



# entomology

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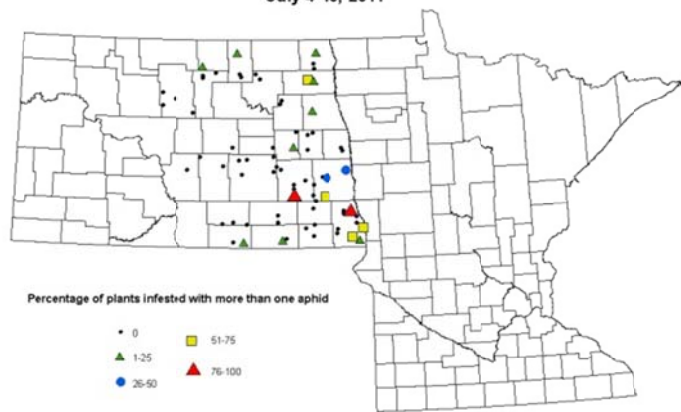
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**HOT TEMPERATURES WILL IMPACT SOYBEAN APHIDS AND INSECTICIDE CONTROL**

Soybean aphid populations continue to slowly increase in major soybean producing counties in southeast ND. See NDSU IPM maps below. So, please be vigilant scouting through R5 (early seed).

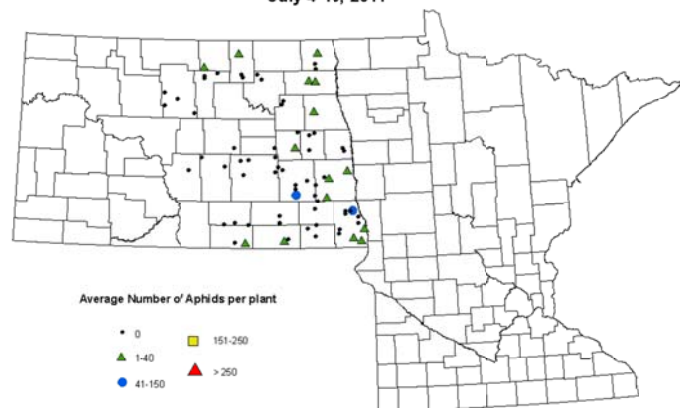
**Soybean Aphids**

July 4-15, 2011



**Soybean Aphids**

July 4-15, 2011



Temperatures have been hot in the high 90s F with a heat index over 105 F this past weekend and into this week. Hot temperatures affect the longevity (or life expectancy) and reproduction of soybean aphids. Laboratory research at constant temperatures indicates soybean aphids are temperate insects that do better at moderate temperatures in low 80s F. As temperature increases, longevity and reproduction decline. The cooler the temperature, the longer aphids survive, and reproduction is also better. At a constant temperature of 90s F in the laboratory, soybean aphid's longevity dropped dramatically and reproduction was almost nil.

However, in the field temperatures fluctuate more with nightly lows about 20 degrees less than the high temperature for the day. Transitory high temperatures have little effect on soybean aphid development as long as nightly lows drop below into the 70s F. Brief periods of hot temperatures don't affect the rate at which females produce nymphs, only the survival of the nymphs. Nymphs born during the heat of the day don't survive well when temperatures exceed the 90s F. As a result, hot temperatures will slow aphid population growth, but will not stop or control aphid populations.

Development of the soybean canopy also moderates the survival conditions for aphids. As the canopy closes, the highest temperatures occur near the top of the canopy. So, soybean aphids may move to the lower mid-canopy leaves to avoid the hot temperatures near the top of the plant. Proper insecticide pressure (40 psi) and coverage (20 gpa by ground, 3-5 gpa by air) is important to ensure canopy penetration and control of aphids that are moving away from upper canopy.

Higher temperatures and low humidity can affect insecticide performance in several ways.

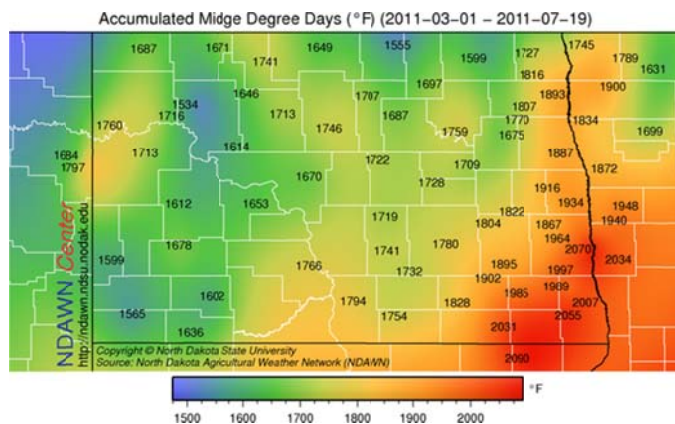
1. The metabolic activity of insects increases as temperature increases. Enhanced metabolism may either enhance the toxic effects of the insecticide or increase insect ability to detoxify or tolerate insecticides. The toxicity of organophosphate insecticides, such as chlorpyrifos (Lorsban), dimethoate, or methyl parathion (PennCap-M), increases as temperature increases. In contrast, the toxicity of pyrethroid insecticides, such as Asana XL (esfenvalerate), Baythroid XL (beta-cyfluthrin), Delta Gold (deltamethrin), Mustang Max (zeta-cypermethrin), Ambush or Arctic (permethrin), or Warrior II (lambda-cyhalothrin), decreases as temperature increases.
2. High temperatures and low humidity may cause small insecticide droplets to evaporate before reaching and penetrating the canopy. Evaporation may reduce insecticide control. Evaporative effects can be reduced by avoiding application during the heat of the day, increasing water volume, increasing droplet size by changing nozzles, or by adding crop oils or non-ionic surfactants (consult labels or companies for specific recommendations).

(Source: Ken Ostlie, UMN, Minnesota Crop News)

## WHEAT MIDGE UPDATE

At 1,800 degree days (DD), populations of adult wheat midge will begin to decline to the point where field activity is below economic threshold levels. In the northern counties, DD accumulations are near or above 1600 DD (see NDAWN map on right). So, continue scouting wheat/durum fields until 1800 DD is reached. Late planted wheat fields (after June 1) may still be in the susceptible stage, heading, for wheat midge infestation in northern counties.

There have been several questions about which insecticide to use for wheat midge control if wheat/durum fields need to be treated. Insecticide testing from Bob Stougaard at Montana State University found that all tested insecticides reduced midge populations and kernel damage relative to the non-treated check, while simultaneously improving yields (see Table below). The non-treated check had an average infestation of 78 larvae per head. At the same time, the non-treated check exhibited 52% kernel damage and yielded only 36 bu/A. In contrast, insecticide treated plots yielded an average of 54 bu/A. However, differences in efficacy did exist among the insecticides evaluated.



Stougaard also found that organophosphate (OP) insecticides, such as Lorsban 4E (chlorpyrifos) resulted in better midge control and kernel damage compared to pyrethroid insecticides, such as, Warrior (lambda-cyhalothrin). However, yields were not different among the insecticide treatments evaluated. Similarly, no differences occurred with respect to grain quality parameters and all insecticides demonstrated excellent crop tolerance (no phytotoxicity).

Insecticide Class	Treatment	Rate	# Larvae per head	% Kernels Damaged	Yield (bu/ac)	Test Weight (lb/bu)	% Protein
OP	Lorsban 4E	1 pt/ac	10.2	6.1	54.5	54.5	16.4
OP + pyrethroid	Chlorpyrifos + Gamma-cyhalothrin	0.26 lb a/ac	15.2	12.3	56.5	54.1	16.7
OP	Chlorpyrifos 3.33 CS	1 pt/ac	19.4	11.8	52.3	53.8	16.7
OP	Chlorpyrifos 3.75 EW	1 pt/ac	12.9	11.2	52.6	52.4	17.5
Pyrethroid	Warrior 1 EC	3.2 fl oz/ac	23.9	22.7	56.3	53.4	17.3
	Untreated check		78.4	51.9	35.8	51.6	18.5
	<i>LSD (P=0.05)</i>		<i>11.43</i>	<i>6.92</i>	<i>13.77</i>	<i>3.14</i>	<i>1.44</i>

Source: Montana State University, Bob Stougaard.

### ARMYWORMS IN WHEAT

High numbers of armyworms were observed defoliating >50% of the flag leaf in wheat near Argusville in Cass County. Armyworm outbreaks in North Dakota can occur when large migrations of moths from Southern states occur in early summer. Moths prefer to lay eggs in moist, shady areas where small grains or grasses have lodged or been damaged by hail or wind. Armyworms feed at night and hide under vegetation or in loose soil during the day. To scout for armyworms in grains, part the plants and inspect the soil for fecal pellets. If pellets or feeding damage is found, look for larvae under plant trash, soil clods or in soil cracks.

**The action threshold for armyworms in wheat is when 4 to 5 worms per square foot are present.** A listing of insecticides registered for armyworm control in small grains is available from the ND Field Crop Insect Management Guide 2011, E-1143, NDSU Extension Service.

<http://www.ag.ndsu.edu/pubs/plantsci/pests/e1143w1.htm>



Armyworm adult and larva  
(Courtesy of G. Fauske, Dept.  
Entomology, NDSU)

### SCOUT FOR PEA APHIDS

Pea aphids are fairly abundant this year as are other species of aphids, so pea fields should be scouted during flowering. They are small, about 1/8+ inch long, and pale green. Pea aphid feeding during the flowering and early pod stage can result in lower yields due to less seed formation and smaller seed size. Protein content and other quality issues do not appear to be affected.

Scouting for aphids in pea is conducted using either a sweep net or examining the number of aphids per plant tip when 50 to 75 percent of the peas are flowering. Take ten 180 degree sweeps using a 15-inch sweep net or check at least five 8-inch plant tips from four different locations in the field. Population estimates should be calculated by averaging counts taken from four separate areas of the field.



Pea aphid (Courtesy of P. Beauzay, Dept.  
Entomology, NDSU)

Economic thresholds may vary depending on the value of the crops and cost of control, as well as variation in potential seed weight caused by variation in precipitation and heat stress. **The economic threshold in peas is 2 to 3 aphids per 8-inch plant tips, or 9 to 12 aphids per sweep (or 90 to 120 aphids per 10 sweeps), at flowering.** If the economic threshold is exceeded, a single application of insecticide when 50% of plants have produced some young pods will protect the crop against yield loss and be cost-effective. Cultivars of peas may also vary in their tolerance to feeding by pea aphids, thus economic injury levels may differ between cultivars. However, research has shown that insecticides applied when pods first form protects pea yield better than earlier or later applications. Control at the early pod stage provides protection through the pod formation and elongation stages, which are very sensitive to aphid damage.

A listing of insecticides registered for pea aphid control in field peas is available from the ND Field Crop Insect Management Guide 2011, E-1143, NDSU Extension Service at:

<http://www.ag.ndsu.edu/pubs/plantsci/pests/e1143w1.htm>

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#### **CORN DEVELOPMENT ACCELERATES WITH WARMER JULY WEATHER**

According to June acreage estimates published by NASS USDA, 2.3 million acres of corn were planted in 2011. Of the planted acres 2.1 million acres will likely be harvested. Presumably the difference between planted and harvested acres is related to losses from excess water which has been significant in most of the state. Though there is a record number of prevent plant acres in North Dakota this year, nearly all of the planned corn acres were planted (96%). More than half of these acres, however, were planted after May 22<sup>nd</sup>, later than is optimum for yield and grain moisture at harvest. In mid-June, I reported that the state had accumulated about 15 to 25% less growing degree days (GDDs) than the long term average and I expressed concern that the late planting coupled with cool weather in May and June we could expect a late harvest and high grain moistures at harvest. With the recent warm weather that has moved into the state, corn development has accelerated and the outlook does not look quite so bleak, at least for parts of the state. Assuming a May 1<sup>st</sup> planting date, at Prosper GDDs are running only 32 behind the long term average (as of July 15) and with the heat that is expected next week we could very likely catch up to the normal (Table 1). Unfortunately, GDDs at Minot and Carrington still lag significantly behind normal. They are in need of warmer weather if corn growth is going to catch up to where it needs to be.

As mentioned earlier much of the corn in the state was planted late. Corn planted around May 20<sup>th</sup> generally is lower yielding by 15 to 20% than earlier planted corn. The late planting this year has also had a big impact on corn development (not much corn was knee high by July 4<sup>th</sup>). In fact, when planting was delayed until May 22<sup>nd</sup> (more than half of the acres were reportedly planted after that date), corn was exposed to about 150 less GDDs than corn planted on May 1<sup>st</sup>. The combined effect of late planting and cooler than normal weather at Carrington is significant and worrying, and slightly less so at Minot and Prosper. On a brighter note, GDDs accumulations are 75 or more ahead of 2009 (assuming a May 1<sup>st</sup> planting date) for both Carrington and Prosper, so there is hope that we won't have to wait until December (or later) to harvest this fall if the recent weather pattern continues.

Corn GDDs are highly correlated to corn development. GDD accumulations max out on the upper end when temperatures exceed 86 degrees (i.e. 100 degree days don't hasten corn development any more than 86 degree days). Warm night temperatures (up to 86 degrees), on the other hand, can contribute significantly to greater GDD accumulations and corn development. There is a good description on how corn GDDs are calculated in NDAWN at <http://ndawn.ndsu.nodak.edu/help-corn-growing-degree-days.html#vdcoadfnngdd>.

Table 1. Growing degree day(GDD) accumulations for three locations in ND for 2011 compared to normal and GDD accumulations in 2011 between May 1<sup>st</sup> and May 22<sup>nd</sup>.

Location	GDDs May 1 to July 15, 2011	GDDs May1 to July 15, Normal	Departure from normal, 2011	GDD Accumulations May 1 to May 22
Prosper	1043	1075	-32	170
Carrington	888	1065	-177	156
Minot	864	956	-92	137

### STRONG WINDS CAUSES SIGNIFICANT DAMAGE TO CORN CROP

Last week winds reported to be as high as 70 mph associated with the storm system that moved through the southeastern portion of the state caused significant damage to corn crops. At this early stage of corn development, high winds can cause root lodging or greensnap (stem breakage). Root lodging occurs most frequently during the mid-growing season before brace roots are established and when soils are wet. Greensnap, on the other hand, occurs when the force of the wind is sufficient to cause the stalk to break. Greensnap is most common during rapid vegetative growth and before stems mature and are lignified. Breakage usually occurs on the lower portion of the plant, particularly before tasseling. Most of the damage that I saw this past week was due to greensnap. In fact I did not see any root lodging during my recent travels. Plants that have been “snapped” (see accompanying picture) will not produce an ear, though some tillering may occur in fields that were heavily damaged to give the impression that the crop is filling in the missing plants.

In 2008 to 2010 we conducted research in Prosper to determine the yield loss associated with corn removed at various vegetative stages. These data suggest that there will be only limited compensation in yield by plants not removed (Table 1).

There are no data that I am aware of that suggests applying a fungicide to fields damaged by greensnap would be beneficial. The plants that have been snapped will not produce an ear, and the remaining plants will not be more prone to diseases that are effectively controlled by fungicides.



**Table 1.** Percent yield reduction associated with differing levels of corn plant removal at different growth stages, Prosper, average of 2008 and 2010.

Growth stage	Percent removal		
	25%	50%	75%
	-----(% reduction in yield)-----		
V5	14%	29%	45%
V8	14%	37%	55%
V11	17%	36%	55%
V14	19%	41%	59%

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## UPDATED CANOLA PRODUCTION FIELD GUIDE

Producers, agricultural consultants and others interested in agriculture can use a new updated canola production (spiral bound) pocket field guide to obtain the latest information about canola production. The previous field guide was published in 2005 and was in need of major updates, especially on the canola diseases of blackleg and sclerotinia, canola insects, weed management and desiccation at harvest, and other management issues.

NDSU State Extension staff and other canola specialists wrote the revised and reviewed guide.

The field guide also has a photo section at the back of the publication with pictures of weeds, insects, and diseases.

The publication is a comprehensive guide for those considering or are growing canola. Some of the topics discussed include canola varieties; growth stages; field selection; planting dates; soil fertility requirements; weed, insect, and disease management and control; frost tolerance and damage; swathing and harvest management; resource contacts and publications; and useful websites.

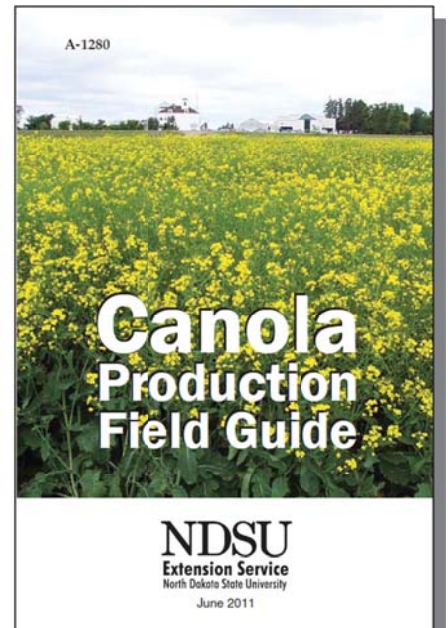
North Dakota growers can order a free copy of the pocket guide from the Northern Canola Growers Association by phone at (877)-585-1671 or email [info@northerncanola.com](mailto:info@northerncanola.com).

A complimentary copy also can be obtained from the Research Extension Centers in Carrington, Dickinson, Hettinger, Langdon, Minot and Williston and at local county NDSU extension offices.

A web version of the guide can be found at [www.ag.ndsu.edu/pubs/plantsci/crops/a1280.pdf](http://www.ag.ndsu.edu/pubs/plantsci/crops/a1280.pdf).

The guide can also be ordered from the NDSU Distribution Center for \$6.00 per copy, which includes shipping and handling. Call (701) 231-7882 or e-mail [NDSU.DistributionCenter@ndsu.edu](mailto:NDSU.DistributionCenter@ndsu.edu) for information or order online at [www.ag.ndsu.edu/pubs](http://www.ag.ndsu.edu/pubs).

The 2011 edition of the "Canola Production Field Guide" (A-1280) was partially funded by the Northern Canola Growers Association and produced by the North Dakota State University Extension Service.



Front cover of the 2011 Canola Production Field Guide, the size of the booklet is about 4 x 6 inches.

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## SMALL GRAIN DISEASES

Field scouts continue to look at wheat and barley for leaf and head diseases. Their observations are posted bi-weekly for on the ND IPM web page, at: <http://www.ag.ndsu.nodak.edu/aginfo/ndipm/>

NDSU field scouts looked at 137 wheat fields during the week of July 11-15. The average growth stage was just beyond boot, but ranged from tillering to soft dough. They are still finding the most common disease to be tan spot, but Septoria infections are also showing up on more advanced wheat, bacterial leaf streak and barley yellow dwarf symptoms are still common. The observed Fusarium head blight in 5.1% of fields surveyed, with an average severity of 1.7%. The scouts did not report observations of leaf rust during this second week of July.

In my observations in the western part of the state during the week of July 11, symptoms of barley yellow dwarf virus were very evident in research plots and in some fields. A commercial winter wheat field near Dickinson had heavy tan spot pressure on the flag leaves, and in winter wheat plots at Williston, a gamut of leaf diseases were present, including leaf rust, stripe rust, *Stagonospora (Septoria) avenae* blotch, and tan spot. Winter wheat plots and the commercial field that had a lot of fungal disease had not been sprayed with a late season fungicide. Spring wheat and barley in the plots had considerable amount of barley yellow dwarf infection.

**Risk of Fusarium head blight in wheat and DON (vomitoxin) in barley** increased again over the weekend of July 15-17, because of the rains and high dew points that occurred in many areas. Moderate to high risk exists in much of the eastern half of ND for wheat that is susceptible to moderately susceptible to the disease and hasn't flowered yet; DON (vomitoxin) risk for barley in many areas also is high if the barley is headed out but not yet reached dough stages. The optimum time of day for fungicide application now is early evening, when the temperatures, ultra violet radiation, and hopefully, the winds, have diminished.

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#### **RETURN OF CONDITIONS FAVORABLE FOR WHITE MOLD**

Historically, white mold has been less severe when temperatures are in the 90's during bloom. This last week, many of the dry beans and soybeans had not canopied yet, which would further reduce the ability of white mold to infect crops. However, we have had frequent rains and ample soil moisture, making us primed for infection once the temperature drops. The 7-day forecast indicates temperatures will be in the favorable range for white mold infection for a week. Fungicide management of the disease may be important, *particularly in dry beans*, as they enter bloom. Key environmental factors for determining a fungicide application include 1) wet soil prior to bloom, 2) high humidity during bloom (rain, fog, dew), and 3) temperatures below about 85F. A history of disease indicates strongly that white mold may be an issue if environmental conditions are favorable.

#### **WHITE MOLD IN SOYBEANS**

Fungicide applications made at early to mid-bloom have been the most effective at reducing disease. Economic return for fungicide application(s) on dry beans is frequently cost effective, and I would expect that many dry bean growers are spraying for disease management. However, economic returns on soybeans are less consistent.

The North Dakota Soybean Council supported a very thorough fungicide evaluation for soybean white mold in 2010. The trial was co-coordinated by Dr. Michael Wunsch, plant pathologist at the NDSU Carrington Research Extension Center and Mr. Blaine Schatz, agronomist and director of the station. The data showed a positive yield impact and disease reduction when Endura (Bayer) or Cobra (Valent) were applied singly, and with multiple applications of other chemicals. However, many other fungicides were inconsistent. The data is available at the link below. However, this data should be viewed with some caution; disease pressure in this trial was artificially high due to inoculation with the pathogen and mist irrigation. It is unlikely that commercial fields will have such high disease pressure (Non-treated controls had above 90% incidence), and thus, most fungicides were overwhelmed. Similarly, it would not be recommended to apply multiple fungicide applications on soybeans; indeed, even one application is often a coin flip.

To access the fungicide trial, click the link below and scroll to the bottom of the page. The second to last trial is the one i spoke of above. The last trial is a soybean white mold trial taking a closer look at Domark and Cobra, both Valent products. <http://www.ag.ndsu.edu/CarringtonREC/agronomy-1/research-documents/plant-pathology>

## SUNFLOWER DOWNY MILDEW SAMPLES REQUESTED

NDSU-IPM scouts have detected Sunflower Downy Mildew in 25 of 30 scouted fields so far this season. The disease continues to thrive for two main reasons, a new race able to overcome commonly used sources of resistance was recently identified and frequent rains have been favorable for infection.

Dr. Tom Gulya, USDA Sunflower Pathologist, is requesting downy mildew samples from fields with greater than 10% infection. Dr. Gulya is collecting samples to determine where the new race is present and monitor the pathogen for development of resistance to fungicides. Currently, no resistance has been detected to either Idol (Bayer) or Apronmaxx (Syngenta).

Dr. Gulya's instructions are below.

*Samples should consist of 3 to 4 leaves from a single plant, each showing large areas of spores (white area on the underside). Leaves from two to four plants are sufficient for testing. Leaves should be placed in a plastic bag, lined with paper towels, and the location (county) of the field written with permanent marker on the outside of the bag.*

*It is important that the samples be kept cool at all times after they are collected, preferably in an ice chest in the vehicle. Additionally, they should be shipped to the USDA lab by overnight mail (USPS, UPS, Fed Ex) to arrive in good condition. Please do not send samples on a Friday, as the package will not be delivered until Monday. Send all samples to: Dr. Tom Gulya/ Megan Ramsett, USDA Northern Crop Science Lab, 1605 Albrecht Blvd. N, Fargo ND 58102-2765. Also: please label the package with "PLANT MATERIAL. OPEN or REFRIGERATE UPON ARRIVAL"*

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## COVER CROP N CREDIT ESTIMATION

In response to a question at a Forman field day late last week, here are a few methods to estimate cover crop biomass and N value.

**Actual measurement:** For those consultants whose acreage base was substantially cut this growing season, this would be a useful thing to do for acres not cropped.

Make 1 foot square frames out of PVC, metal or something substantial and cheap.

-Throw them out into the cover crop and clip or cut the vegetation to the soil surface.

-Bag the material and keep cool until you get dry them

-After drying, weigh the biomass.

If you are really scientific about the results, send them in for N analysis.

If you understand the variability involved will probably overwhelm the plant analysis, assume that any green vegetation has about 4% N.

-Every 20.8 grams of dry matter from a square-foot equals 2,000 lb dry matter/acre, or

Each gram from a square-foot equals about 98 lb/acre dry matter

Dry matter is 4% N, so

$(\text{Weight dry matter/acre} \times 0.04 \text{ lb N/lb dry matter}) = (\text{Weight N/acre})$

According to John Moraghan's work from about 2005 (Sugarbeet R&E Reports on the web), about 1/3 of the N you find will be available under conventional till for next year's crop. A rule of thumb for no-till is that about 1/5 of the total will be available under no-till for next year's crop (my estimate).

**Estimating without the work:**

If you have 100% ground cover of anything broadleaf that is green and it is 6 inches tall at the time of kill, you have 2,000 lb/acre dry matter. For every inch above that, add 150 lb/acre dry matter. For the N content, use 4% N again to calculate total N, then take the fraction appropriate for your tillage from above to determine roughly what might be expected for the crop. If the broadleaf cover crop is yellow (radish on low N soil), you will not receive any appreciable N credit.

For rye and most small grain cover crops, 8 inch height, 100% ground cover is about 2,000 lb/acre dry matter. If it is green, assume about 4% N. If it is yellow-green or yellow, you will not have any appreciable N credits.

If ground cover of either broadleaf or grass is less than 100%, make the appropriate adjustment in dry matter content.

**UNUSUAL MID-SEASON CORN STRIPING ON HIGH-TESTING ZINC SOILS**

I have been in a number of fields with distinct striping characteristic of zinc deficiency in corn fields in eastern North Dakota, primarily in high clay soils. The corn in these fields appears green from the road, but on close inspection the striping is easy to see. The corn with these symptoms was between 2 and 4 feet tall. I know that the fields where I saw these symptoms had soil tests well above 1 ppm DTPA-extract, which should be fine and most received some Zn at planting. I think what has happened is that the root system is so shallow and restricted due to the high seasonal water table, that the root mass is not large enough to explore the soil volume normal for this time of year. It's like trying to grow corn in a pot. I have not seen these symptoms in well-fertilized medium textured soil with better drainage. I do not know if amending these fields would help. I keep thinking that it will dry out soon, and any zinc fertilizer we apply would be a waste of time. Then it rains again. This might be a year to try a foliar zinc spray just to see. One to 2 quarts of any chelated material should work if anything will. Normally, I would not suggest such a trial on a well-fertilized field.

**LAST COMMENTS ON PROTEIN ENHANCEMENT IN WHEAT FOR THIS SEASON**

The weather has been exceptionally warm and humid for this part of the country. I do not even remember this length of heat and humidity in Illinois, let alone my tenure in North Dakota. Our recipe calls for 10 gallon UAN and 10 gallon water applied 'during the cool of the day'. Obviously with night temperatures approaching 80 degrees, we have no 'cool of the day'. But it is cooler sometimes relative to the rest of the day. If burning the flag leaf post-anthesis showed yield reductions, we would not recommend the recipe at all. However, NDSU work has shown that even with substantial leaf burn, no yield decrease was seen. Do not tempt fate by spraying all day in a day like today when the mid-day heat index is 110 degrees F. However, if a person uses common sense and sprays very late in the evening, maybe all night, certainly in the morning between 4 AM and 9AM, any burn will be minimized. Expect some burn this year. It's superficial and so far the potential benefits outweigh any risk.

Finally, there are still people who are using 1-2 gallons/acre of slow-release N materials to enhance protein. Careful field experiments, replicated by people with no ax to grind either way have seen no benefit to the application of low rates of these materials that only contain 3-6 lb N/acre. We have seen no foliar benefit over traditional products in N efficiencies. One study that applied one of these products at the 30 lb N/acre 'recipe' rate (10 gallon UAN contains 30 lb N) showed that this rate of slow-release was similar in protein to the UAN rate in the recipe. However, the cost of application of 30 lb N as a slow-release product prohibits its use. 1-2 gallon per acre is just not enough N to make a difference. It is a waste of money. Don't do it.

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## **NPDES PERMITS**

Many of you are aware of potential regulation requiring permits prior to applying pesticides on, in, around water. With the water issues the entire state is dealing with I thought an update on situation would be helpful. The following is an update by Dr. Mike Barrett, Pres of the Weed Science Society of America on EPA's National Pollutant Discharge Elimination System (NPDES) General Permit.

This issue stems from a January 7th, 2009, Sixth Circuit Court ruling (National Cotton Council v. EPA) that struck down EPA's 2006 published Rule [Application of Pesticides to Waters of the United States in Compliance with FIFRA" (40 CFR 122)] and mandated that pesticide applications to, near or over water fall under the Clean Water Act (CWA) and, as such, require NPDES (National Pollution Discharge Elimination System) Permits. As a result, on October 31, 2011 court-ordered NPDES permits will be required by the U.S. EPA for pesticide applications "to, over, or near" water. Among other impacts, this act greatly increases the burden on invasive species control for forest protection and in the riparian corridor without the potential to actually reduce pesticides in water. EPA has repeatedly stated that they already use the full regulatory authority granted under FIFRA to ensure that pesticides do not cause unreasonable adverse effects on human health or the environment, including our nation's water resources. But, the Agency must now comply with the court order in National Cotton Council v. EPA. The paperwork burdens imposed by the NPDES permit will increase the costs of controlling pests. Just as problematic, the significant penalties dictated by the CWA were never designed for these types of organizations and would apply to mere paperwork and reporting violations. Public health and other state and local government organizations will be vulnerable to these CWA penalties, fines, citizen lawsuits and defense costs without quick Senate action. In an April 19, 2011 letter to Senators Boxer, Inhofe, Stabenow and Roberts, the Association of American Pesticide Control Officials, the Association of States & Interstates Water Pollution Control Administrators, the National Association of State Departments of Agriculture and the National Association of State Foresters urged the Senate to join the House of Representatives to take legislative action to rectify this situation and to work with their colleagues to pass new rules to prevent this dual regulation.

House bill, H.R. 872 "Reducing Regulatory Burdens Act of 2011", would eliminate the overlapping permit requirements resulting from the National Cotton Council v. EPA (6th Cir. 2009) case. H.R. 872 would amend the FIFRA and the CWA to clarify that CWA permits are not needed when a pesticide is applied in accordance with a FIFRA-approved label. This bill adequately addresses the issue and was passed overwhelmingly by the House of Representatives earlier this year. The Senate Agriculture Committee has favorably moved on H.R. 872 and the bill now moves to the Senate floor. Several grower and industry organizations support the Senate to join the House of Representatives to quickly review and pass H.R. 872 to ensure that duplicative permitting is not required under the CWA and FIFRA as unfortunately directed by the National Cotton Council v. EPA court decision.

In summary, the 6th Circuit had granted a stay for April 9, 2011. This meant that persons applying pesticides on, in, or to water without an NPDES permit could be found in violation of the CWA. The Court subsequently extended the deadline to October 31. Unless HR 872 passes, the NPDES permit requirements will come into play after October 31.

## **DAMAGE CAUSED BY PIGWEED GOING TO SEED**

Though difficult to do, keeping herbicide-resistant pigweeds from producing seed will reduce resistance in fields. Pigweeds produce between 500,000 to 2 million seeds per plant but the seed has a relatively short four-year viability in the soil; therefore, keeping pigweeds from developing seeds is being called by some "Zero Tolerance". The Zero Tolerance concept prevents the seed bank from being replenished by stopping plants from forming seed and depleting the seed bank over time.

Some have tried to eliminate herbicide-resistant pigweed seed with deep burial and then plant a cover crop to prevent germination until seed is no longer viable but that is not the economically feasible to most. The Zero Tolerance program may have more success potential, but the problem is that hand hoeing or roguing with manual labor is required for Zero Tolerance. In the absence of hand-hoeing, we use herbicide as pre-plant, post-emerge and layby herbicide applications to attempt Zero Tolerance.

The concept works in a research environment - In a research study of a 68-acre plot, researchers completely controlled pigweed in 2010. The number of pigweed in 2011 was approximately 10 percent of the population last spring when Zero Tolerance was initiated. The manual labor for the field involved four people hand-hoeing the field four times in 2010. The 68-acre field required about two hours of hand-hoeing per acre. The rate at which pigweed infestations were reduced was impressive was exactly what was predicted: 90% reduction of the seed bank in the first year. The concept using manual labor works on small-acreage but this strategy is not feasible to most ND growers where 1,000s of acres are grown by each grower. As the number of herbicide choices decrease with resistant wild oat, green foxtail, waterhemp, ragweed, kochia, and lambsquarters, perhaps we can keep this concept in mind to identify small patches of resistant weeds, kill those plants (and resistant genes) by whatever means necessary, and use all available weed control methods (chemical, biological, cultural) to avoid/delay resistant from increasing in ND.

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#### DISEASES OF APPLE TREES – BLACK ROT

Many people have been concerned in the last few weeks regarding problems with apple trees – both edible apples and ornamental crabapples – especially from the western part of the state. The most-common disease pests of apples are fireblight, apple scab and black rot canker. Black rot canker has been the most common issue, and the rest of this article will cover this disease and the associated problem known as frog-eye leaf spot. For more information about fireblight and apple scab, see the NDSU Extension publication “Insect and Disease Management Guide for Woody Plants in North Dakota” (<http://www.ag.ndsu.edu/pubs/plantsci/trees/f1192w.htm>).

Black rot is a canker disease caused by the fungus (*Botryosphaeria obtusa*). When the fungus infects stems or branches, it causes cankers which tend to grow more quickly along the length of the branch, compared to going around the branch. A canker will typically be sunken, have darkened bark, and have small bumps that are the fruiting bodies of the fungus. As the canker develops and expands around the branches, the leaves on the girdled branches will turn bright yellow and fall to the ground, even in the middle of summer (Figure 1). As the canker continues to develop, entire



Figure 1. A black rot canker killed the leaves on this branch of an ornamental crabapple tree. Black rot cankers extend more along the length of a branch rather than around it. Eventually, the canker may grow into the main stem and kill the entire tree. Photo by Joe Zeleznik.

branches or stems will be girdled and killed. Infections can also occur in the outer bark, which is dead. Outer bark infections are not sunken and cause no damage, but contain fungal fruiting bodies that can serve as a source of spores that cause new infections. Infections in the outer bark can develop into cankers if the tree is wounded or stressed.

The fungus also causes a leaf disease called frog-eye leaf spot (Figure 2). Frog-eye leaf spots are typically chocolate brown with a dark ring around the edge of the spot, and the margin of the spot is sharply defined. The infections on leaves typically occur early in the season and take place during cool, wet weather. If there are several leaf spots, or if leaf spots occur near the leaf petiole, the leaf will turn yellow and drop.

New infections on branches and stems occur through wounds – pruning cuts, hail damage, or tissue damaged during the previous winter. While old infections cannot be cured, there are several steps that we can take to prevent new infections or slow development of cankers. Avoiding stress to the tree allows the tree to resist initial canker infection and expansion of existing cankers. Be careful to not wound the tree with mowers or weed trimmers and minimize the use of herbicides – both regular herbicides and those used in weed-and-feed formulations with fertilizer – within the dripline of the tree. If the cankers are confined to a manageable level, branches with cankers should be pruned out, several inches below the most basal portion of the canker. Do not leave branch stubs that can serve as an entry point for the fungus. Pruning apple trees is best accomplished during the dormant season to minimize chances of infection by fireblight. If apple trees are pruned during the growing season, applying streptomycin or a copper-based fungicide will help reduce the risk of fireblight infection. If branches are broken during a windstorm or if bark is damaged by hail, treating the wounds with a copper-based fungicide will help reduce the risk of infection by both black rot and fireblight. Pruning of outer bark infections is not practical because they are usually too numerous and are not yet causing damage; instead, outer bark infections are best taken as an indication that care should be taken to avoid wounds and stress to the tree. If the fruit load is very heavy, consider thinning out the number of fruits to about one apple per six inches of branch.

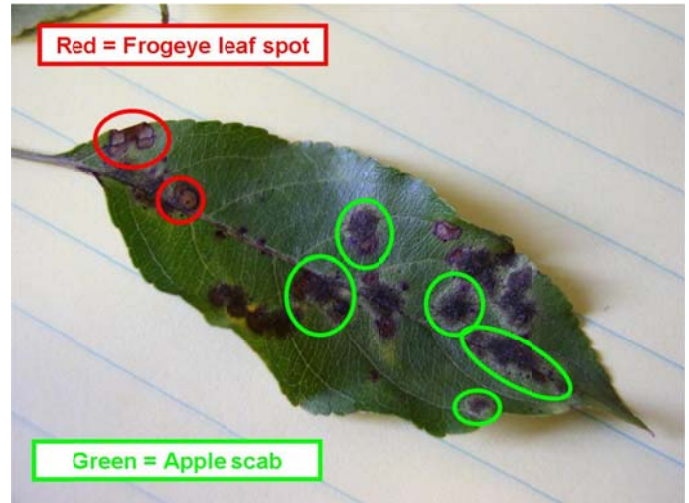


Figure 2. Frog-eye leaf spot (red circles) and apple scab (green circles) on the same leaf. The frog-eye leaf spot is identified by the sharp margin on the edge of the light-brown lesion, while apple scab lesions have a diffuse margin. Photo by Joe Zeleznik

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## **SOUTHWEST ND**

Southwest North Dakota this past week has been more tropical in terms of weather conditions than semi-arid. High heat warnings and watches (combination of high temperatures and humidity) occurred over the past 3 or 4 days. One livestock producer reported the death of cows due to heat stress. Rainfall at NDAWN locations in southwest North Dakota varied considerably with greatest precipitation occurring at Watford City at 2.48 inches. Hazen received 1.53 inches followed by Beach at an inch. Dickinson and Dunn Center received about a half inch and all other reporting stations reported 0.10 or less.

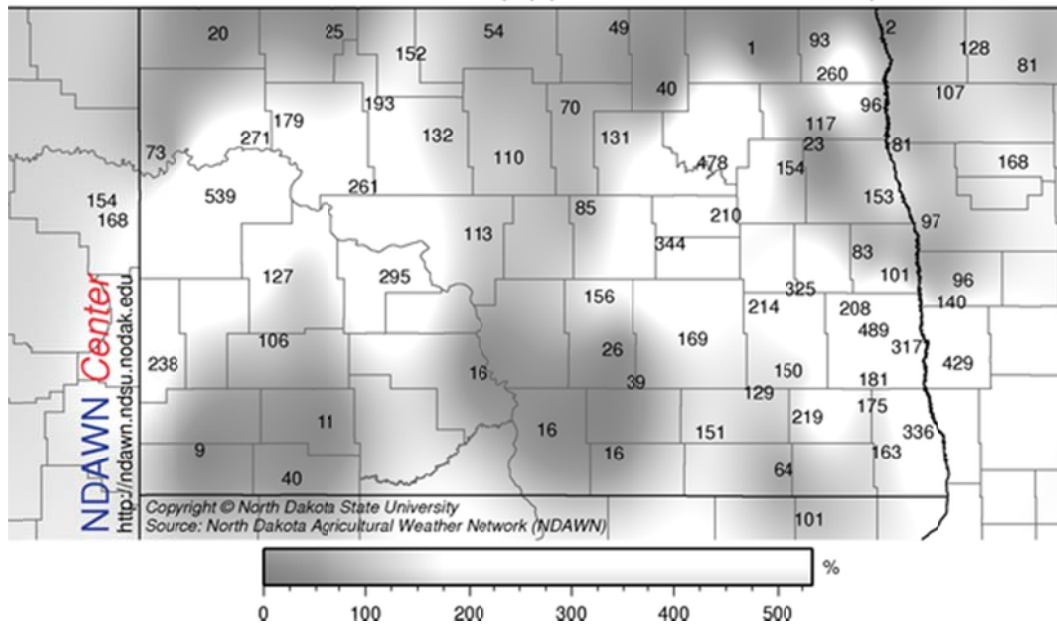
Since June 1 about 20% of the wheat and barley samples submitted for an ELISA test from southwestern counties to the NDSU Plant Diagnostic Lab have been confirmed to be infected with Barley Yellow Dwarf Virus. The remaining samples have been infected with Wheat Streak Mosaic Virus/High Plains Virus. At the time some of the samples submitted for testing appeared to have Barley Yellow Dwarf Virus, this disease was not detected but Wheat Streak Mosaic Virus/High Plains Virus was detected. This points out the need for an accurate diagnosis and symptoms aren't always the best method to determine the cause. Turnaround time for an ELISA test from the NDSU Plant Diagnostic Lab is about three days from samples sent via mail to the lab. This should still provide enough time to make a treatment to control aphids if Barley Yellow Dwarf is found in an area. If the symptoms seen are the result of Wheat Streak Mosaic Virus and/or High Plains Virus a pesticide application will be of no value to the producer as these diseases are spread by the wheat curl mite which can't be controlled effectively with a pesticide. Fields that have headed out are beyond need of an insecticide application to control aphids that spread Barley Yellow Dwarf. Producers should be concentrating on late seeded fields that have not reached the heading stage for scouting and aphid management.

Canola has completed flowering, winter wheat is beginning to turn while spring wheat development is ranges from flag leaf to watery ripe stage. Hay harvest is well underway. Several producers have planted cover crops to utilize excess water in fields that were prevented planting.

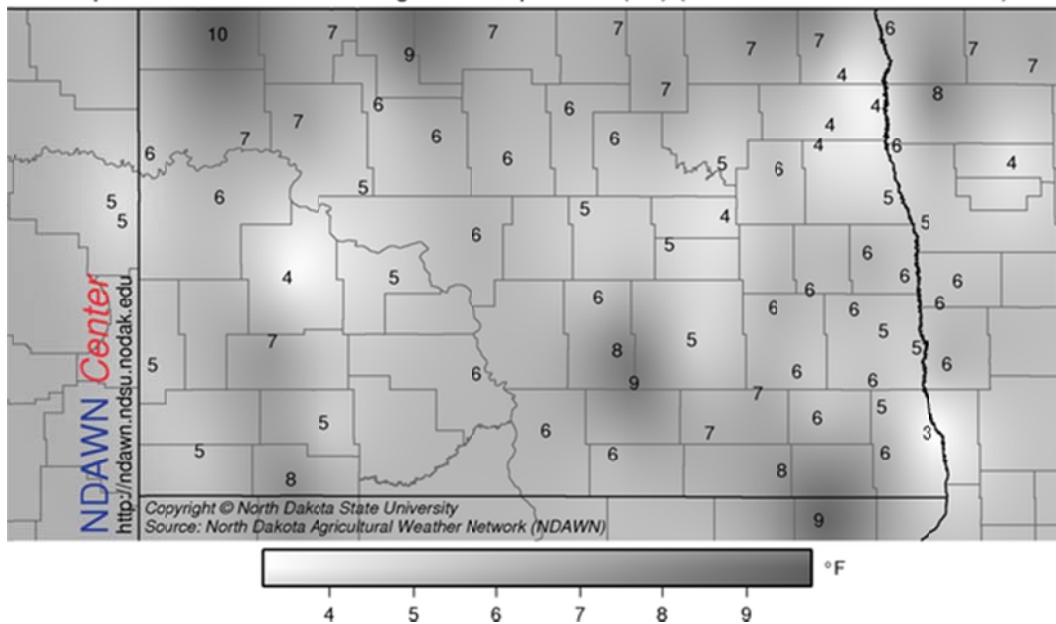
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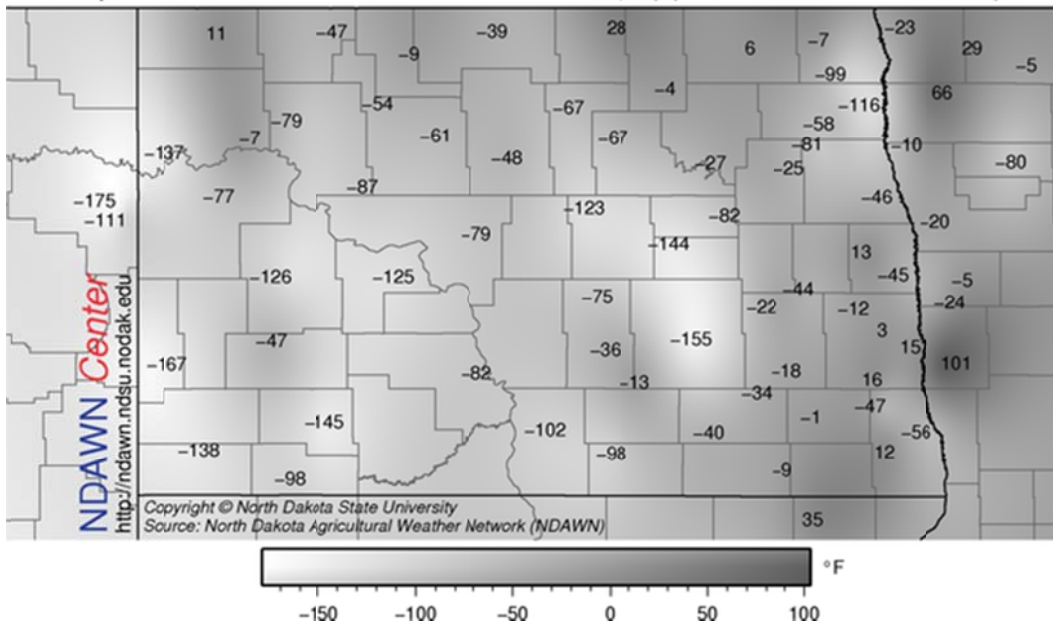
Percent of Normal Rainfall (%) (2011-07-13 - 2011-07-19)



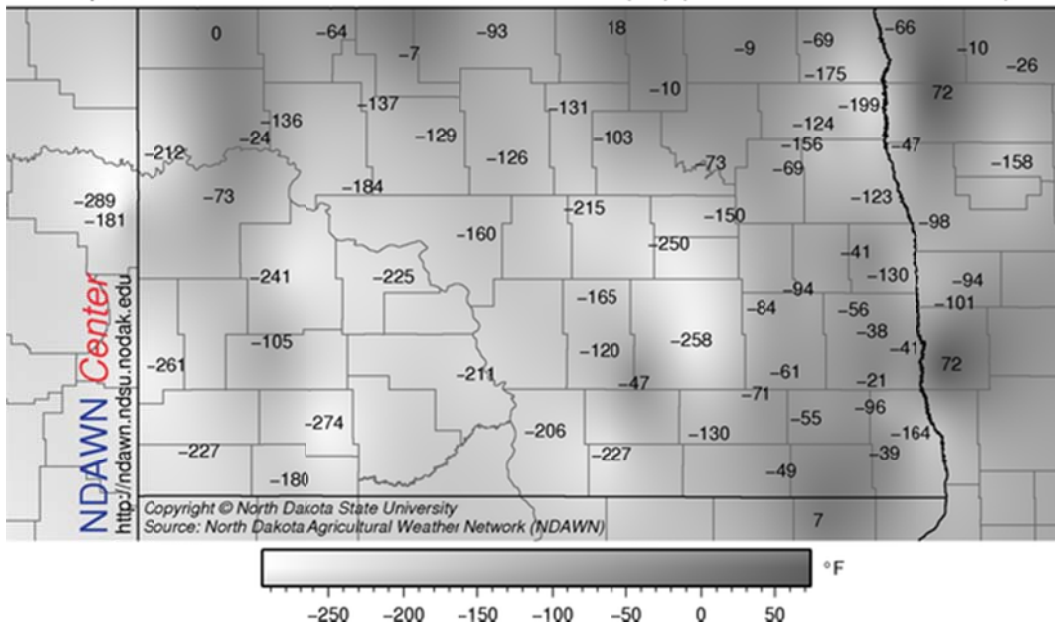
Departure from Normal Average Air Temperature (°F) (2011-07-13 - 2011-07-19)



Departure from Normal Corn Accumulated GDD (°F) (2011-05-02 – 2011-07-19)



Departure from Normal Wheat Accumulated GDD (°F) (2011-04-16 – 2011-07-19)



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