected because of water-logged soils, root rot symptoms were visible in some fields, where patches of grain heads turned prematurely white and contained no grain. The affected plants easily pulled from the soil. Some seed treatment fungicides alleviate early infections from root rot pathogens, but in 2011, the soil conditions may have been overwhelming favorable for continued infection in some fields.

Fusarium head blight (FHB): FHB or scab was more common in 2011 than in the past five years. The full extent of this disease is not known yet, as very few yield and DON (vomitoxin) reports are in, but the disease symptoms were noticeable in many fields, and some harvested grain is now showing the scabby kernels or tombstones. In years very favorable for FHB, fungicides provide, on average a 50-60% reduction in FHB disease severity, and a 40-50% reduction in DON. Greater disease reductions have been seen in years when conditions were less favorable for infection. This year, fungicide use might seem disappointing; however, because of the prolonged favorable conditions for FHB infection, and because some severe problems, ie. barley yellow dwarf, root rot, and bacterial streak, were not affected by any foliar fungicide use.

Leaf rust and stripe rust: The one area of good news for ND producers in 2011. Rust infections were very infrequently observed in winter and spring wheat crops and in barley in 2011, and only at trace levels were observed in commercial fields. Rust infections did not develop in states to our south, so few spores moved into our area. The heavy stripe rust infections in Montana did not appear to be carried into ND, except perhaps along the very western border counties.

Overall, the diseases were just too plentiful in 2011 for many producers, and many were not manageable once observed. Once data comes in from research plots, more information should be available on variety performance and fungicide performance in this strange year.

Marcia McMullen - Extension Plant Pathologist, Cereal Crops
Marcia.mcmullen@ndsu.edu





END OF SEASON WEED CONTROL REMINDERS

Scouting.

Scouting fields for weeds throughout the growing season is extremely important to maintaining herbicide effectiveness and planning for future weed control decisions. Scout fields now and at harvest to determine the effectiveness of this season's weed control practices. If weeds are present now, determine why they are present. If weeds are present due to herbicide resistance, then weed control and cropping practices must be different next season and beyond. Determining if resistance is present in a field can be difficult at times, especially with low-level resistance such as resistance to glyphosate and ACCase-inhibiting herbicides. If a single weed species is left behind after a herbicide application and all other susceptible species are controlled, then herbicide-resistant biotypes may be present. If low-level herbicide resistance is present in a field then normal-appearing plants will be next to dead plants and a continuum of responses between normal and dead will likely be present. For additional assistance in determining if low-level or glyphosate-resistant biotypes are present in a field, view a video entitled "Scouting for Glyphosate Resistance". The video can be found at the following web site and will be most helpful if the last herbicide application occurred within the last six weeks: <http://www.ag.ndsu.edu/glyphosateresistance>.

In addition to scouting for resistant plants, determine the presence of perennial weed patches to begin planning future management strategies. Pay close attention to the presence of dandelions. One effective tool to managing perennial weeds is to apply glyphosate as a pre-harvest application. Consult the North Dakota Weed Control Guide (<http://www.ag.ndsu.edu/weeds/weed-control-guides/nd-weed-control-guide-1>) for specific recommendations for timing and rates. Fall herbicide applications are an excellent strategy for controlling winter annual, biennial, and perennial (if frost has occurred only those perennial species surviving the frost will be controlled) weeds.

Currently Available Weed Control Strategies.

If weeds are present in a field at this time of the season, few options are available. For Roundup Ready sugarbeet growers, glyphosate can be applied at 0.75 pounds acid equivalent/acre (lb ae/A) up to 30 days prior to harvest as long as the maximum seasonal use-rate has not been exceeded. Another option for sugarbeet growers having large numbers of weeds in a field is to mow the weeds off to just above the sugarbeet canopy. This strategy will only be effective for weeds above the canopy and will be most effective when the first seeds begin to develop. There are no herbicide options available at this time of the season for all other crops, besides pre-harvest applications. The best way to remove weeds at this time of the season is to remove them by hand. Most weeds are producing viable seeds at this time of the season therefore removal of the pulled plants from the field is necessary to prevent distribution of the seeds to the seedbank. Hand-removal or roguing of resistant biotypes is important to maintaining herbicide effectiveness.

Harvest Management.

For sugarbeet growers, if weeds are present in a field, plan to harvest those fields as soon as possible. The process of topping sugarbeet usually destroys the majority of plants. The sooner plant destruction occurs the fewer viable weed seeds are produced. Thoroughly clean the topper after use in a field having weeds to ensure weed seeds are not being spread to another field. For corn and soybean producers, harvest the weediest fields last, to save time cleaning out the combine. Combines will easily move weed seeds from one field to another. Always clean out a combine when moving from a field having weeds to a field not having weeds. If cleaning harvesting equipment is too time-consuming the only other option is to record the harvesting sequence of fields and which fields had weeds present. Then next season increase the weed management strategies for those fields harvested immediately after a field having weeds and those fields having the weeds.

Waterhemp Mathematics.

If a single waterhemp plant in a one acre area survives a herbicide application and produces 100,000 seeds (this is a conservative number since a single waterhemp plant can produce over one million seeds), what may happen in the future? If just 25% of those seeds emerge next season and if only 10% of those plants are resistant, then 2,500 waterhemp plants per will be present at the end of the next growing season in that one acre area. If soybeans were planted in that one acre and 180,000 soybean plants are present at harvest, then only 1.4% of all plants at harvest will be waterhemp. If those 2,500 plants each produce 100,000 seeds and 25% of those seeds emerge the following season and only 10% of those plants are resistant, how many waterhemp plants will be remaining just two years later? There will be 6,250,000 waterhemp plants at harvest in that one acre! This helps to explain why people have said there were no weeds or few weeds present last year, but now there is a problem. This is why it is so critical to obtain 99 to 100% weed control after a herbicide application.

Jeff Stachler
NDSU and U of MN Extension Agronomist – Sugarbeet Weed Science
Jeff.stachler@ndsu.edu

THE MOST IMPORTANT WEED CONTROL DECISION YOU MAKE!

I anticipate the title made many of you curious what the answer is – FALL WEED CONTROL! Beginning in May 90% of my phone calls were about dandelion. Spring pre-plant applications can reduce dandelion infestations and effective in-crop herbicides can be used in corn and cereal crops. In soybean, dry bean, and other broadleaf crops (including RR) the choices and degree of control are much less. This weed will not go away for several years and until conscious and sustained control strategies are used it will keep getting worse. This is just a friendly reminder that Weed Control Rule #7 is always true.

Weed Control Rule #7 = Fields that receive a fall herbicide application will always be cleaner than those fields that don't. In other words, dandelion infestations will be much less in fields that receive a fall herbicide application than those that don't.

Glyphosate at 1 qt/A (generic) or 22 fl oz/A (Monsanto brands) plus 2,4-D at 1 pt/A with or without Express at 1/3 oz/A (75DF) or 0.5 oz/A (50SG) will control many annual, biennial, and perennial weeds.

The following is an article addressing general fall weed control that was written by Dr. Jeff Stachler and published in the last issue of the 2010 Crop and Pest Report:

Now is the time to begin applying herbicides for the control of winter annual weeds, simple perennials such as curly dock and dandelion, biennials such as biennial wormwood, and in some cases cool-season perennial weed species. This is especially true for no-tillage fields, but also for those fields receiving tillage other than moldboard plowing. For fields in which tillage is planned, apply herbicides at least 5 days prior to tillage. Herbicides may be applied within a few days of crop harvest or until the soil is frozen. Based upon research across the Midwest, the most consistently effective control of dandelions is obtained with fall herbicide applications. The best way to drastically reduce or stop seed production of winter annual species is with fall herbicide applications or effective fall tillage. It is always better to apply herbicides in the fall under less than ideal conditions, than to wait until spring to achieve marginal control of these types of weed species, especially dandelion.

The most effective fall herbicide treatment with the most cropping flexibility next spring is an application of glyphosate at 0.75 lb ae/A (22 fl oz/A of a 4.5 lb ae/gal or 1 qt/A of a 3 lb ae/gal formulation + 2,4-D ester at 1 pt/A (4 lb ae/gal). The addition of 2,4-D is most important for dandelion control and will antagonize glyphosate's activity on Canada thistle and perennial grass species. Another herbicide option, would be the addition of Valor at 2 to 3 oz/A to the glyphosate plus 2,4-D mixture. Fall applications including Valor will be most beneficial west of the Red River Valley, because spring rains are not consistent enough to properly activate Valor. Activation of Valor is almost certain with fall applications in the drier areas of the state due to more consistent rainfall throughout the state in fall. Preliminary studies with fall-applied Valor have shown potential to control or suppress weeds such as kochia, seedling dandelion, canola, and chamomile. However, NDSU and

Valent are conducting additional research to determine proper timing of application of Valor and efficacy on spring-emerging weeds. Valor should only be applied in no-tillage fields and any substantial soil movement next spring during planting will reduce the effectiveness of Valor on spring emerging weed species. Read the Valor label and follow the crop rotation guidelines when applying Valor in the fall. Only certain crops can be planted in the spring following fall-applied Valor.

Rich Zollinger - NDSU Extension Weed Specialist
r.zollinger@ndsu.edu



YELLOWJACKET SEASON IS HERE

The Extension Entomology office has started getting calls on annoying hornets swarming, or hornet nests in homes or in trees nearby houses. Hornets (or yellowjackets) belong to the family Vespidae. All yellowjackets sting and their stinging behavior is considered a defensive reaction when the colony is threatened. They can sting more than once because their stinger stays with the insect. Yellowjackets are more aggressive during August into September and more likely to sting people. Although yellowjackets are actually a beneficial insect feeding on other insects, they often become a pest problem when nests are located near homes, schools, picnic areas, or playgrounds. Pest control is often warranted.

Biology: These wasps are social insects and build nests of paper-like material. Nests generally resemble a teardrop-shaped soccer ball and often are seen hanging in trees. Sometimes nests are located underground in mammal burrows, cavities or in between house siding. In the northern temperate climates, only the mated queen wasp overwinters from the previous year's colony. Queens are inactive during the winter, hiding in protected places like under tree barks or attics. In early spring, the overwintering queen builds a new nest and lays an egg in each cell. Larvae hatch from the eggs and are dependent on the queen for food. The queen forages outside the nest and brings food (caterpillars and other insects) back to the larvae until pupation. Sterile female workers emerge from pupae and take over nest building and brood rearing, while the queen stays in the nest. During late summer into early fall, adult males and newly produced queens leave their parent colony. The colony dies off, and only newly mated queens will find a protected place to overwinter.

Control: Vespid wasps are active outside the nest during the daylight hours. Nearly the entire colony is in the nest during the evening and night-time hours, so control measures should be applied to the nest then. There are many insecticides labeled for control of hornets and yellowjackets. The difficulty is making the treatment without being stung. Usually an aerosol spray of one of the many fast-acting wasp killer will quickly kill all workers present in nest. Examples are permethrin, synergized pyrethrins or pyrethroid insecticides. A slower-acting insecticidal approach is to apply carbaryl (Sevin) dust directly onto the exposed nest and entrance hole. After treatment, check the nest for any activity the following day and re-treat if necessary. Nests should be removed to avoid attracting dermestid beetles at some later time and to keep wasp pupae from possibly reestablishing the nest. If dealing with yellowjacket nests in structures like homes, the nest entrance should never be plugged from the outside. If constrained yellowjacket workers cannot escape to the outside, they may locate a way to escape toward the inside of the home or structure, creating a possible stinging threat for people inside. Yellowjacket nests become an important source of carpet and other dermestid beetle infestations in the home, so the nest should be removed whenever possible. When outside enjoying your picnic, avoid wearing bright colors and perfumes which are attractive to hornets and yellowjackets.



Prairie yellowjacket. Photo courtesy of W. Cranshaw, CSU, Bugwood.org

Janet J. Knodel, Extension Entomologist
janet.knodel@ndsu.edu



around the state

SOUTHWEST ND

Rainfall in southwest North Dakota has been highly variable the past two weeks. NDAWN indicated sites at Beach, Dickinson, Dunn Center, and Watford City all received less than a half inch of rain with Beach receiving the least in the region at 0.05 inches. Bowman, Mandan, and Mott sites are all over an inch of precipitation with Mandan reporting 1.76 inches and Mott 1.57 inches for the two week period.

Winter wheat and canola harvest is nearly complete with some spring wheat fields beginning to be harvested. Barley harvest is about half done. Second cutting of alfalfa hay is well underway. With spring wheat seeding occurring well into June we have received questions as to when this wheat will mature and be ready for harvest. I can understand why the questions as the previous week, I saw some spring wheat fields that were just beginning to head. A wet spring caused many producers to delay seeding beyond the normal planting window for spring wheat. Growers will need to keep in mind the following. Standard maturity varieties require about 2400 growing degree days (GDD) from emergence to kernel hard stage (maturity) while early maturity varieties require about 2250 GDD. Both early and standard maturity varieties in the watery ripe stage need 755 GDD to reach kernel hard stage. As summer wanes the accumulation rate of GDD slows as temperatures fall. At Beach during the last half of August in a “normal” year GDDs accumulate at the rate of 30 to 35 GDDs per day. From September 1 – 15 GDDs accumulated at the rate of 25 to 30 GDDs per day and the last half of September they accumulate at the rate of 20 to 25 GDD's per day.

So the question is when will wheat in the watery ripe stage mature? The grower can take the days for the particular stage of development, in this case 755 GDDs needed for maturity and divide this number by the expected rate of accumulation for GDD, let us say 30. The crop will need about 25 days. If today is August 19 then by September 13 under normal temperature conditions the crop should mature. The crop will require additional time in the field for grain to dry prior to harvest and storage. The time required to dry down is highly dependent upon humidity and temperature conditions at this point.



July 22 planted cover crop demonstration on Ernie Holzemer Farm as it appeared on August 18. Several brassica species are planted left of center in the photo with a mix of turnip, sunflower, millet, and soybean on the right.

Stage of Development	GDD to Kernel Hard
Milk	
Kernel watery ripe	755
Early milk	565
Medium milk	
Late milk	
Dough	
Early dough	400
Soft dough	360
Hard dough	155
Ripening	
Kernel hard (difficult to divide by thumbnail: physiological maturity)	80
Kernel hard (can no longer be dented by thumbnail)	-

Additional information on growth staging can be found in “Use of Growing-Degree Days to Determine Spring Wheat Growth Stages,” EB37 by Baur, Fanning, Enz, and Eberlein.

This has been a year in southwest North Dakota where cover crops have been useful “tool” in soaking up the excess water. A tour that maybe of interest to producers and others interested in agriculture is the Cover Crops, Coffee & Carmel Rolls tour Wednesday, August 31 at 8 am on the Ernie Holzemer Farm in Amidon. This is a great opportunity to see a variety of cover crop options grown on clay soils and fine sands before heading out into the field for harvest. You can also follow the progress of this cover crop demonstration seeded July 22 on the SW ND Agronomy Notes website <http://www.ag.ndsu.edu/swagronomynotes>.

Roger Ashley - Area Extension Specialist/Cropping Systems
roger.ashley@ndsu.edu

North Central ND

Wheat Streak Mosaic Threat for Early Planted Winter Wheat:

We expect winter wheat planting to be much greater this season especially if the drier weather continues. We are optimistic since, for the first time in many months, the NOAA forecast for the month of September is for average temperatures and average precipitation. Our concern with wheat streak mosaic virus is that producers will try to plant in late August which will put them at a much higher risk for wheat streak mosaic virus outbreaks. The table below reviews risk factors for wheat streak mosaic virus. For more information on wsmv please see: <http://www.ag.ndsu.edu/pubs/plantsci/smgrains/pp646.pdf>.

High Risk	Reduced Risk
Plant immediately after herbicide application	Kill wheat volunteers and weed hosts with herbicides or tillage 2 weeks before planting
Winter Wheat Planting Date: End of August	Winter Wheat Planting Date: End of September
Spring Wheat Planting Date: Late May-June	Spring Wheat Planting Date: April
Crop Rotation: Back to back small grains/corn	Crop Rotation: Rotation to broadleaf crops
Planting winter wheat next to late maturing spring wheat or corn	Avoid planting winter wheat next to late maturing spring wheat or corn

Soybean Aphids on the Rise:

Soybeans are in the beginning pod (R3) to beginning seed (R5) stage. Soybean aphids are prevalent in the area and have been found in all scouted fields. There was an average of 193 aphids per plant with about half the fields over the economic threshold of 250 aphids/plant. When 250 aphids per plant are found on a total of 20 soybean plants (4 areas of the field, 5 plants per area), an insecticide application is recommended. Early pod (R3) is a good insecticide timing for aphid control with a range of early bloom (R1) to beginning seed (R5). Once soybeans are in the full seed stage (R6) it is generally not economical to spray for aphids.

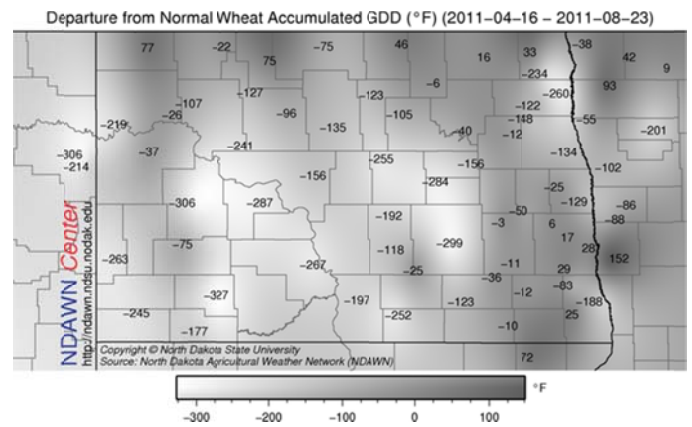
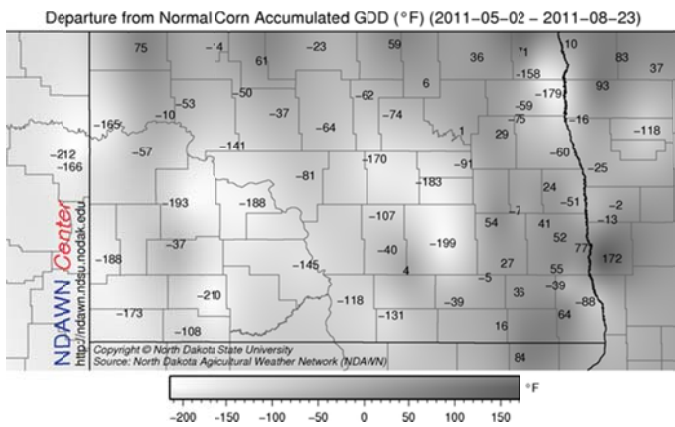
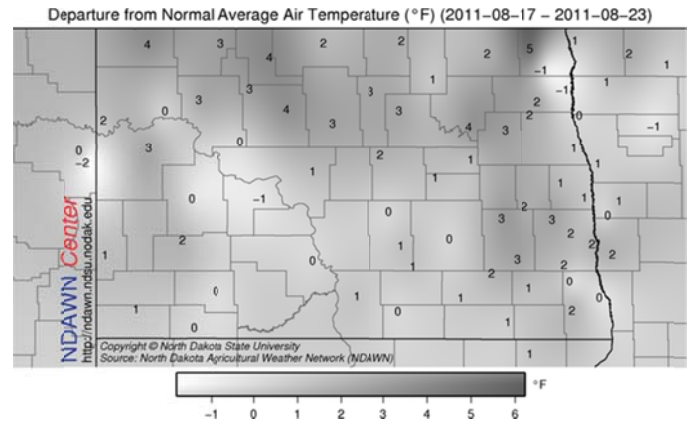
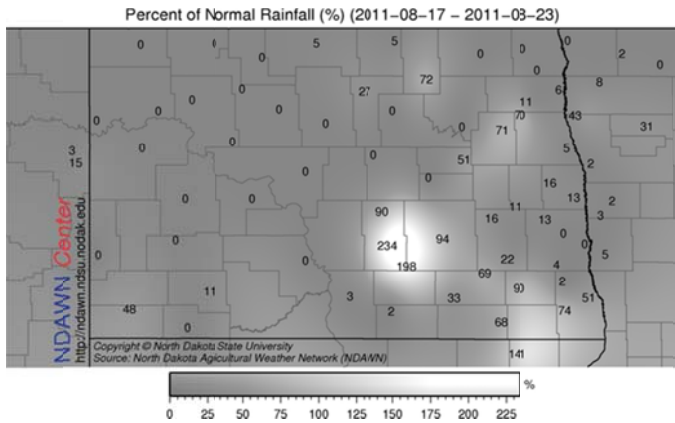
Banded Sunflower Moths a Problem in some Fields:

Sunflowers in the area are in the R4 to R6 stage. We have observed large numbers of banded sunflower moth larvae (more than 20/head) in some fields in the area. Most fields are too late to get good control of this pest with an insecticide application. Early flowering (R5.1) is the best timing for managing banded sunflower moth and several other key insect pests of sunflower. It is generally not possible to control all insect pests in sunflower with one insecticide application.

Trap catches:

Dates	Insect	No. of Moths	Location
8/11-8-17	Banded Sunflower Moth	103	Minot-NCREC
8-17 to 8-24	Banded Sunflower Moth	28	Minot-NCREC
8/11-8-17	Sunflower Moth	0	Minot-NCREC
8-17 to 8-24	Sunflower Moth	0	Minot-NCREC
8/11-8-17	Arthur's Sunflower Moth	53	Minot-NCREC
8-17 to 8-24	Arthur's Sunflower Moth	6	Minot-NCREC

Daniel Waldstein - Crop Protection Specialist
North Central Research Ext. Center, Minot
daniel.waldstein@ndsu.edu



F. Adnan Akyuz, Ph.D.
Assistant Professor of Climatology
North Dakota State Climatologist
<http://www.ndsu.edu/ndsco/>

North Dakota State University
CROP & PEST REPORT
NDSU Dept. 7650; PO Box 6050
Fargo, ND 58108-6050

Janet Knodel, Co-Editor

Entomology
231-7582

Plant Sciences
231-7972

Soils
231-8881

NDSU
Extension Service
North Dakota State University

Sam Markell, Co-Editor

Plant Pathology
231-8866

Weeds
231-7972

Ag Engineering
231-7261

Helping You Put Knowledge To Work

The information given herein is for educational purposes only. References to a commercial product or trade name is made with the understanding that no discrimination is intended and no endorsement by the North Dakota Extension Service is implied.

NDSU Extension Service, North Dakota State University of Agriculture and Applied Science, and the U.S. Department of Agriculture cooperating. Duane Hauck, Director, Fargo, North Dakota. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. We offer our programs and facilities to all persons regardless of race, color, national origin, sex, handicap, age, Vietnam era veterans status, or sexual orientation; and are an equal opportunity employer.

This publication will be made available in alternative formats for people with disabilities upon request (701) 231-7881.