North Dakota State University
CROP & PEST REPORT
NDSU EXTENSION

No. 13 July 28, 2022

Inside this Issue...

AG NDSU FIELD DAYS

Several North Dakota State University Research Extension Centers annual field days are set to occur soon. The events take place at the Research Extension Center sites across the state and feature speakers, presentations and tours covering a diverse array of topics. NDSU's 15th President, David Cook, will be attending this year's field day events.

The dates and locations for the field days are:

August 4 – CREC Oakes Irrigation Research Site – Oakes
(8:30 a.m.-Noon CDT)

August 9 – NDSU Horticulture Research & Demonstration Gardens – Fargo
(3-7 p.m. CDT plants, local foods and outdoor spaces)

*September 10 –NDSU Arboretum near Absaraka (12-5pm CDT trees and ornamentals) pre-registration required

*Note: This event has had a change of place and time

entomology

RED HEADED FLEA BEETLE IN SOYBEAN, CORN AND WHEAT

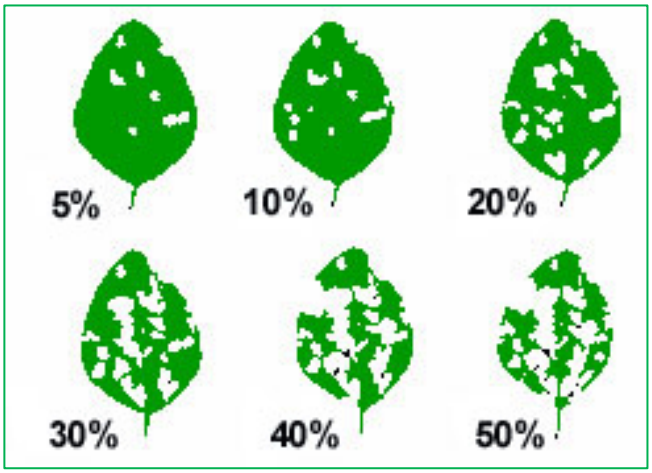
We have received several calls, emails, and texts about the red-headed flea beetle (*Systena frontalis*) causing defoliation in soybeans and chewing on silks in corn. We also had one report in wheat. The red-headed flea beetle is about $^{1}/_{6}$ inch long and dark black with a reddish head and readily hops around. It feeds on over 40 different host plants including cabbage, beans, beets, corn, alfalfa, potatoes, nursery crops, cranberry and many weed species. It overwinters in the egg stage in the soil. Eggs hatch in June and larvae feed on the roots. Larvae pupate and then adults emerge in July-August and feed on foliage until September. Adults deposit eggs in soil, which overwinter. There is only one generation per year.

Adult red-headed flea beetle (P. Beauzay, NDSU)

The red-headed flea beetle is not typically an economic insect pest in soybeans, corn or wheat. It has been reported in Minnesota and South Dakota. Extension reports from other states indicate that the adult stage is readily controlled by foliar insecticides registered in different crops. An action threshold for determining the need for a rescue treatment would be based on percent defoliation and the stage of soybean: 30% in vegetative stages (prebloom) and 20% in flowering to pod-fill. If pod feeding is observed then 10% defoliation.

Foliar defoliation in soybeans caused by the adult red-headed flea beetle (P. Beauzay, NDSU)

While there isn't any developed threshold for the red-headed flea beetle in corn, we can use the adult corn rootworm threshold of 25-50% of the plants with clipped silks during pollen shed as to when control would be justified. With the high market value of corn, the lower percentage would be more feasible. This flea beetle is becoming more common of an insect pest of soybean and corn.



Patrick Beauzay
Research Specialist

Janet J. Knodel
Extension Entomologist

IPM INSECT TRAPPING UPDATE

We will be posting and reporting weekly trapping results for insect pests of wheat, canola and sunflower on the NDSU Extension ***IPM website*** and in the ***Crop & Pest Report***.

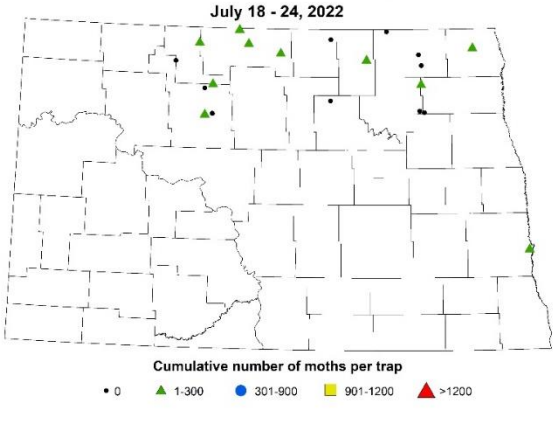
Wheat: Pheromone traps for true armyworm and black cutworm continue to be **low for both moths** at 18 trap sites in 18 counties. True armyworm traps captured a total of 69 moths at six sites and black cutworm traps captured a total of 8 moths at two sites. See maps on IPM website. Wheat growth stage ranged from early flowering to kernel watery ripe.

Canola:
IPM Scouts have placed pheromone traps out for bertha armyworm and diamondback moth at 21 trap sites in 12 counties, mainly in northern canola growing areas (Table 1). Canola growth stages ranged from early to late flowering.

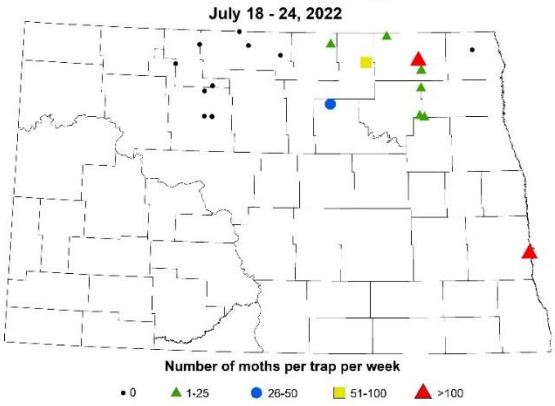
Trap catches for **bertha armyworm** continue to be low, <10 moths per trap per week, with 43% of the trap sites capturing moths. Bertha armyworm threshold for scouting is based on the cumulative number of moths captured over the season, which are low, below 300 cumulative moths, per season (non-economic). See scouting article for bertha armyworm larvae in canola, in the past *Crop & Pest Report* #11, July 14.

Trap catches for **diamondback moths** increased with a total of 416 moths for all trap sites compared to a total of 247 moths last week. Moths were captured at 43% of the trap sites, mainly in eastern ND. **When diamondback moth trap catches are above 100 moths per trap per week, canola fields should be scouted for larvae.** See the scouting article for diamondback moth larvae in canola in the past *Crop & Pest Report* #11, July 14.

Bertha Armyworm Trapping Network



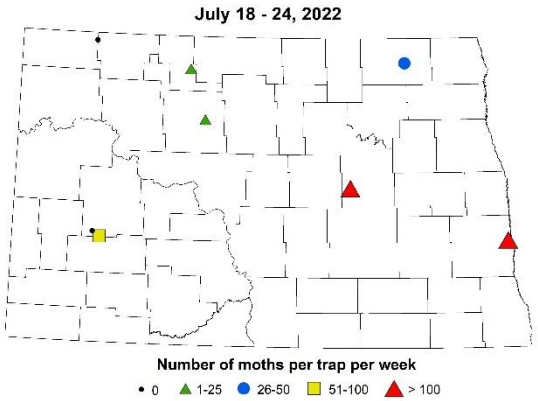
Diamondback Moth Trapping Network



Sunflower:
IPM Scouts have placed pheromone traps out for banded sunflower moth, Arthuri sunflower moth and sunflower head moth at 8 traps site in 7 counties. Sunflower growth stage ranged from late vegetative to R2 (bud <1 inch from leaf).

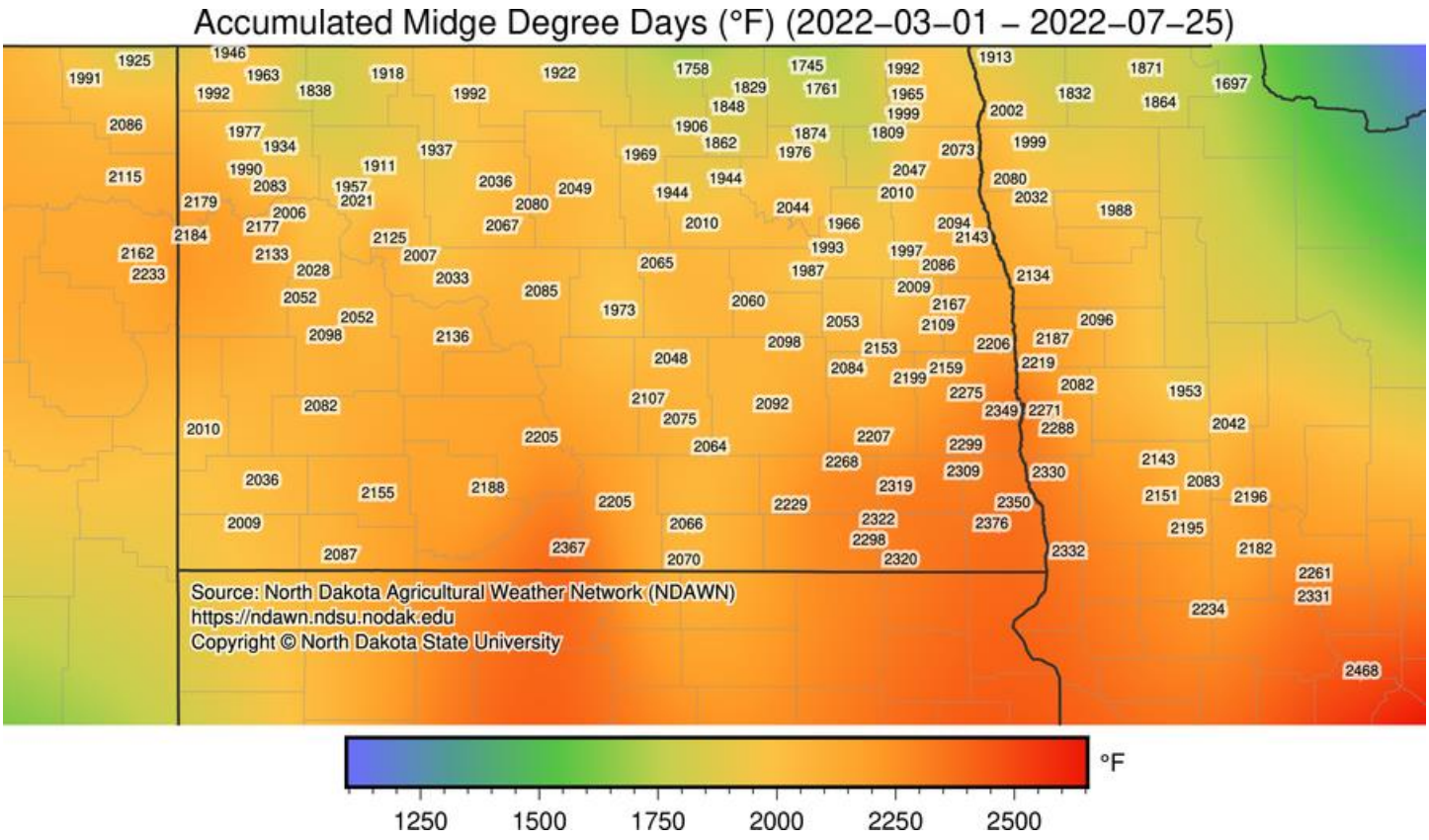
- **Banded sunflower moth** increased with a total of 371 moths captured (31-125 moths captured per site) at 6 of the 8 sites. See map on right.
- **Arthuri sunflower moth** was captured 5 trap sites and trap catches ranged from 1-8 moths per trap per week.
- **Sunflower head moth** was only captured at Cavalier County last week, with one moth per trap per week.

Banded Sunflower Moth Trapping Network
Cochylis hospes



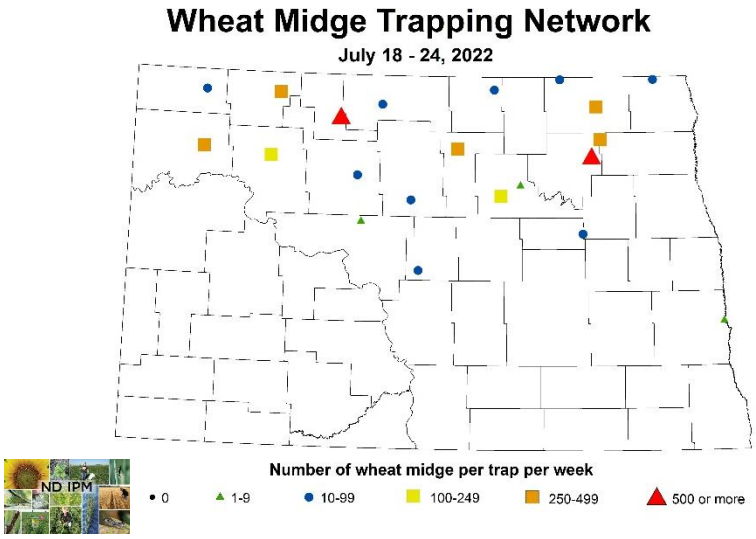
WHEAT MIDGE DECLINES

Observations in northern North Dakota indicate that wheat midge degree days (DD) are between 1750 to 2000 ADD in northern ND, which correlates to the end of the adult flight activity (see map below).



Wheat midge trapping also indicates a decline with only two trap sites with high trap catches in Renville and Ramsey Counties this past week. Most of the wheat fields have matured past the susceptible stage, after mid- to late flowering.

For information on wheat midge scouting and thresholds, see the *Crop & Pest Report* #11, July 14. Also, see recent trapping map results on the PestWeb website, Montana State University.



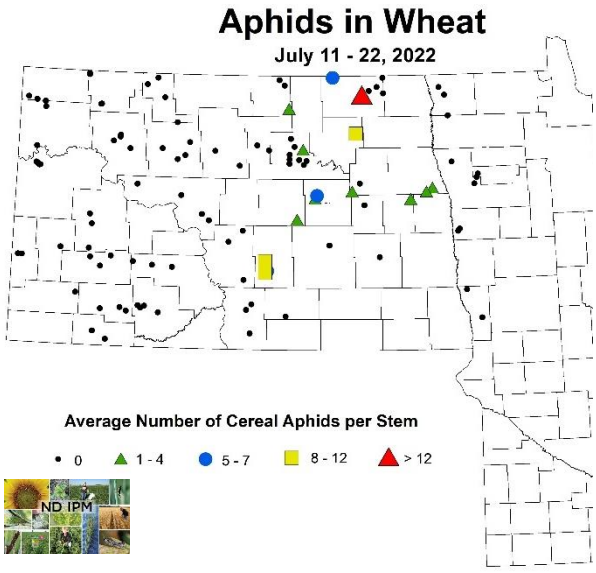
APHID UPDATE

Cereal aphid numbers increased slightly this last week and were economic in 4% of the 50 wheat fields scouted by the IPM Crop Scouts, mainly in northeast and central areas of ND.

Continue to scouting wheat fields from stem elongation and continue up to the early dough stage of wheat. Wheat crop stages ranged from flag leaf extending to kernel watery ripe.

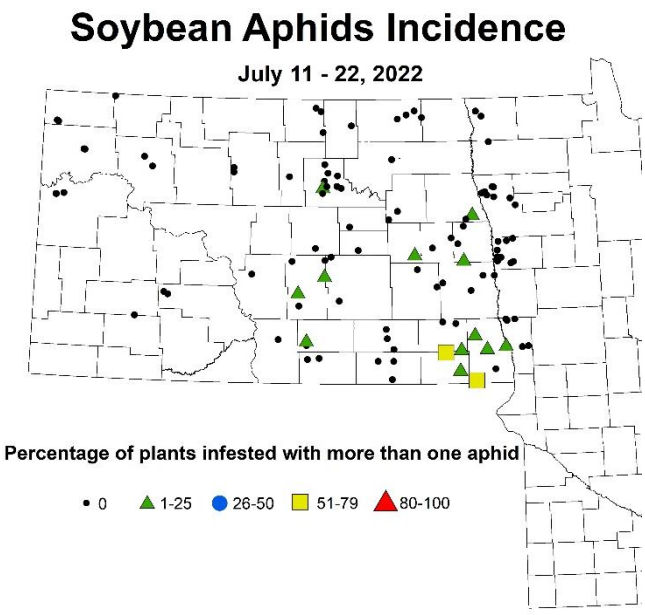
Economic Thresholds for Cereal Aphids in Wheat, Barley or Oats

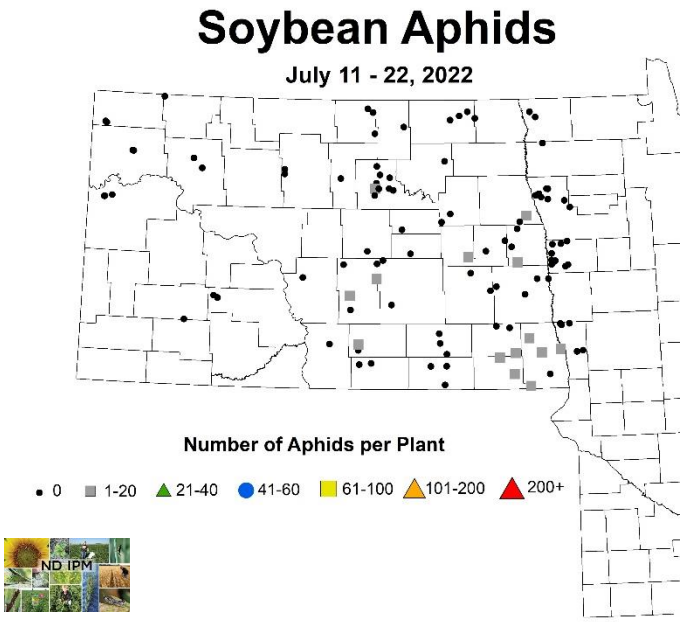
- vegetative through head emergence - 4 aphids per stem
- complete heading through the end of anthesis - 4-7 aphids per stem
- end of anthesis through medium milk - 8-12 aphids per stem
- medium milk through early dough - >12 aphids per stem



Soybean aphid numbers continue to be low and were detected in 17% of the 59 soybean fields scouted by the IPM Crop Scouts. Incidence of plants infested by soybean aphids ranged from 2% to 60% and the average number of aphids per plant was less than 10 aphids per plant. Most aphid positive soybean fields were present in southeastern and central areas of ND. Soybean crop stages ranged from R1 (beginning bloom) to R2 (full bloom).

If soybean aphids reach economic threshold levels of 250 aphids per plant on 80% of the plants, avoid using pyrethroid insecticides, Group 3A, in areas where pyrethroid-resistant soybean aphids occur, areas including *Cavalier, Pembina, Walsh, Nelson, Grand Forks, Steele, Traill, Barnes and Cass Counties*.





Janet J. Knodel
Extension Entomologist

EUROPEAN CORN BORER TRAPPING UPDATE

This week, European corn borer (ECB) Z-race moths (univoltine) were detected at Casselton (Cass County), Cooperstown (Griggs County), Finley (Steele County), Luverne (Steele County), Shenford, and Sheldon (Ransom County) (see Table 1). The higher counts of the Z-race moths for this week were at corn fields near Shenford and Sheldon. In the other fields, ECB Z-race moth counts were few or zero. No ECB E-race moth (bivoltine) was found at any monitored corn fields, except at Minot (Ward County). Corn crop stages were VT (Tassel) to R2 (blister).

Table 1. 2022 pheromone trap catches for European corn borer (ECB) moths in corn, ND (last 4 weeks only)

Area	County	Nearest town	ECB Z-race moths					ECB E-race moths				
			June 29-July 5	July 6-12	July 13-19	July 20-26	Total trap	June 29-July 5	July 6-12	July 13-19	July 20-26	Total trap
EC	Barnes	Cuba	0	0	0	0	0	0	0	0	0	0
EC	Cass	Casselton	0	1	6	6	13	0	0	0	0	0
EC	Cass	Rush River	1	0	39	….	40	0	0	0	0	0
EC	Cass	Grandin	0	1	3	0	4	0	0	0	0	0
EC	Griggs	Cooperstown	0	2	2	2	6	0	0	0	0	0
EC	Steele	Finley	4	10	22	3	39	0	0	0	0	0
EC	Steele	Luverne	0	2	1	1	4	0	0	0	0	0
NC	Ward	Minot	0	0	0	0	0	0	0	1	1	2
SE	Sargent	Gwinner	2	4	2	0	8	1	0	0	0	1
SE	Ransom	Shenford	49	15	48	43	155	0	0	0	0	0
SE	Ransom	Sheldon	53	28	28	63	172	0	0	0	0	0
SE	Richland	Lidgerwood	0	0	1	0	1	0	0	0	0	0
SE	Richland	Antelope	4	1	4	0	9	0	0	0	0	0
		Total moths	**113**	**64**	**156**	**118**	**451**	**1**	**0**	**1**	**0**	**3**

Veronica Calles-Torrez
Post-doctoral Scientist

T.J. Prochaska
Extension Crop Protection Specialist
NDSU North Central Research Extension Center

Janet J. Knodel
Extension Entomologist

plant pathology

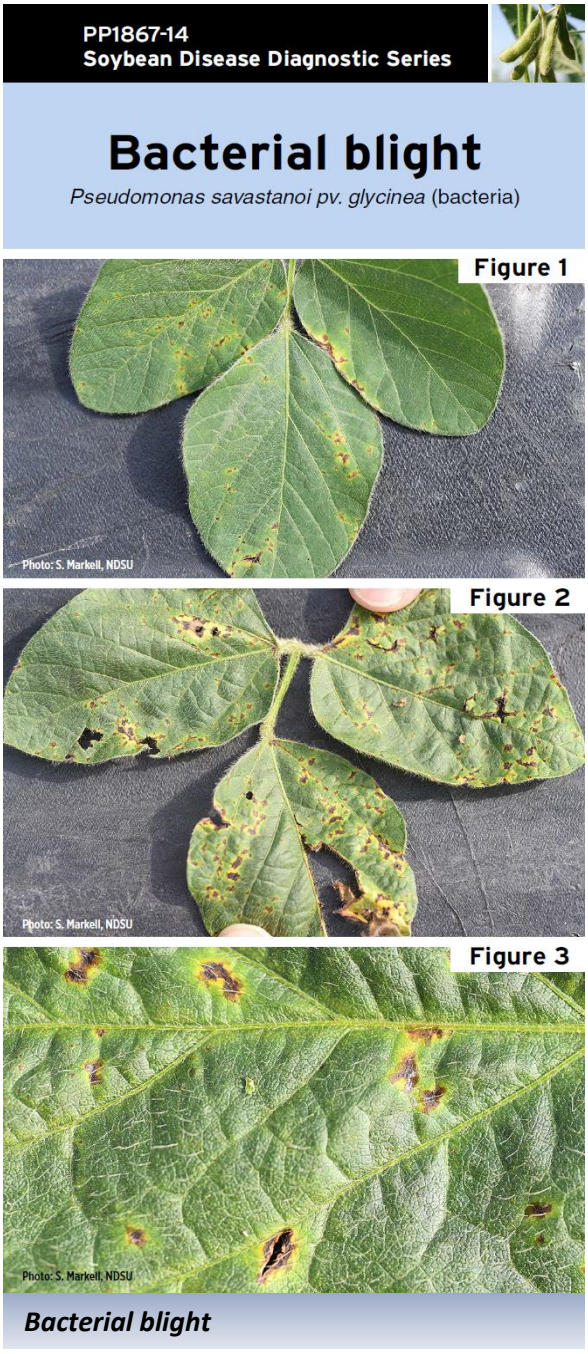
SOYBEAN LEAF DISEASES.

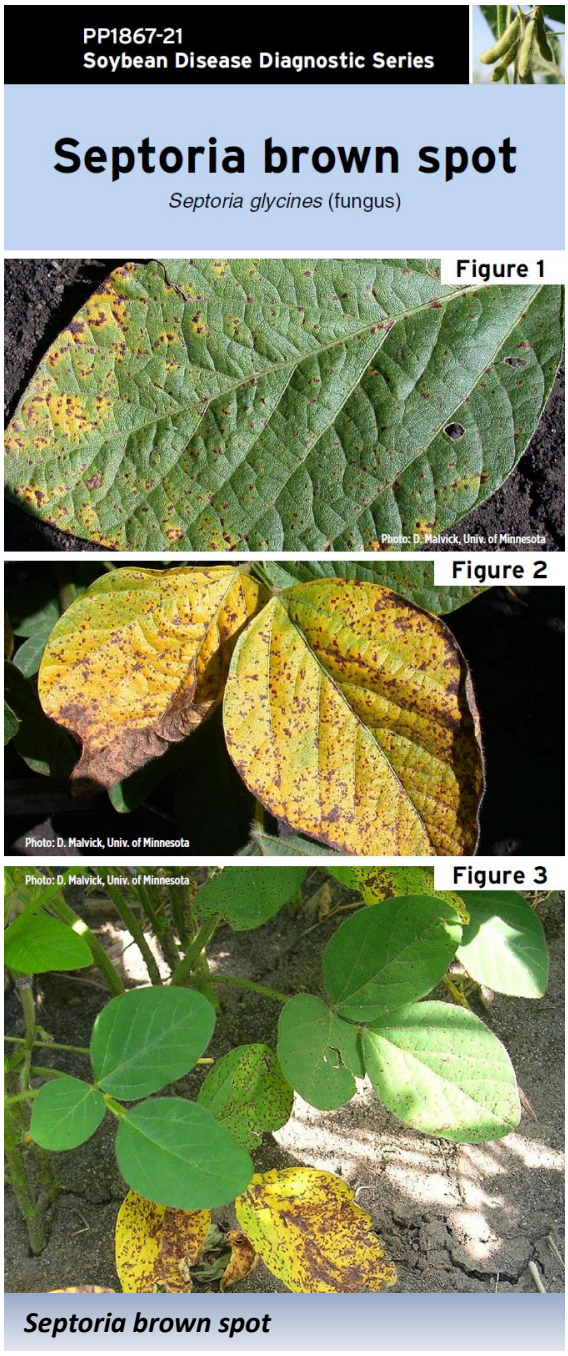
We have been receiving questions on damaged soybean leaves. We are seeing some abiotic damage and herbicide damage, but also, two leaf diseases; Bacterial blight and Septoria brown spot. Fortunately, neither are generally considered economically important. I hope this article will help you distinguish the two common soybean leaf diseases.

The pathogen causing bacterial blight survives primarily on residue. When leaves are damaged by storms and stay wet, bacteria can enter the plant and the infection process begins. Bacterial blight usually appears first as small angular lesions with a bright yellow halo. Sometimes very young lesions may have a water-soaked appearance. The lesions will enlarge or coalesce (grow together), blacken and tear the leaves. The disease is favored by moderate to cool temperatures, frequent storms, and limited (or no) crop rotation.

The pathogen that causes Septoria brown spot also survives primarily on residue. Lesions are first observed in the lower canopy, and begin as small and distinct brown spots. Chlorosis (yellowing) may occur as the disease progresses, however, it may be associated with lesions or occur broadly across the leaf. Lesions will coalesce, resulting in large brown areas on the leaf. The disease is favored by warm temperatures, wet weather, and limited (or no) crop rotation.

The images below are from the NDSU Soybean Disease Diagnostic Series (https://www.ag.ndsu.edu/publications/crops/soybean-disease-diagnostic-series). The resource specifically focuses on soybean diseases that occur in North Dakota and Northern Minnesota and is updated regularly. We thank the North Dakota Soybean Council and the Minnesota Soybean Research and Promotion Council for supporting the development (and updating) of the diagnostic series, and encourage soybean growers to download a copy to help them identify soybean diseases in their fields.





WHITE MOLD: SUMMARY OF RISK FACTORS.

In some areas of the state the risk for white mold has increased. *Depending on growth stage(s) of the crop(s)*, proactive management of white mold could be considered if your risk is high. Below is a summary of ten factors you may consider.

Growth Stages:

- Broadleaf plants become susceptible to white mold only once they begin blooming (sunflowers are an exception). This is because the pathogen needs to utilize the flowers as a food source to cause infection.
- In general, the optimal time to manage white mold with a fungicide application will be somewhere in the early bloom stages of the crop. Applications made in later growth stages miss the critical window to prevent economically important infections.

Weather and Microclimate:

- Soil moisture. Soils must have some water to begin the disease cycle (when sclerotia germinate → produce apothecia → produce ascospores). Historically, only 1-2 inches of rain falling in a 1-2 week period before plants enter bloom is considered the *minimum* needed for sclerotia to germinate, produce apothecia, and release ascospores.
- Temperatures during bloom. Sclerotinia infection and development is optimal when daytime highs are cooler; especially the 60's and 70's. White mold can occur at higher temperatures, but it requires longer periods of leaf wetness.
- Canopy wetness during bloom. White mold is favored if the plants are wet for long periods of time. Rain, fog, and heavy dews during bloom are all favorable for disease.
- Canopy density and canopy closure. These factors make a BIG difference on the environment in the field, and, we learned recently also impact spray timing and droplet size (see article below). Once canopy closure occurs, the crop is likely to have a more favorable microclimate for infection and disease development.

Crop and History:

- Field history. Fields that have a history of white mold are often more likely to experience epidemics. Sclerotia (the pathogens survival structure) can survive for many years in a field, so an epidemic a few years earlier may still be influencing this year's growing season. Consequently, just because we experienced a drought last year doesn't mean we won't have disease.
- Crop rotation. A field with a short rotation among susceptible broadleaf crops is more likely to have white mold problems than a field with no white mold history and/or long crop rotations.
- Crop. All broadleaf crops can get white mold, but we tend to see sunflowers and dry edible beans be among the most sensitive and flax among the least.
- Genetics. While most broadleaf crops do not have 'resistant' varieties, some varieties will be less sensitive than others. In soybeans, the variability in susceptibility is very pronounced, and soybeans with longer maturity groups are generally more susceptible.

WHITE MOLD: SUMMARY OF RESEARCH UPDATES.

In the last several issues of the crop and pest report, Dr. Michael Wunsch at the Carrington Research Extension Center provided excellent updates on how to manage white mold with fungicides in **dry edible bean and soybean**. Below is a brief summary of those findings, and I encourage those considering an application (now or in future years) to revisit the articles in previous issues.

Brief summary of optimal fungicide timing for white mold management on **dry edible bean**.

Percent canopy closure and percent of plants with one or more initial pods are the two most important predictors of optimum fungicide application timing.

- When the canopy was at or near closure (more than 95% of the ground is covered):
  - Fungicide timing was optimal when 10-20% of the plants had initial pin-pods (R2 growth stage).
- When the canopy was not closed (less than 95% of the ground covered):
  - In pinto beans, fungicide timing was optimal when 30-85% of the plants had initial pin-pods.
  - In navy, black and kidney beans, results were similar when applications were made when 10-20% of the plants had pin-pods. More work is ongoing to refine.
- The optimal timing above is the same for a single application, OR, the first application (if you are applying again).

Brief summary of optimal fungicide timing for white mold management in **soybean**.

If conditions are favorable for white mold when soybeans bloom (wet canopy, cool-moderate temps, etc. – see article above):

- If the canopy closes early (R1 or early R2), fungicide application timing is optimized shortly before canopy closure.
- Otherwise (even if the canopy is open), fungicide application timing is optimized by applying as soon as 100% of the plants reach growth stage R2.

Brief summary of droplet size for optimal management of white mold in **soybean**.

Research updates demonstrate the *yield response to fungicide applications can be nearly doubled*, when droplet size (calibrated relative to nozzle manufacturer) and soybean canopy closure are considered. I repeat this statement *'yield response to fungicide applications can be nearly doubled'*.

Two very important concepts have recently been demonstrated in Michael Wunsch's droplet size work. First, as the canopy approaches closure, coarser droplets are needed to penetrate the canopy and deliver the fungicide to the target. Second, droplet size ratings among nozzle manufacturers are not calibrated among one another (i.e., one manufactures 'coarse' may be another's 'very coarse').

Using **TeeJet** extended-range flat-fan nozzles, and when conditions favored white mold and fungicides were applied at R2 (as above) optimal application occurred:

- When average canopy was very open (less than 80% closure), *fine to medium* droplets (assigned by manufacturer) were used.
- When average canopy closure was open (80%-89% closure), *medium* droplets were used.
- When average canopy was at or near closure, *coarse* droplets were used.

Using **Wilger** Combo-Jet flat-fan nozzles, and when conditions favored white mold and fungicides were applied at R2 (as above) optimal application occurred:

- When average canopy was open, *coarse* droplets (assigned by manufacturer) were used.
- When average canopy closure was at or near closure, *very coarse* droplets were used.

Sam Markell
Extension Plant Pathologist, Broad-leaf Crops

CANOLA STRAIGHT CUT OR SWATH

Producers traditionally have swathed rather than straight combined canola. In recent years, the availability of new pod shatter resistant hybrids has made straight cutting the new trend for canola harvest. However, both swathing and straight combining have their places based on the conditions available for harvesting. Timely straight cut can save time and money due to the elimination of the cost of swathing of the crop. Heavier canola stands are better suited for straight combining than thinner stands because of the decreased likelihood of shattering from wind. In the absence of pod shatter tolerance, straight combining has resulted in yield losses of 8 to 54%, as reported by the Canola Production Center in Canada.

Many farmers tend to use desiccants to attain uniform maturity for straight cutting canola. Several preharvest herbicides are labeled for use as a desiccant in canola. Check your labels to verify that products can be used in your situation. Desiccants should be applied when more than 60 to 75% of the seeds have started to turn color (see the herbicide labeled instructions). Research has shown that when the desiccant application is timed properly, crop quality parameters, including yield, oil content, seed loss, green count and grade, generally were similar for desiccated canola compared with swathing.

Fields that are prone to early frost risk and excessive lodging, with uneven maturity and heavily infested with green weeds and diseases (clubroot, blackleg and white mold that reduce the pod integrity), pose severe challenges to straight combining canola. Therefore, swathing may be the better choice for these situations.

Swathed 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 more than 60% color change. 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 hybrid. In hot (90 degrees 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. When examining the plants, consider varying soil types, low-lying areas, available soil moisture and exposed early ripening areas. 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. When seeds in the bottom pods slightly turn color, seeds in the top last-formed pods are filled or nearly filled. Avoid swathing during hot (>86 degrees F) dry and windy weather as the pods and seeds dry out much faster in the swath before chlorophyll clears up in the seed. Swathing during the cool evening hours, at night, or early morning will allow the seed to dry down at a slower rate lowering the chances of green seed in the harvested canola. Swathed canola is ready to harvest, 5 to 14 days after cutting the crop. If there is still green seed in the pods, allow a few extra days in the swath for more color change. Green seed color is fixed once the crop is combined and put into storage.

Anitha Chirumamilla
Extension Cropping Systems Specialist

Hans Kandel
Extension Agronomist Broadleaf Crops

CORN AND SMALL GRAIN CROP PROGRESS

I had the opportunity to see how crops are progressing while driving around eastern ND and western MN the past week. Most corn is now tasseling or silking with a few fields still vegetative. But the number of fields without tassels is getting smaller every day as corn enters its reproductive phases. The first winter wheat was harvested at the Casselton Agronomy Seed Farm on Monday July 25th and I've heard reports of others gearing up to harvest winter cereals later this week and next. Spring wheat in our trials in Cass County is mostly in the milk phases, although some are starting to

change to early dough. In areas where later planting happened, wheat is finishing flowering and fungicide applications for scab are wrapping up.

I've had a few calls from people wanting to know if the corn is going to make it to maturity this year given the late start to planting. A useful tool you can use to compare your location and hybrids to past years and a prediction for this year is the Corn Growing Degree Day decision support tool from the U2U Useful to Useable project. In this online tool, you can select your location on a map and then generate a graph of GDD accumulation for the current season and compare it to past years and a future projection. Select your planting date and corn relative maturity from the drop down menus to generate your graph. Below is a table generated using the GDD decision support tool with a planting date of May 18 for three locations in North Dakota and two relative maturities in each place. For the Cass County location, the 85 day hybrid is likely to reach black layer well ahead of the first projected freeze. The 90 day hybrid also has a good chance of reaching black layer before the first freeze but cuts it much closer to dates of past first freezes. A 95-day hybrid in Cass County just barely squeaks in before the average first frost date and is therefore at a higher risk of not making it to black layer, according to this model.

Location	Corn RM	Corn GDDs as of 7/25/2022	GDDs needed for Black Layer	Projected date of Black Layer
Grand Forks County	80 d	1162	1917	Sept 10
	85 d		2038	Sept 22
Cass County	85 d	1244	2038	Sept 9
	90 d		2159	Sept 19
Richland County	90 d	1306	2159	Sept 11
	95 d		2280	Sept 22

Clair Keene
Extension Agronomist Small Grains and Corn

AROUND THE STATE

NORTH CENTRAL ND

Pockets of severe weather impacted parts of the north central region early this week bringing rain, hail, wind, and even a tornado warning for areas northeast of Minot. At the NCREC, 0.88" of rain was observed since last Monday (July 18th). The following are precipitation observations across the area as noted by local NDAWN stations from July 18th through July 25th: Bottineau: 2.11"; Garrison: 0.01"; Karlsruhe: 0.45"; Mohall: 1.79"; Plaza: 0.00"; and Rugby: 0.26". Bare soil temperatures of 75°F were observed on the morning of July 25th.

Grasshopper calls continue to be the norm across the north central region. Continue to follow IPM scouting protocols to aid you in your decision-making process if control should be needed. Many area growers, additionally, are still applying fungicides to area crops due to "popcorn" showers and dew on many crops during the morning hours.

Fungicide applications for scab continue in the area. Those with winter wheat are expected to start harvest in a couple of weeks. Corn in the area is generally in stages from V8 to VT. Soybeans are found with stages V8-R1. Spring wheat is at flag leaf stage to flowering. Canola is at flowering to start of ripening. Flax is from flowering to ripening stages.

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NORTHEAST ND

The rainfall in the NE area ranged from 0.33 to 1.63 inches in the last week. While many counties have received decent moisture, crops in certain counties are still going through moisture stress. The crop that is most affected is wheat in sandier and high ground areas. Strong storms over the weekend caused more damage to trees and buildings, and also some lodging in barley, wheat, sunflower and corn in the northeastern counties. Many fields have started to make a recovery and stand back up. Green snap was also present in some corn fields (**Figure 1**).

Figure 1: Green Snap in corn in Grand Forks County (Katelyn Landeis, ANR Extension Agent, Grand Forks County)

Most of the small grains are in good to excellent condition and range from anthesis to early dough stage, with most at early milk stage. Not much foliar disease has been reported, except for bacterial leaf streak occurring in a few fields (**Figure 2**). Fusarium head blight (scab) is showing up in some early planted barley fields. With the risk of scab being higher in the NE region, fungicide applications are common. Cereal aphids are increasing in wheat and barley fields.

Figure 2: Bacterial Leaf Streak in wheat (Jeff Stachler, ANR Extension Agent, Griggs County)

Weeds are becoming a concern in wheat fields, especially wild oats in Cavalier **(Figure 3)** and barnyard, stink grass (**Figure 4**) and fox tail barley in Griggs Counties.

Some early planted wheat, oats and barley are starting to turn color on sandier soils (**Figure 5**).

Corn is good to excellent, with fields at V11 to R1, with most of them starting to tassel.

Soybeans are looking short in many areas and are at V4 to R2. Reports of soybean aphids are scattered and no reports of fields reaching thresholds yet. Dicamba drift situations in soybeans have been reported in several counties (**Figure 6**).

Dry beans are between 3 trifoliate to 4" pods with seeds starting to show. Peas are at filling stage and some reaching the physiological maturity.

Figure 3: Wheat field infested with wild oats in Cavalier County (Anitha Chirumamilla, LREC)

Canola is flowering to near-finished flowering in most of the acres, with fungicide being applied last week. The second cutting of alfalfa is in progress.

On August 3rd, Grand Forks County is conducting their Variety Trial Plot Tour near Nelson Farms at 5:00 PM. For more information on the tour, contact Katelyn Landeis at katelyn.landeis@ndsu.edu.

Figure 4: Wheat field infested with stink grass in Griggs County (Jeff Stachler, ANR Extension Agent, Griggs County)

Figure 5: Wheat field turning color in Griggs County (Jeff Stachler, ANR Extension Agent, Griggs County)

Figure 6: Dicamba drift injury on soybeans in Grand Forks County (Anitha Chirumamilla, LREC)

Anitha Chirumamilla
Extension Cropping Systems Specialist
Langdon Research Extension Center

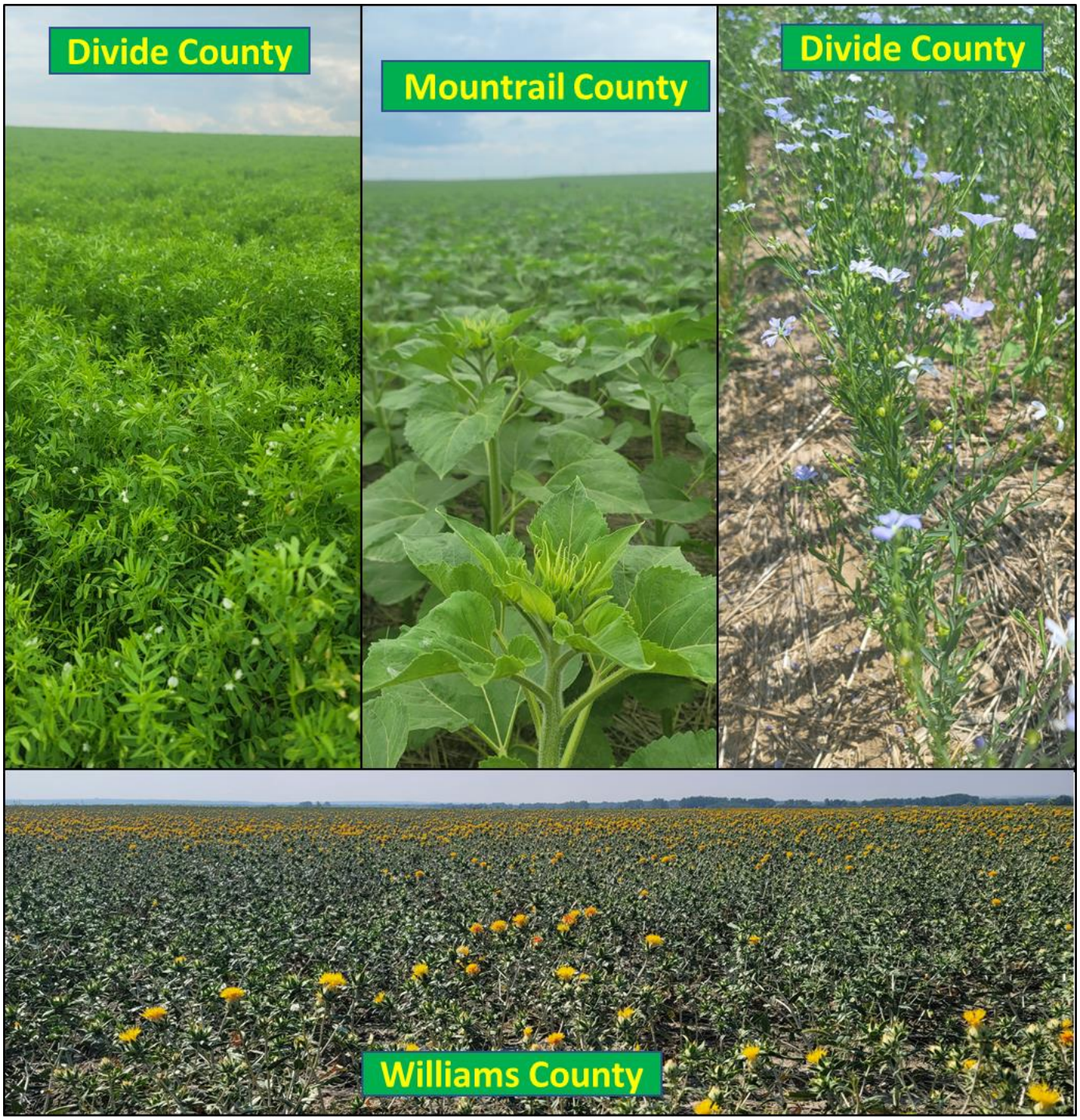
NORTHWEST ND

A little over a week ago, a storm hit the northwest region, particularly in Williams County, which brought down hail as big as tennis balls. Although patchy, the hail did damage a few crop acres near Wildrose. The storm and scattered rains during the past two weeks brought some moisture to the northwestern counties. Averaged across NDAWN weather stations from each county, Divide and Williams counties received a total rainfall of 0.83" and 0.60", respectively, between July 11th through July 25th. Within the same time period, McKenzie County only received an average of 0.02", and Mountrail County received an average of 0.3". Average maximum temperatures in Divide, McKenzie, Mountrail, and Williams counties were 81, 86, 83, and 84°F, and average minimum temperatures were 57, 60, 58, and 58°F, respectively, in the same time frame.

For the most part, crops are growing well in this corner of the state. Harvesting of winter wheat has started in some areas. Most canola fields are past peak bloom with some at the end of flowering with lower pods starting to fill. Most of the spring small grains have heads fully emerged. Most of the corn is at full tassel, although in some areas, tassels are just starting to come out. Sunflowers are mostly at the R2 stage. Soybeans are in V6 to R3 stages but mostly are in the R2, and lentils are at R1 to R4 stages. Most field peas are approaching physiological maturity and, in some fields, fully yellow. Flax fields are at full to late flowering, sugar beet at 14 to 16-leaf, and safflower on track to full bloom.

Kochia has been by far the weed that stands out in crop and in fallow situations, and grasshoppers are everywhere.

(Continue for photos from Divide, Mountrail, and Williams Counties)



Charlemagne “Charlie” Lim
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

According to NDAWN, the region's rainfall during April 1-July 25 ranged from 9.3 inches (Linton; Emmons County) to 17.4 inches (McHenry; Eddy County), with the Carrington REC receiving 14.3 inches and Oakes irrigation research site at 16.6 inches. The region received 0.5 inch (Marion; LaMoure County) to 3 inches (Zeeland; McIntosh County) during July 1-25. Hail damage recently occurred, including in Emmons, Kidder, Logan, and McIntosh counties. Average daily water use by corn and soybean plants that emerged in late May ranged from 0.2-0.25 inch during the past week at the Carrington REC. Crop moisture stress symptoms are displayed in low quality soil areas of fields primarily west of Hwy 281. Current (July 25) accumulated growing degree days for May 15 planted corn ranges from -114 units (Denhoff; Sheridan County) to +156 units (Pillsbury; Barnes County) when compared to the long-term average for the period.

Winter cereals are mature and harvest has commenced. Spring-seeded small grain growth stages generally range from flowering to dough stage (Figure 1). The majority of May-planted corn is in the tassel to silk (VT-R1) stages. The majority of soybean are in the full flower to early pod development (R2-3) stages and dry bean are in the bud to pod-development (Vn-R4) stages (Figure 2).

Figure 1. Barley varieties at CREC near physiological maturity.

Figure 2. Dry bean in the pin-pod (R2) stage.

The Carrington REC has received requests for information on row crop response to plant health fungicides applied following hail injury. Data is available for soybean and dry bean, and available on request.

<u>Upcoming Carrington REC crop tours</u>:
*Tri-county (Wishek) - August 1, 7 p.m.
*Oakes Irrigation Research Site - August 4, 8:30 a.m.
*Corn (Fingal) - August 31, 8 a.m.
*Row Crop (CREC) - September 1.

Greg Endres
Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center

SOUTHWEST ND

Crop conditions overall look excellent other than for those fields which have been hit by extreme weather. Grasshoppers continue to be highly prevalent and red sunflower seed weevil is beginning to be seen. Most sunflowers in the region are in the R2 to late R4 stage, however I've seen a couple fields in the early R5. Harvest of most winter wheat, barley, and pea fields will begin within the week, and harvest of spring wheat that was planted before the spring snowstorm is close behind. The variability from a wide range of planting dates is really showing now. Canola is anywhere from budding to ripening.

Low pH Hard Red Spring Wheat and Durum trial north of Scranton, ND. This trial is observing differences in cultivar and fertilizer treatments in acid soils.

Ryan Buetow
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weather

WEATHER FORECAST

The July 28 to August 3, 2022 Weather Summary and Outlook

Most of the rain that fell over the past week occurred across north central and northeastern North Dakota into northwestern Minnesota (Figure 1). There were a number of small disturbances that tended to produce little rain with that exception across the northern part of the region. This upcoming period looks to be similar, with more hit and miss threats of thunderstorms from a few disturbances that will pass through the northern plains, meaning widely variable rain amounts across the area once again.

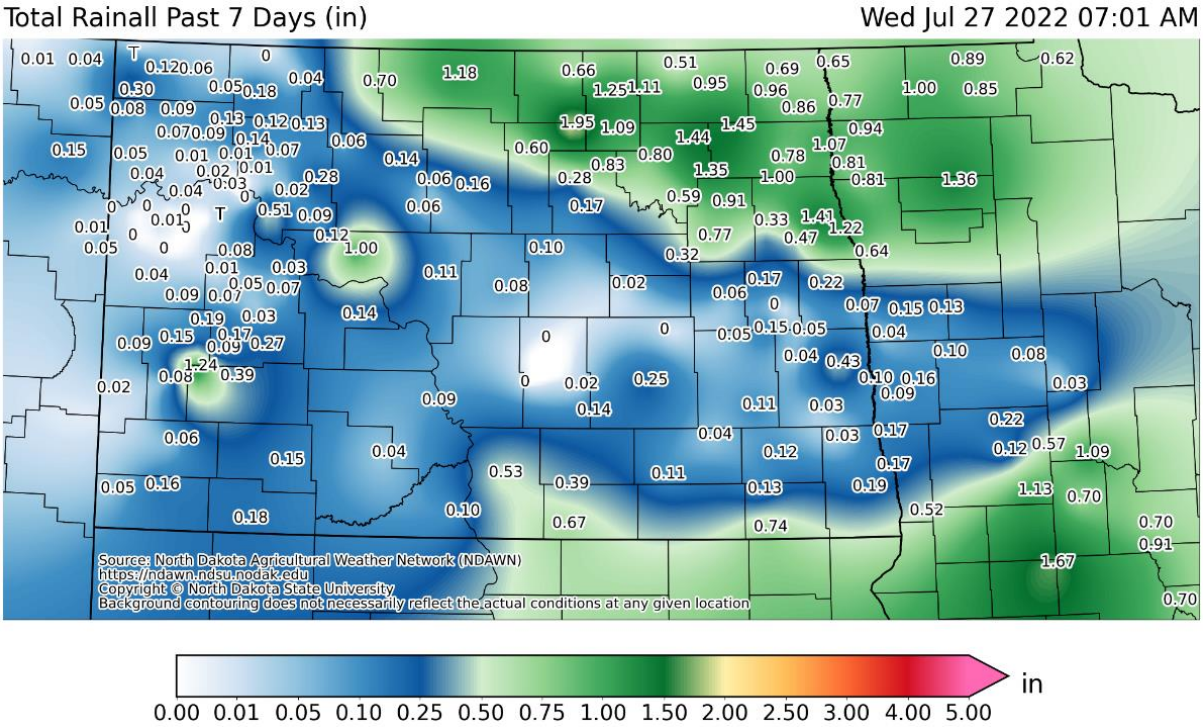

Figure 1. Total rainfall for the 168-hour period ending at 7:00 AM on July 27, 2022 at NDAWN stations

This past week was noticably cooler than it was duriing the past several weeks (Figure 2). These next 7 days should start off on the cool side but warm up quickly. Starting this weekend and perhaps lasting into all of next week will be a period of above to even well above average temperatures. This would mean far more evaporation potential than rainfall for most locations. This will probably mean heat stress concerns for crops, especially in areas with minimal rainfall in the past several weeks.

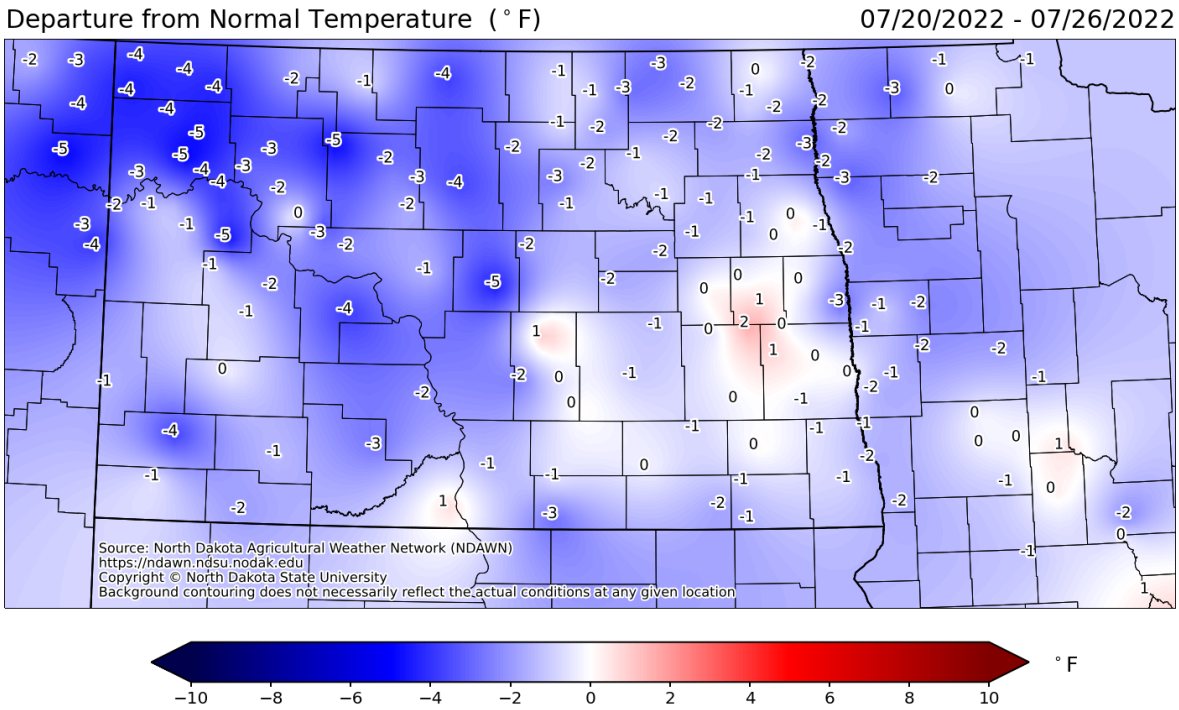

Figure 2. Departure from Normal Temperature at NDAWN Stations for the Period of July 20 through July 26, 2022

Figures 3 and 4 below are forecasted Growing Degree Days (GDDs) base 32° (wheat and small grains) and 50° (corn and soybeans) for this forecast period.

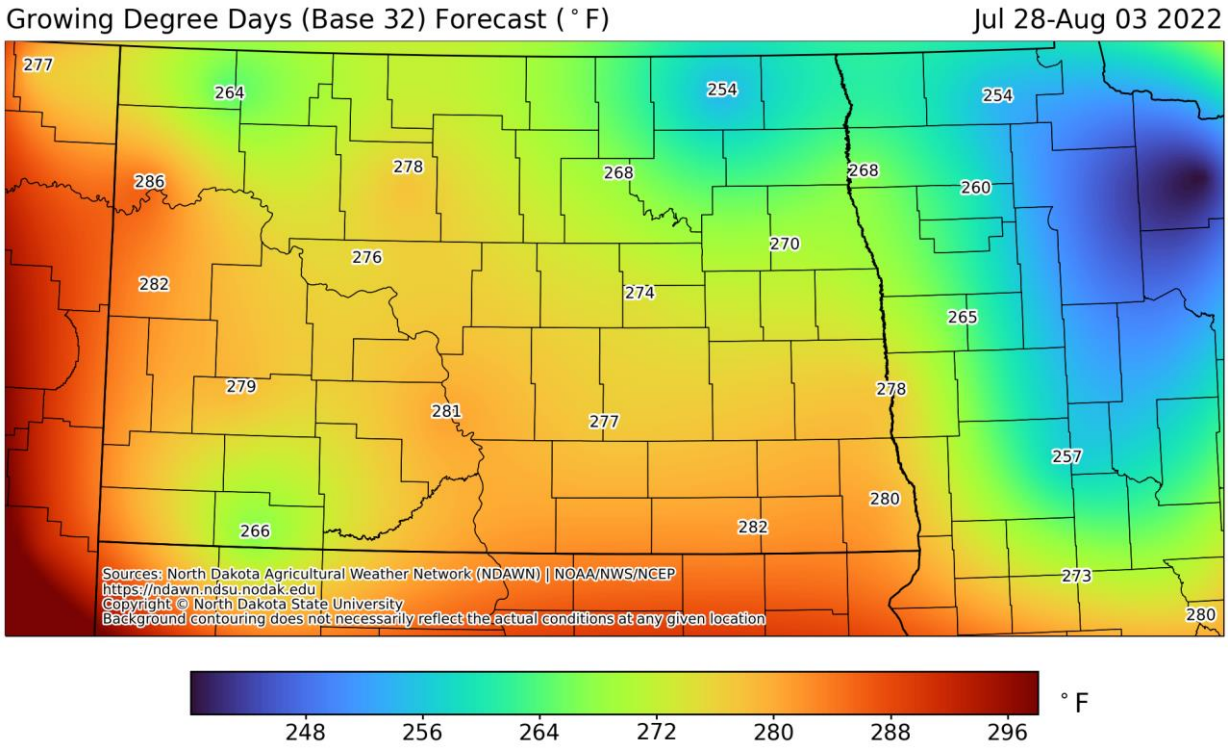

Figure 3. Estimated growing degree days base 32° for the period of July 28 to August 3, 2022.

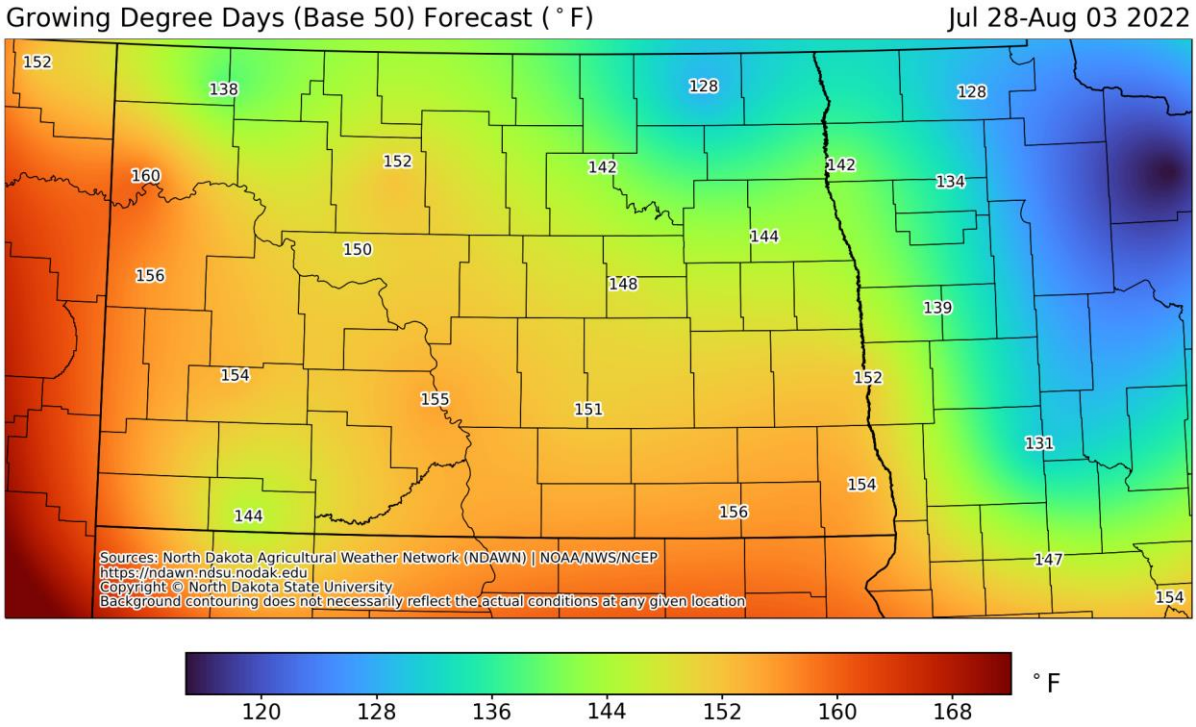

Figure 4. Estimated growing degree days base 50° for the period of July 28 to August 3, 2022.

Using May 15 as a planting date, the accumulated growing degree days for wheat (base temperature 32°) are given for NDAWN sites in Figure 5. You can calculate wheat growing degree days based on your exact planting date(s) here: https://ndawn.ndsu.nodak.edu/wheat-growing-degree-days.html

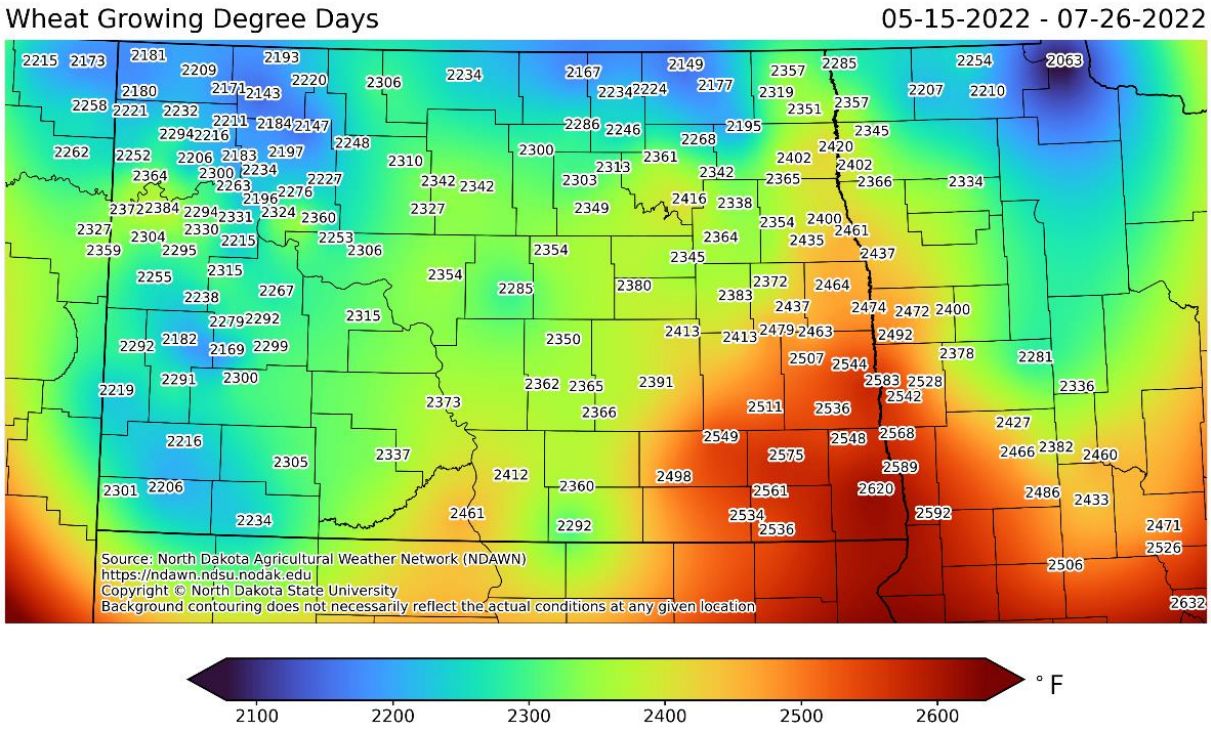

Figure 5. Wheat Growing Degree Days (Base 32°) for the period of May 15 through July 26, 2022.

Using May 20 as a planting date, the accumulated growing degree days for corn (base temperature 50°) are given for NDAWN sites in Figure 6. You can calculate corn growing degree days based on your exact planting date(s) here: https://ndawn.ndsu.nodak.edu/corn-growing-degree-days.html.

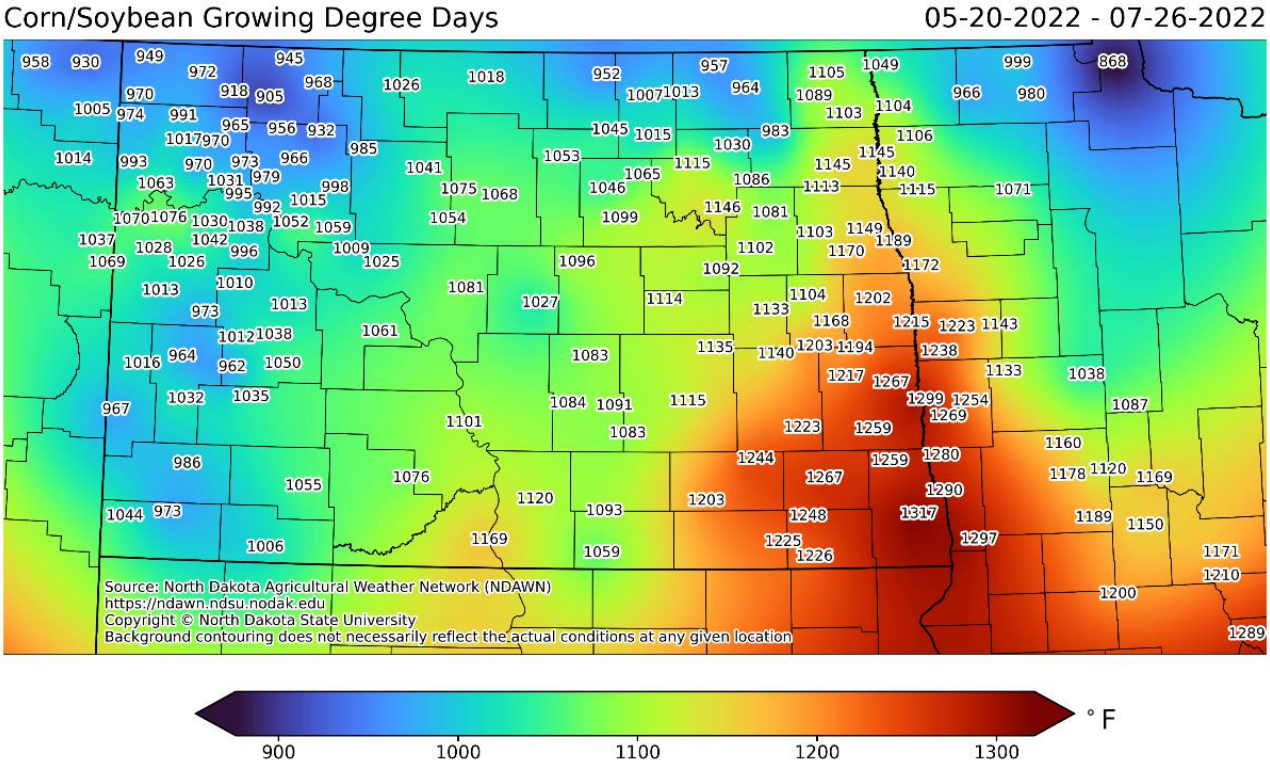

Figure 6. Corn Growing Degree Days (Base 50°) for the period of May 20 through July 26, 2022.

Soybeans also use base 50° like corn, but NDAWN has a special tool for soybeans that, based on your planting date and cultivar, can estimate maturity dates based on average temperatures, as well as give you GDDs based on the planting date(s) you set. That tool can be found here: https://ndawn.ndsu.nodak.edu/soybean-growing-degree-days.html

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