North Dakota State University
CROP & PEST REPORT
NDSU EXTENSION

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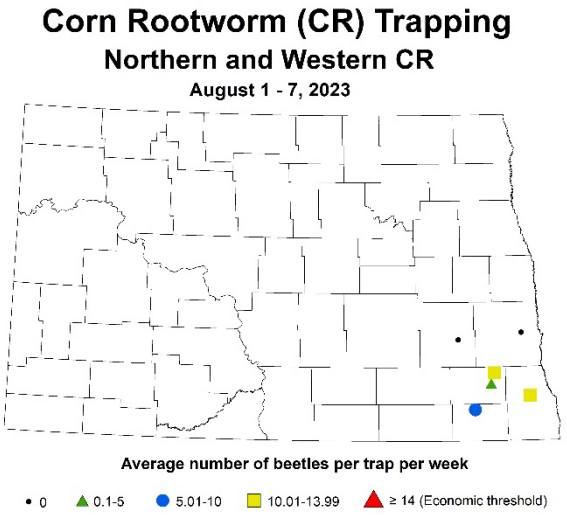
entomology

CORN ROOTWORM BEETLES TRAP UPDATE

The trap catches for corn rootworm beetles increased during August 1-7 (Table 1). The proportion of type of corn rootworms captured switched, from 78% last week to 23% this week for western corn rootworm, and from 22% last week to 77% this week for northern corn rootworm. So, northern corn rootworm is the dominant beetle in corn fields this past week. Corn stages range from R2 (blister with clear liquid kernels) to R3 (milk – kernels filled with "milky" fluid).



The economic threshold (E.T.) for yellow sticky cards is >14 beetles per trap per week. If you are above the E.T., this indicates that a high corn rootworm population is expected the following year in that field, and a corn rootworm management tool will likely be needed in that field to protect the corn crop next spring.

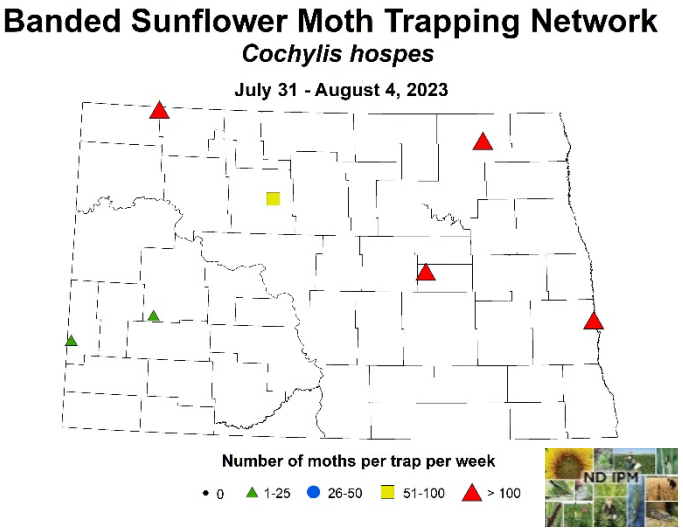
Table 1. Adult corn rootworms (northern and western corn rootworms) per 4 traps per week in ND field corn, 2023

Area	County	Nearest town	July 17-24	July 25-31	Aug 1-7	Total
SE	Cass	Mapleton	0	0	0	**0**
SE	Barnes	Cuba	0	0	0	**0**
SE	Ransom	Sheldon	0	7	11	**18**
SE	Ransom	Shenford	0	0	2	**2**
SE	Sargent	Gwinner	0	1	10	**11**
SE	Richland	Mooreton	0	1	12	**13**
		Total corn rootworm =	**0**	**9**	**35**	**44**
		Percentage of NCR =	**0%**	**22%**	**77%**	**66%**
		Percentage of WCR =	**0%**	**78%**	**23%**	**34%**

Economic thresholds (ET) is 14 or more adults (individually or in combination) per sticky trap per week

SUNFLOWER INSECT TRAP UPDATE

- ✓ **Banded sunflower moth trap counts** were similar to the last two weeks total count at 656 and 697 moths to 723 moths total this week, and they were present at all trapping sites both weeks.
- ✓ **Arthuri sunflower moths** increased from 86 and 65 moths total last week to 198 moths total this week, and were present at all trapping sites again this week.
- ✓ Only three **sunflower head moths** were trapped in Ward County.
- ✓ Crop stages at sunflower fields ranged from R4 (bud open ray flower visible) to R5.5 (50% of florets flowering) for last week.



Continue to scout sunflowers from R4 (bud open ray flower visible) through R5.7 (70% of florets flowering on face of sunflower head) for banded sunflower moth, Arthuri sunflower moth, and red sunflower seed weevil. **The Economic thresholds (E.T.) for banded sunflower moth / Arthuri sunflower moth is one moth per 100 plants for daytime scouting. For sunflower moth, E.T. is 1-2 moths per 5 plants for field scouting and an average of 28 moths per trap per day (or 4 moth per trap per day) for the pheromone trap.**

SCOUT FOR FLEA BEETLES FEEDING ON CANOLA PODS

The summer population of flea beetles is emerging, so now is a good time to check your canola fields for any pod feeding. Moderate pod feeding was reported on the field edges in a canola field near Langdon, northeast North Dakota. Based on research conducted at Agriculture and Agri-Food Canada in Saskatoon, Canada found that late summer feeding on canola pods by flea beetles is rarely economical. "Flea beetle feeding that occurs when seeds in lower pods of canola are at the green stage or beyond is unlikely to affect seed yields regardless of the infestation rate of flea beetles. **Even when seeds are translucent to green, numbers higher than 100 flea beetles per plant, and for some cultivars higher than 350 per plant, may be necessary to cause significant yield reductions**." (Source: J. Gavloski, Manitoba Crop Pest Update #13, August 14, 2019)

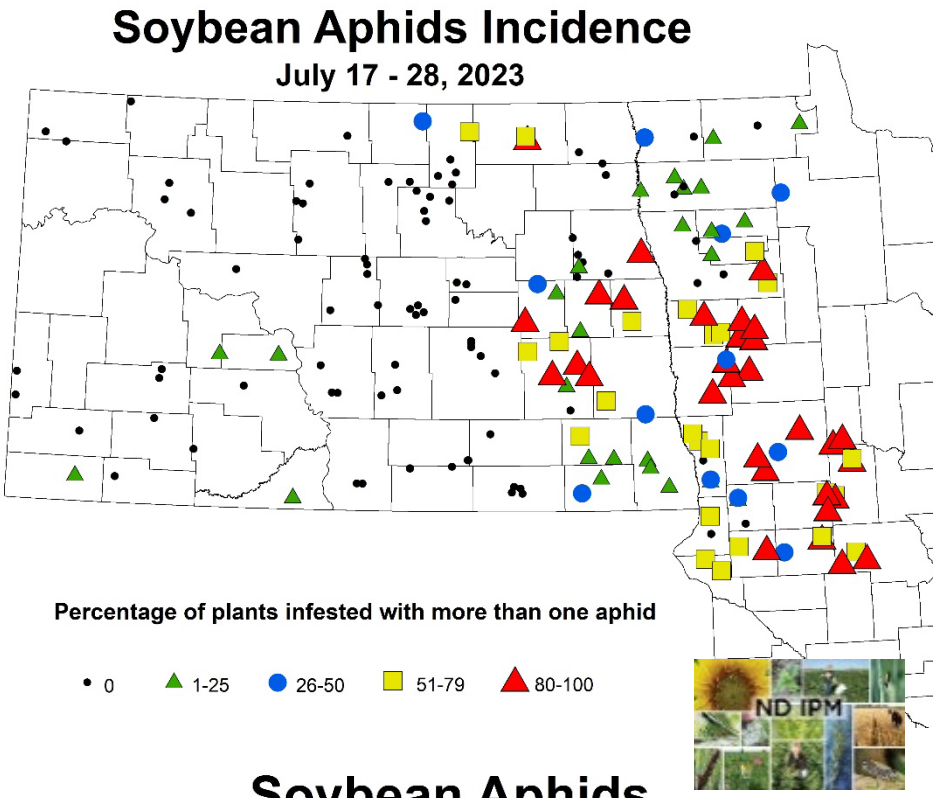
Flea beetles feeding on canola pods. (J. Knodel, NDSU)

Flea beetle feeding injury on pods is usually most significant on late-planted canola and on the upper pods. Fortunately, the lower pods of canola are the primary pods that provide most of the canola yield. However, flea beetle feeding injury on pods can result in poor seed fill, premature pod drying, or pod shattering. If the canola is mature, past the 5.2 growth stages (when seeds in lower pods have turned translucent to green), then yield will be less impacted by flea beetle feeding. In a flea beetle trapping study of freshly swathed canola, the number of flea beetles per trap decreased dramatically after 7-days of drying in swaths. Flea beetles are mobile insects and fly around to find 'greener' canola fields (late-planted) or other cruciferous host plants like backyard garden vegetables or flowers for summer feeding.

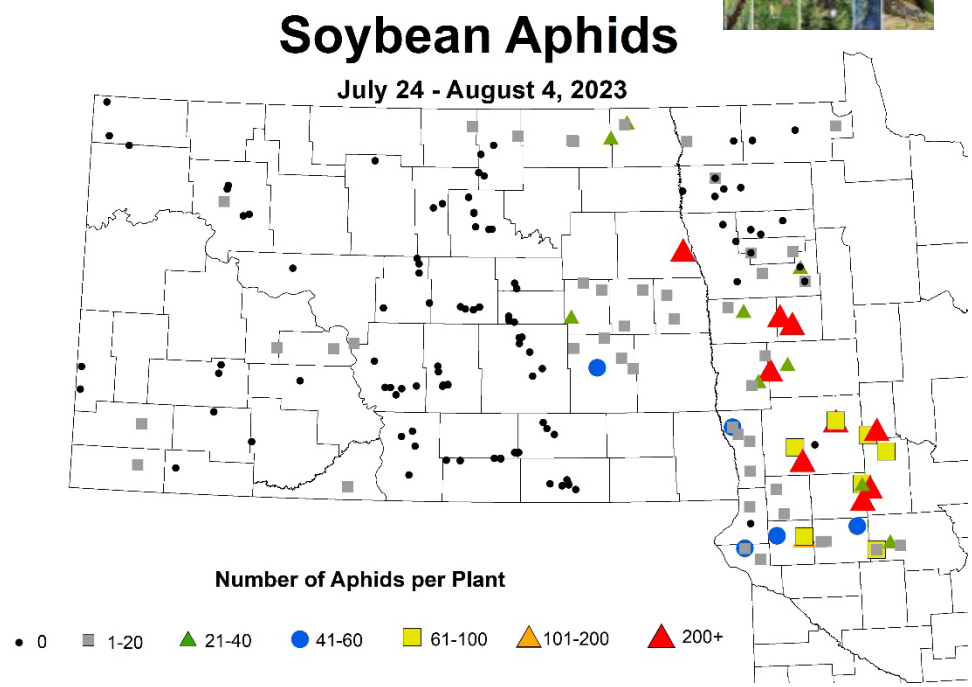
Insecticides registered for flea beetle control with a short, 7-day Pre-Harvest Interval (PHI) include: Delta Gold (deltamethrin), Warrior II and generics (lambda-cyhalothrin) and Mustang Maxx (zeta-cypermethrin).

SCOUT FOR ALL SOYBEAN INSECT PESTS

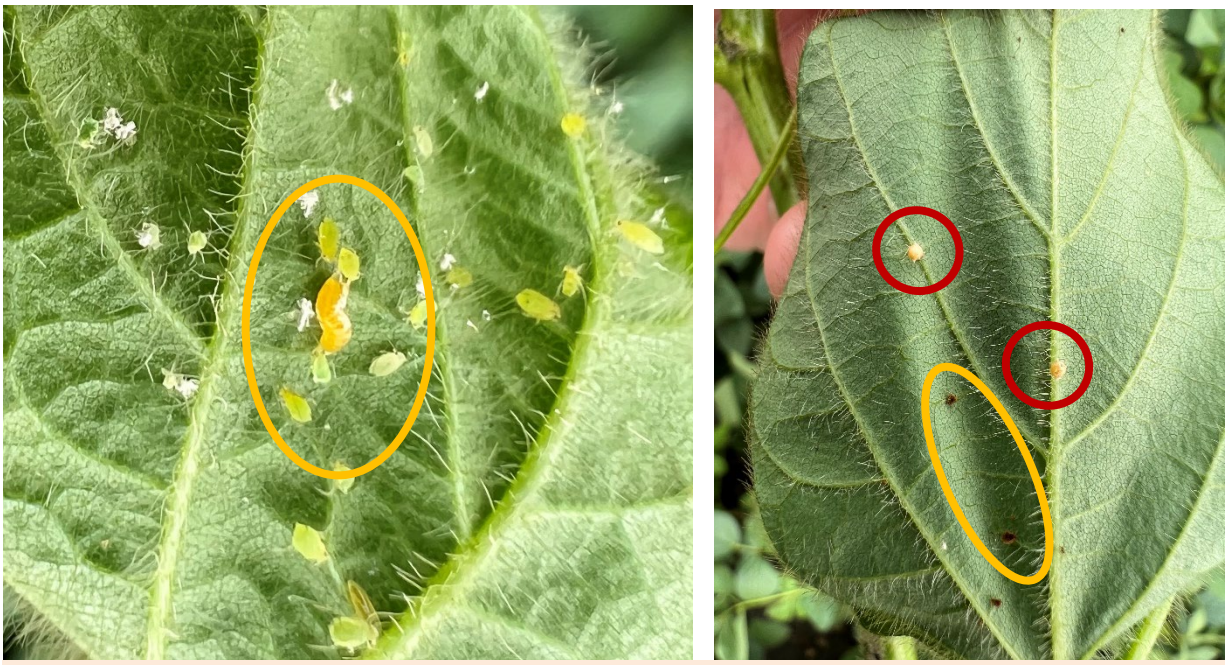
Soybean aphids continue to expand in eastern counties of North Dakota. Incidence of soybean aphids varies widely from 0-100% and numbers of aphids per plant (0-300 aphids per plant) in about <40% of fields scouted. In Minnesota, higher incidence (0-100%) and numbers of aphids per plant (0-950 aphids per plant) are being recorded in 79% of fields scouted. Please continue to send me your field reports for soybean aphid counts and locations.



The **critical growth stages** for making most soybean aphid treatment decisions in North Dakota is from the late vegetative to early reproductive stages (R3 – beginning pod). Crop stages range from R2 (full bloom) to R6 (full seed).



Continue to scout for all soybean insect pests. Other insect pests being observed at non-economic levels (for the most part) in soybean fields include: **foliage-feeding caterpillars (green cloverworm, thistle caterpillar, loopers), grasshoppers and bean leaf beetles**. **Spider mites are generally hard to find and mainly just in field margins in North Dakota soybean fields. If spider mites are present in fields, remember not to flare spider mites (increase their numbers) by avoid spraying pyrethroid insecticides (except for active ingredient bifenthrin does not flare mites).** The recent cooler and wetter forecast and beneficial mites / predators should help keep mites and other insect pests in check, but field scouting is key.



Left: Cecidomyiid aphid midge larva (yellow circle) eating aphids; Right: Blackened, dead aphids from aphid midge (yellow circle) and parasitized aphid mummy (red circles)
Photographs courtesy of Jeff Stachler, Griggs County ANR Extension Agent

Numerous predators and parasitoids (or parasitic wasps) also are being observed in soybean fields. One interesting predator that was found this past week is the **Cecidomyiid aphid midge larvae,** which feeds on aphids, other soft-bodied insects, and insect eggs. It is small (2-3 mm), legless and often orange. The midge larva has a strong siphoning jaw for paralyzing each aphid and sucking out its internal guts until dry, leaving a blackened, dead aphid attached to the leaf. Each larva consumes about 80 aphids during its development. Aphid midge larvae are most common from mid- to late summer.

DIAMONDBACK MOTH LARVAE FEEDING ON CANOLA PODS

Economic Threshold

Early flowering:
10 to 15 larvae per square foot

Pod stage:
20 to 30 larvae per square foot

Fields with some pod feeding (see photographs on next page) from mature larvae have been observed near Devils Lake and northeastern areas of North Dakota and northwest Minnesota. This is the second generation of diamondback moths. **Scout for mature larvae (lime green about ½ inch long), which feed on flowers and young pods of late planted canola**. This is when the canola crop is most susceptible to injury – **blooming to early pod development**. Larval feeding during blooming to early pod development can cause delayed plant maturity, uneven crop development and significant yield reduction due to

Left: Diamondback moth larva
Right: Newly formed pupa and pupa with moth ready to emerge (Knodel, NDSU)

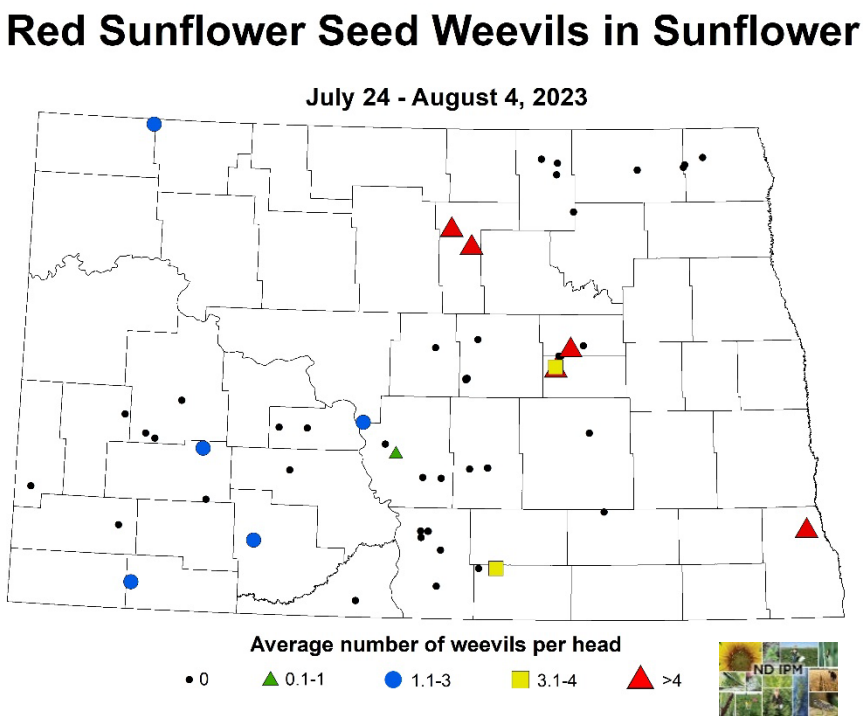
loss of flowers and pods. The next (third) generation usually occurs too late in the season to cause plant injury, except in extremely late-planted canola fields.

Insecticides registered for diamondback moth control include: 1st choice - diamides (Prevathon, Vantacor, Coragen, Exirel); 2nd choice premix (Besiege), and 3rd choice pyrethroids (bifenthrin - Brigade 2EC and generics, Delta Gold, Warrior II and generics and Mustang Maxx).

Diamondback moth larva feeding on mature canola pods
Photographs courtesy of David Grafstrom, University of Minnesota, Roseau, MN

RED SUNFLOWER SEED WEEVIL UPDATE

IPM scouts found red sunflower seed weevils in 25% of the sunflower fields scouted and an average of 5 weevils per head (range of 1-12 weevils per head) last week. The highest counts were in the central area of the state. At the NCREC in Minot, 20-50 weevils per head were observed by my research crew collecting 'live' weevils to conduct our insecticide resistance bioassays on August 8. Weevil populations are increasing, as adult weevils will survive for about one month. Crop stages ranged from R4 (bud open ray flower visible) to R5.9 (90% of the florets flowering) last week.



For the Economic Threshold (E.T.), I was informed that the cost of aerial application has increased to $9-11 per acre depending on how many gallons per acre are applied. Higher gallonage is more expensive because it requires more trips to cover a field. Increased application costs also will increase the E.T. for red sunflower seed weevils.

I re-calculated the E.T. for $10 and $11 application costs. Tables 1 and 2 are the updated tables that should be used for higher application costs (insecticide costs + application cost).

The E.T. formula is also given below if you want to calculate your own threshold. The cost of insecticide treatment includes the cost of insecticide per acre and the cost of insecticide application per acre.

2023 RSSW Threshold Updated

Oilseed sunflower at 23 cents per lb and 22,000 - 18,000 plants per acre

$8 insecticide + $10 application cost per acre – 7 - 8 weevils per head

$9 insecticide + $11 application cost per acre – 8 – 9 weevils per head

Confection sunflowers:

1 weevil per head due to the industry standard for minimal insect damage

$$\text{Threshold (weevils per head)} = \frac{\text{Cost of Insecticide Treatment}}{(\text{Market Price} \times 21.5) \times (0.000022 \times \text{Plant Population} + 0.18)}$$

Table 1. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals $18 per acre ($8.00 for insecticide and $10 for aerial application costs).

Market Price	Sunflower Plants per Acre (x 1,000)									
$ per lb	16	17	18	19	20	21	22	23	24	25
0.18	11.7	11.1	10.5	10.0	9.6	9.1	8.8	8.4	8.1	7.8
0.19	11.1	10.5	10.0	9.5	9.1	8.7	8.3	8.0	7.7	7.4
0.20	10.6	10.1	9.6	9.1	8.7	8.3	8.0	7.6	7.3	7.1
0.21	10.2	9.6	9.1	8.7	8.3	7.9	7.6	7.3	7.0	6.8
0.22	9.8	9.2	8.8	8.3	8.0	7.6	7.3	7.0	6.7	6.5
0.23	9.4	8.9	8.4	8.0	7.6	7.3	7.0	6.7	6.4	6.2
0.24	9.0	8.5	8.1	7.7	7.3	7.0	6.7	6.4	6.2	6.0
0.25	8.7	8.2	7.8	7.4	7.1	6.8	6.5	6.2	6.0	5.7
0.26	8.4	7.9	7.5	7.2	6.8	6.5	6.2	6.0	5.7	5.5
0.27	8.1	7.7	7.3	6.9	6.6	6.3	6.0	5.8	5.5	5.3
0.28	7.8	7.4	7.0	6.7	6.4	6.1	5.8	5.6	5.4	5.2
0.29	7.6	7.2	6.8	6.5	6.2	5.9	5.6	5.4	5.2	5.0

Table 2. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals $20 per acre ($9.00 for insecticide and $11 for aerial application costs).

Market Price	Sunflower Plants per Acre (x 1,000)									
$ per lb	16	17	18	19	20	21	22	23	24	25
0.18	13.0	12.3	11.7	11.1	10.6	10.2	9.7	9.4	9.0	8.7
0.19	12.4	11.7	11.1	10.6	10.1	9.7	9.3	8.9	8.6	8.2
0.20	11.8	11.2	10.6	10.1	9.7	9.2	8.8	8.5	8.2	7.9
0.21	11.3	10.7	10.2	9.7	9.2	8.8	8.5	8.1	7.8	7.5
0.22	10.8	10.3	9.7	9.3	8.8	8.5	8.1	7.8	7.5	7.2
0.23	10.4	9.9	9.4	8.9	8.5	8.1	7.8	7.5	7.2	6.9
0.24	10.0	9.5	9.0	8.6	8.2	7.8	7.5	7.2	6.9	6.6
0.25	9.7	9.1	8.7	8.2	7.9	7.5	7.2	6.9	6.6	6.4
0.26	9.3	8.8	8.4	7.9	7.6	7.2	6.9	6.6	6.4	6.1
0.27	9.0	8.5	8.1	7.7	7.3	7.0	6.7	6.4	6.2	5.9
0.28	8.7	8.2	7.8	7.4	7.1	6.8	6.5	6.2	6.0	5.7
0.29	8.4	8.0	7.5	7.2	6.8	6.5	6.3	6.0	5.8	5.5

Janet J. Knodel
Extension Entomologist

plant pathology

THE MANY COLORS OF FUNGI ON MATURE SMALL GRAIN SPIKES

I have received several texts and emails regarding "mold" that is growing on mature small grains spikes. There are several fungi that can be observed at harvest time and this article will review some of the information pertaining to commonly asked questions.

Sooty Mold

Sooty mold is often described as dark-green to black mold growing on a wheat or barley spike (Figure 1). Mold growth can be observed on the awns, florets, and rachis. The fungi that make up the sooty mold complex are opportunistic, very weak pathogens, and are predominately associated with *Cladosporium* and *Alternaria* species (non-toxin producing). In some cases, sooty mold can lead to black point on wheat kernels.

Figure 1. Barley spike (left) and wheat spikes (right) with sooty mold. Note black fungal growth on most parts of the grain spike (barley photo by James Richter and wheat photo by Kyle Okke).

We tend to see an increase in sooty mold reports during years with either a delayed harvest, heavy cereal aphid pressure, or in fields with premature death of wheat spikes. When a delayed harvest is accompanied by wet and humid conditions, the sooty mold fungi will actively colonize the dead tissue. During years of heavy cereal aphid pressure in small grains (like this year), the aphids excrete "honeydew" and this waste product is an excellent food source for sooty mold due to the high sugar content. Sooty mold associated with cereal aphids will be observed on areas of plant with heavy aphid colonization such as the leaves or along the rachis of a small grain spike. The final scenario for an increased observation of sooty mold is on small grain plants that have prematurely died. This could have been due to insects (i.e.: wheat stem maggot), late season root rots (Fusarium crown rot or common root rot), or abiotic stress (too much or too little water). When the plants die prematurely, it gives an opportunity for the sooty mold fungi to actively colonize the dead and decaying tissue. Regardless of the situation, sooty mold is not the cause of yield loss. The cause of yield loss occurred from a previous limiting factor.

Fusarium

Fusarium graminearum is primarily responsible for Fusarium head blight (scab) in North Dakota. However, the pathogen is also an excellent saprophyte and can colonize dead tissue (similar to sooty mold fungi). A few photos have been submitted that have both sooty mold and orange-salmon colored growth on wheat spikes (Figure 2). The orange to salmon color mold growth is likely *Fusarium graminearum*. When we see heavy colonization of *Fusarium graminearum*, it is either a result from a previous infection of the small grain spike or secondary spread of the fungus onto dead tissue. Keep in mind that *Fusarium graminearum* produces the mycotoxin deoxynivalenol (vomitoxin).

Figure 2. Wheat spike with both sooty mold fungi (black fungal growth) and suspected Fusarium graminearum (orange to salmon colored fungal growth) – Photo by Jeff Stachler.

Ergot

Mature small grain fields present an opportunity to scout for ergot. Ergot can be identified as hard black to purple colored sclerotia that have replaced a developing kernel (Figure 3). The pathogen has a very large host range (59 hosts in North Dakota) and is also commonly found on smooth brome and quackgrass. Therefore, one of the most common places to scout for ergot is along a field edge near grassy weed hosts. If you see a high level of ergot on the field edge, it is best to harvest and store the grain separate from the rest of the field. Toxic alkaloids are present in ergot sclerotia, and strict thresholds are in place for marketed grain. The thresholds are determined as a proportion of ergot sclerotia weight per grain weight. The threshold for wheat is 0.05% and 0.1% for barley. For visual representation, as little as 10 to 15 ergot sclerotia in 2.2 pounds of wheat seed can meet or exceed the 0.05% threshold. Cleaning can help reduce ergot levels in grain samples with a color sorter being the most effective at removing sclerotia.

Figure 3. Ergot sclerotia (yellow arrows) on two wheat heads along a field edge.

Andrew Friskop
Extension Plant Pathology, Cereal Crops

plant science

WINTER GRAIN HARVEST IS UNDERWAY ACROSS THE REGION

Many locations across the state started harvesting winter cereals last week, if not as early as the final days of July. Hard red winter wheat grown at the NDSU Agronomy Seed Farm in Casselton yielded 70-80 bushels per acre with at least 61 lb test weight. Seed quality looks to be good to excellent upon preliminary inspection. ND Noreen yielded approximately

80 bushels per acre and had a test weight of 61.5 lbs per bushel. Considering how very dry fall 2022 was for most of eastern North Dakota, I'm encouraged by the winter wheat yields I've been hearing about. Yields from farther north have ranged from 60-80 bushels according to farmer self-reporting and straw quality has been good to excellent in areas that avoided the deluges of mid-July that hit a few localized areas in North East and North Central ND. Considering that HRWW prices have stayed relatively strong, though the price spread between HRWW and HRSW has widened some since last month, I encourage producers to consider planting winter wheat in 2023. Based on performance in NDSU variety trials, consider trying the following varieties based on winter-hardiness in ND conditions, resistance to lodging, and yield: ND Noreen, SD Andes, AAC-Wildfire, and AAC-Vortex. I think that moving forward, winter wheat will be an important tool for farmers to spread their risk amidst more variable rainfall and snowfall and spread out their workload with earlier harvest of winter grains than spring crops.

On the corn front, I have seen many poor to fair corn fields in the eastern third of the state that were tasseling and silking during the generally very dry conditions of late July and the first days of August. Corn is most susceptible to yield loss during tasseling (VT) and silking (R1) due to a number of factors. Tassels that emerge from moisture-stressed plants may shed pollen earlier than silks emerge as the plant tries to conserve water. This can lead to poor synchrony between pollen availability/ viability and silk receptivity. I think we will see evidence of this in the form of poor to no kernel set in early-planted corn fields that have been subject to water stress since planting. Later planted corn fields that are just starting to tassel have benefitted tremendously from the rain that fell across a good portion of south eastern ND over the weekend of August 5-6. Areas that received more than an inch of rain this past weekend may have had the difference made between very poor and fair yield. In the few pockets where moisture has not been limiting this season, which are few and far between, I expect average to good corn yields to still be possible.

Clair Keene
Extension Agronomist Small Grains and Corn

SOIL SAMPLING AFTER EARLY-SEASON CROPS

Early season crop harvest has begun in many areas of the state. The 'early' season crop planting lasted a month, so the harvest will last a month also. With the stubble still in place, it is an excellent time to begin soil sampling. Past research indicates that although the soil test value a grower receives on an August sample is not absolute (same value forever), the difference plus or minus from the value is not great. However, since many growers let their volunteers grow, or seed a cover crop following harvest, or do both, the nitrate value will decrease through the fall until freeze up. If the August nitrate-N value is low (20 pounds N at 0-2-foot depth), then I believe that the nitrate-N value will not change much through the fall. If the nitrate-N value is greater, then the nitrate-N value will decrease due to cover crop/volunteer N uptake. The N taken up by the cover crop in my experiences is not given up to the next crop, although it likely will appear in a future year in the nitrate-N soil test. Soil test P and pH are stable through the fall, but the soil test K may increase some due to fall frosts, greater soil moisture and K leaching from residue through the fall. The value of sampling directly following harvest and before field work greatly increases the consistency of the 0–6-inch depth sampling due to a more consistent 0–6-inch core compared to sampling after chisel plowing.

SOIL COMPACTION IN SW NORTH DAKOTA LONG-TERM NO-TILL

In recent years, soils in SW North Dakota were wet at planting and at harvest, resulting in field trips that produced compaction. Normally, the SW ND growers are very patient to wait for the right soil conditions for field work, but

patience has its limits. Soils in SW North Dakota are prone to compaction due to the clay chemistry of their soils; kaolinite is a dominant clay in some soils and a significant component of most other SW soils. Illite content is also a dominant clay and significant component, with the traffic-forgiving smectite clays a minor component in most of the region. Kaolinite has no shrink and swell properties and illite has limited shrink and swell properties.
Some growers recognize the compaction, and their mind immediately goes to a chisel plow. Before dragging a chisel plow out of a hedge row or paying a high price for one at auction or a dealer, consider building a shank-style strip-till unit for corn or sunflower within the rotation. A shank-style strip-till unit will crack the soil instead of turning it, eliminating compaction to the depth of the shank and keeping most soil microorganisms happy. In turn, it bares only a portion of the area of soil, and allows the soil in that bare band to warm and dry as a conventional till field. The N supplying capacity of strip-till soils are similar to pure no-till in my N rate studies.

I have had the opportunity to examine a home-made strip-till unit near Center, ND some years ago. It was well made and the input cost into its construction was far less than a new tool from a dealer. With some welding skill and access to parts, it can be done, because I have seen it done.

The components are from front to back:

1. A coulter to cut through residue.
2. Residue manager wheels to move residue out of the band, usually 7-10 inches in width where the shank will follow, and the seed will be placed.
3. The shank- with ability to go about 10 inches deep if necessary, and a tube for fertilizer on back.
4. A couple of covering discs to form a berm 2-4 inches high to cover the shank trench, and so that when the soil settles over the trench, the berm will be near level next spring.

The strip till unit should be the same width as the intended planter and you will need a good GPS unit/signal for the autosteer to direct the planter units into the middle of the cleared strip-till band.

Dave Franzen
Extension Soil Specialist
701-799-2565

AROUND THE STATE

NORTHEAST ND

The dry spell continues with little to no rain in this region. Winter wheat is being harvested while barley and some early spring wheat fields are close to maturity. Most of the spring wheat development is variable throughout the region, ranging from early milk stage to hard dough stages. Soybeans are tall and anywhere between R2-R5 stages. Canola has passed the flowering phase and fields are in pod and seed development stages. Corn is between blistering and early milk stages. Field peas are turning color and will be ready to harvest in 7-10 days. Dry beans, faba beans and flax are at pod and seed filling stages. Overall, crops are going through moisture stress and could benefit from a shot of rain (except mature small grains). Poor pasture conditions are being reported from various counties. Water quality issues might show up in dug-outs and water ponds for livestock.

Soybean aphids continue to rise in numbers forcing many growers to spray. Cereal aphids are also in high numbers in many fields.

Second-generation flea beetles are emerging, and some farmers are complaining about high numbers in their fields. Scab is showing up in fields but at a low level.

Spots in soybean field in moisture stress
Photo: Anitha Chirumamilla, LREC

Flea beetles feeding on canola pods
Photo: Anitha Chirumamilla, LREC

Canola field close to maturity in Cavalier County
Photo: Anitha Chirumamilla, LREC

Spring wheat turning color in Cavalier County
Photo: Anitha Chirumamilla. LREC

Anitha Chirumamilla
Extension Cropping Systems Specialist
Langdon Research Extension Center

NORTHWEST ND

Northwest ND has been mostly cooler (70s and 80s) than usual in the past week. The clouds that have kept temperatures low this time of the year have been pushed away, however, and smoky, hazy skies now blanket the northwest due to winds blowing in from Canadian wildfire areas. The past week has been mostly wet due to a recent series of rain events. There were five events of scattered rain showers and severe thunderstorm that all happened within the past 14 days. Williston received 2.29 inches of rain in the same time span. Small grain crops, pea, lentil, and chickpea that were ready for harvest stayed in the field for a little longer due to wet field conditions. Harvestable crops are wet and harvesting operations are delayed for only a few days or until the crops and fields are dry enough for harvesting operations.

Unfortunately, mother nature had some other plans for some of our crops in a few areas in the northwest. The evening of August 1st, saw a sudden heavy downpour of rain brought about by severe thunderstorms that headed east and then later went southeast. Along with the heavy rain and thunderstorm came strong winds of up 67 mph and bigger than pea sized hail that continuously clobbered crops for about 20 minutes to a couple of hours in affected areas. Crops like canola, sunflower, chickpeas, lentil, pea, soybean, and corn in some parts of Williams, Mountrail, and McKenzie counties were damaged to various degrees. Yield losses were estimated to be between 30 to 100 percent in affected areas. In highly damaged areas, small grains that were ready for harvest right before the storm are now in a state of broken stems

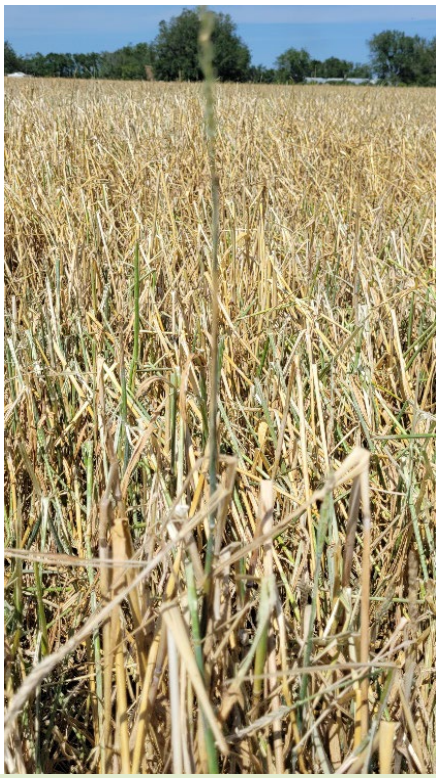
An entire soybean field in southeast Williams County that took heavy damage from hail and wind. Soybeans were at full pod (R4) to beginning of seed (R5) stage with almost no leaves left. Photo taken August 7.

A corn field by highway 1804 damaged by hail. Corn is at milk (R3) to dough (R4) stage. Corn ears are less likely to grow bigger due to broken leaves and less photosynthesis. Photo taken August 7 several miles south of Tioga (Williams County).

Mature peas flattened to the ground along with shattered pods and pea seeds sitting on soil surface, due to strong winds and continued hail for 2 hours at the WREC Irrigated research farm at Nesson Valley. Photo taken August 2.

with mature seed heads laying on the ground alongside shattered grain seeds. Corn, canola, sunflower, and soybean have bruised stems with heavily damaged leaves, or no leaves left at all. Areas around the Nesson Valley got hit pretty hard. The Williston REC Irrigated research farm (located by Highway 1804) reported a total crop loss due to hail from the severe thunderstorm. Some trees around the area were uprooted due to the storms. Producers that farm around Epping area also saw huge yield loss. One farmer quipped about a 6-mile-long hail damage to crops and estimated about a million dollars in losses. Other growers around the area feel the same way about the damage in their own farms. Conversations on crops insurance may become more frequent in the coming days as well as conversations on haying or grazing restrictions of damaged crops that are no longer harvestable.

On the good side, the recent amount of moisture that we got is really good for our late developing crops. Crop stages in the northwest are in a wide range and any amount of moisture received will be great, especially for the late planted crops.



Heavily damaged wheat, not harvestable for any grain. Photo taken from a farmer's field at the Nesson Valley area on August 2 (Williams County).

Heavily damaged sunflower with bruised stems, broken branches, and torn leaves, all due to hail and strong winds. Photo taken from a farmer's field at the Nesson Valley area (Williams County) on August 2.

Charlemagne "Charlie" Lim
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

According to NDAWN, accumulated rain received in this region during Aug 1-7 ranges from less than 0.1 inch at numerous northern locations to 4.2 inches at Brampton (Sargent Co.), with the Carrington Research Extension Center (CREC) receiving 0.35 inch. Driest counties include Wells, Eddy and Griggs. During the past week, average daily water use (date of plant emergence in parenthesis): corn (May 20), soybean (June 1) and dry bean (June 5) was about 0.2 inch.

Winter cereals have been harvested and initial harvest of early seeded spring grain has begun. However, weather, presence of immature tillers, and weeds emerging through crop canopy are delaying harvest. Mid-May planted corn is in the milk (R3) stage and should reach maturity in about 40 days.

Barley with green tillers.

Kochia in mature spring wheat in Wells County.]

The majority of the region's soybean are developing pods and initial seeds (R3-5 stages). Dry beans are developing seed; May-planted and early maturing varieties are rapidly approaching physiological maturity. Early planted sunflowers have drying ray flowers (R6 stage) and will reach maturity in about one month.

Sunflower at R6 stage.

CREC crop tours:

*Row Crop – corn, soybean and dry bean: Thursday, August 31; 4 p.m. registration and 4:30 tour start.

Greg Endres
Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center

weather

WEATHER FORECAST

The Week in Review

Two main rounds of storms brought significant rainfall to southern ND and west central MN this week. On Friday, a low-pressure system began tracking across SD and moist air flowed in along the north side of the circulation. Thunderstorms formed mainly south of I-94 and produced heavy rainfall, especially in southeastern MT, southwestern ND, north central SD, and southeastern ND, with lower amounts in northwestern ND. Storms continued from west to east through Saturday and into early Sunday morning. Radar estimated over 5 inches in the Oakes, ND area, and near West Fargo, ND. Figure 1 depicts radar-estimated totals for this event across the region. The second round began Tuesday afternoon, with thunderstorms forming ahead of a slow-moving cold front, mainly along I-94 from Bismarck to Jamestown, and in western MN. These storms tracked ESE and produced over an inch of rain and pea- to quarter-sized hail. Figure 2 shows total rainfall recorded at NDAWN stations for the past 7 days through Wednesday morning. Figure 3 depicts rainfall departure from normal for the 7-day period ending August 8.

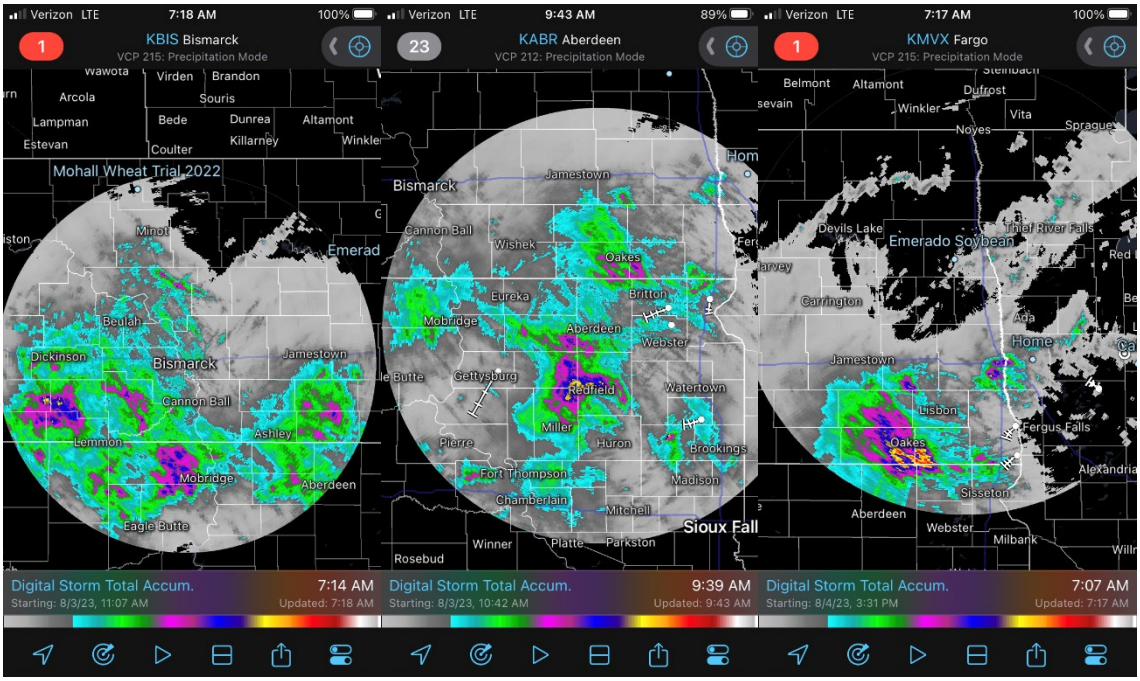


Figure 1. Radar estimated rainfall from Saturday through Sunday morning from regional Doppler radar stations.

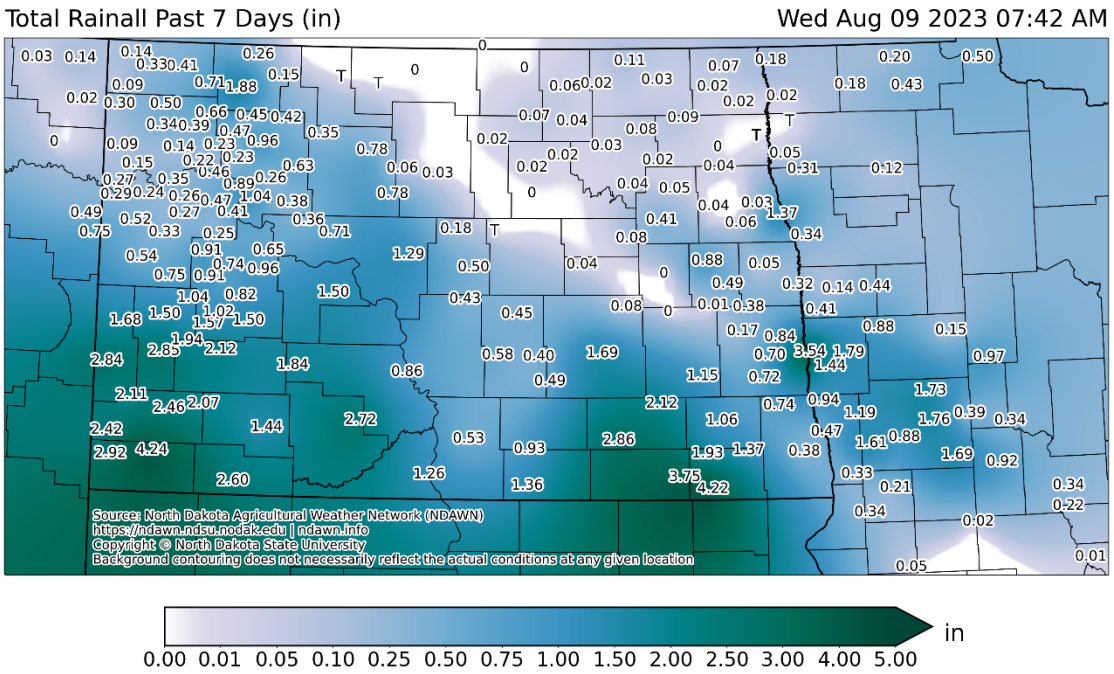


Figure 2. Total rainfall at NDAWN stations for the 7-day period ending at 7:42 AM, August 9.

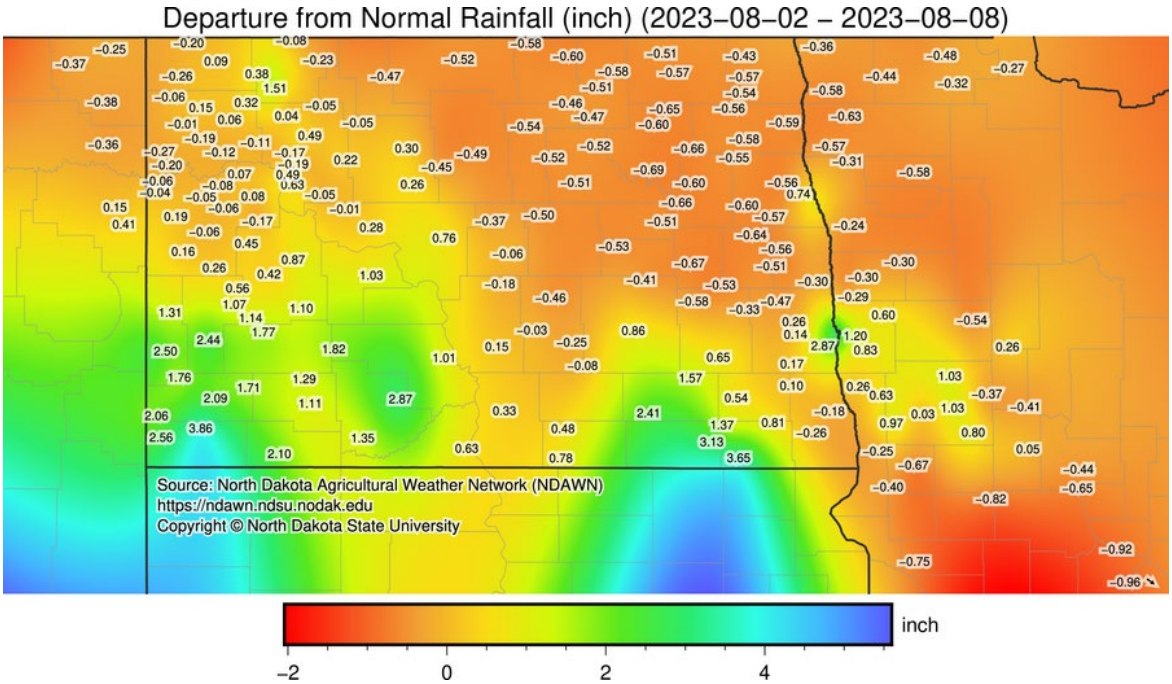


Figure 3. Rainfall departure from normal for the 7-day period ending August 8.

Seven-day changes in soil volumetric water content (VWC) at the 4-inch and 8-inch depths are depicted in Figures 4 and 5. These graphics really depict where ample rainfall occurred. Note that even though northwestern ND received up to 1 inch in localized areas, there wasn't much change in VWC in that area. Unfortunately, drought-stricken areas across northern ND received little to no rainfall. Be sure to check out the latest drought monitor released on August 10.

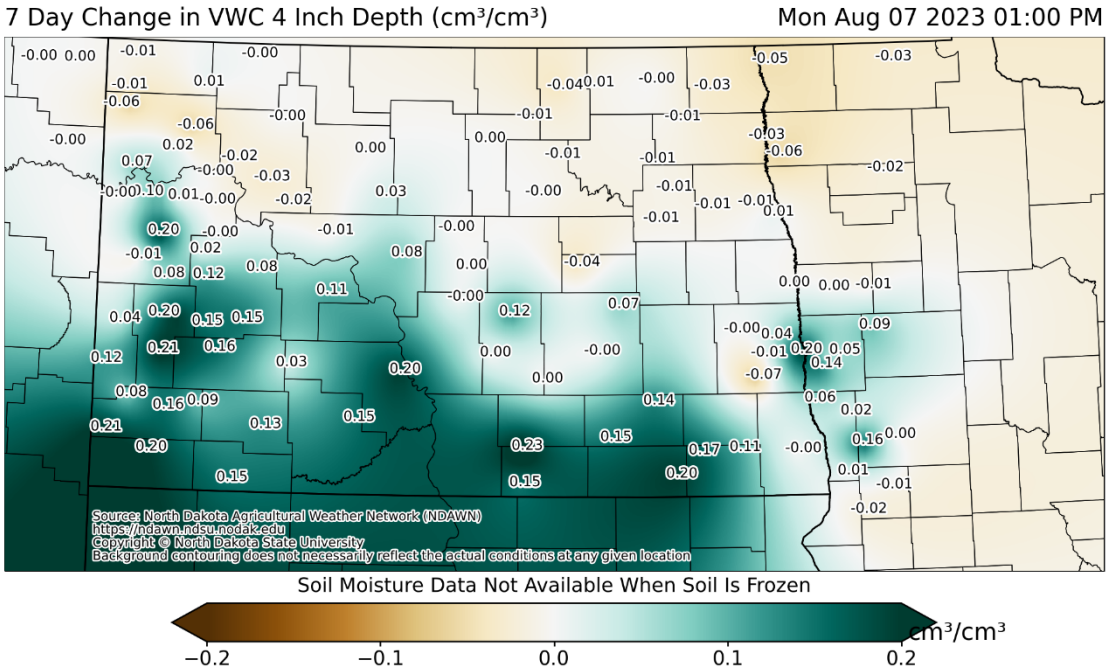


Figure 4. Seven-day change in soil VWC at the 4-inch depth as of 1:00 PM, August 7.

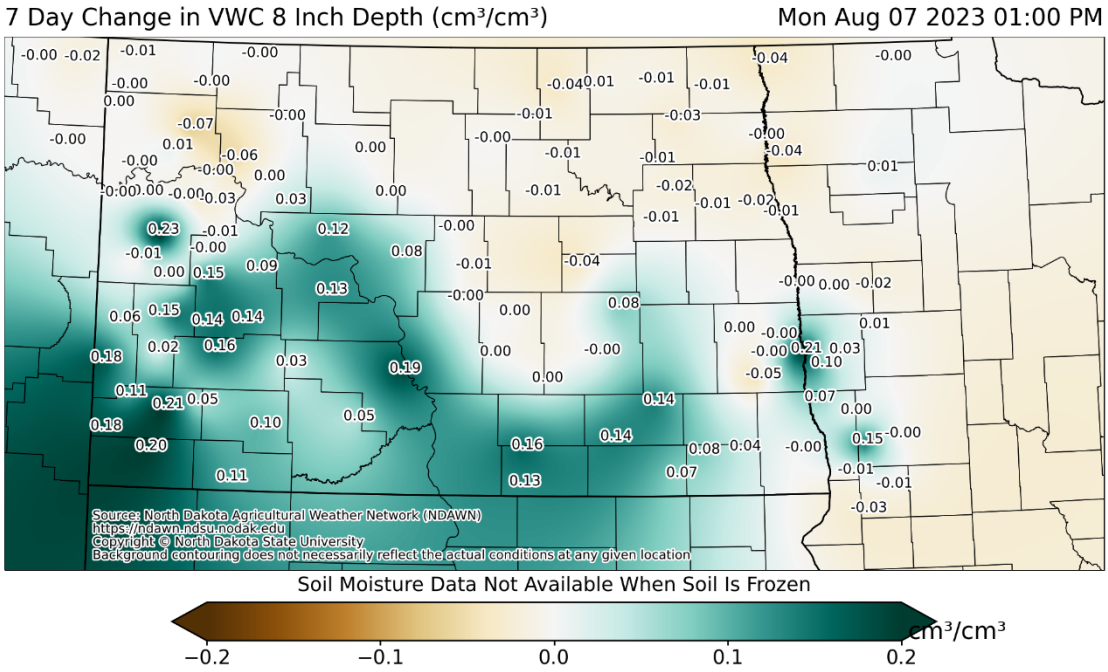


Figure 5. Seven-day change in soil VWC at the 8-inch depth as of 1:00 PM, August 7.

Average air temperature for the past 7 days showed a contrast between east and west, with eastern ND slightly above normal and western ND below normal (Figure 6). Growing degree days for corn/soybean and wheat given a May 1 planting date are depicted in Figures 7 and 8. Most corn I've seen in southeastern ND is in the R2 (blister) to R3 (milk) stages, and soybeans are mostly in R4 (full pod) to R5 (beginning seed). Spring wheat is ripening nicely, and harvest should commence soon. Growing degree days are above normal given a May 1 planting date, but for the most accurate degree day accumulations for your crops in your locations, please visit the main NDAWN website. Under 'Applications'

from the menu, select your crop(s) GDD models, select the nearest NDAWN station, enter your planting date, and select any departure comparisons.

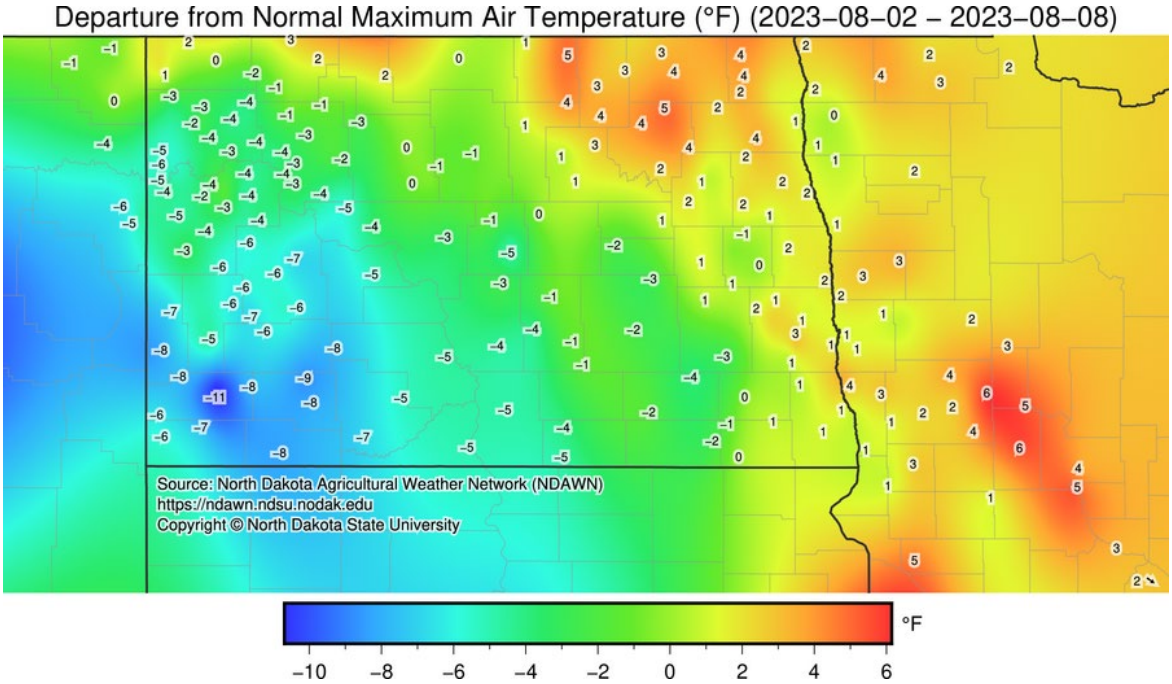


Figure 6. Air temperature departure from normal for the 7-day period ending August 8.

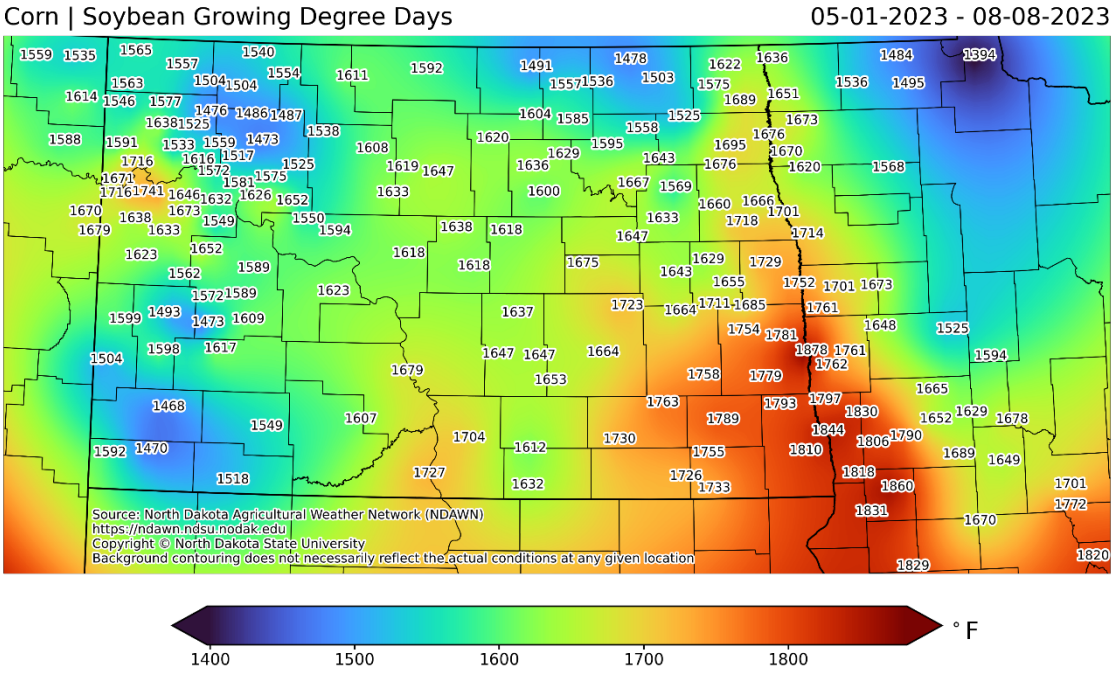


Figure 7. Corn growing degree days from May 1 through August 8.

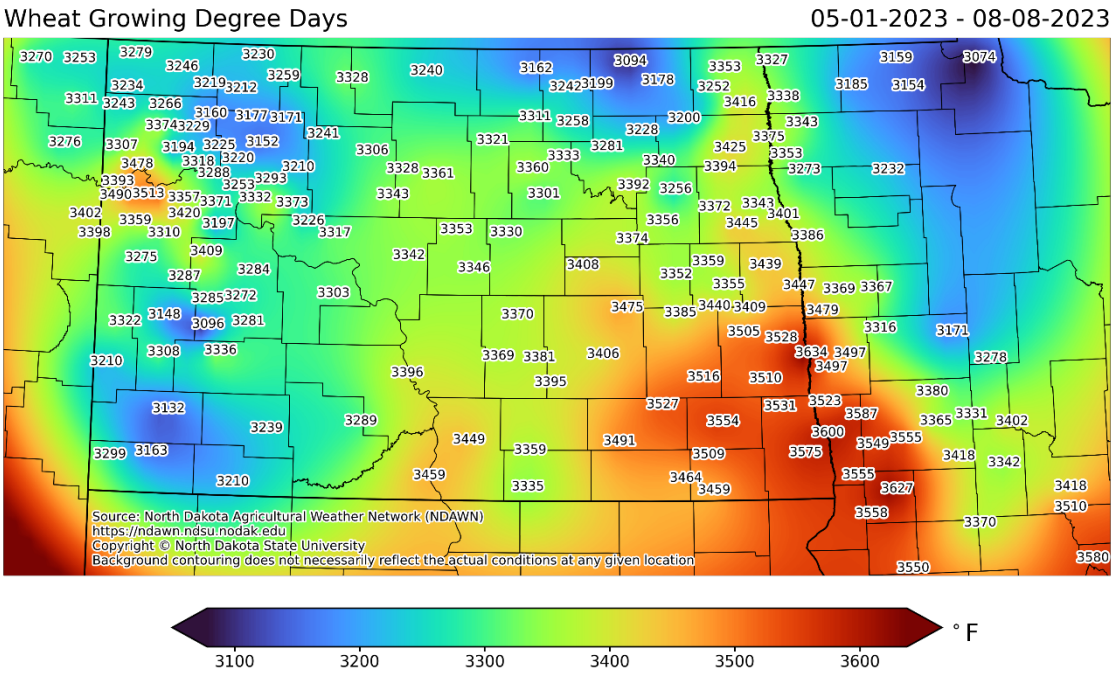


Figure 8. Wheat growing degree days from May 1 through August 8.

Outlook for the Week Ahead

Rainfall potential exists on Thursday, August 10, as a shortwave trough moves into western ND. Storms are expected to move west to east, and northern ND has a good chance for much needed rainfall, as does the eastern Dakotas and all of MN (Figure 9). The trough is expected to move into southeastern ND by late afternoon, and there is a marginal risk of severe weather centered on the SD/MN/NE/IA area, reaching into southeastern ND. One inch hail and strong wind gusts to 60 MPH are the main threats late Thursday. Sunday brings another chance for rain, especially in eastern ND, as another shortwave passes through. Figure 10 shows the precipitation potential for the next 7 days. Temperatures should be close to normal for this time of year, with highs in the low to mid 80sF statewide. Looking further ahead, the 6-10 outlooks favor below normal temperatures and near normal precipitation (Figures 11 and 12).

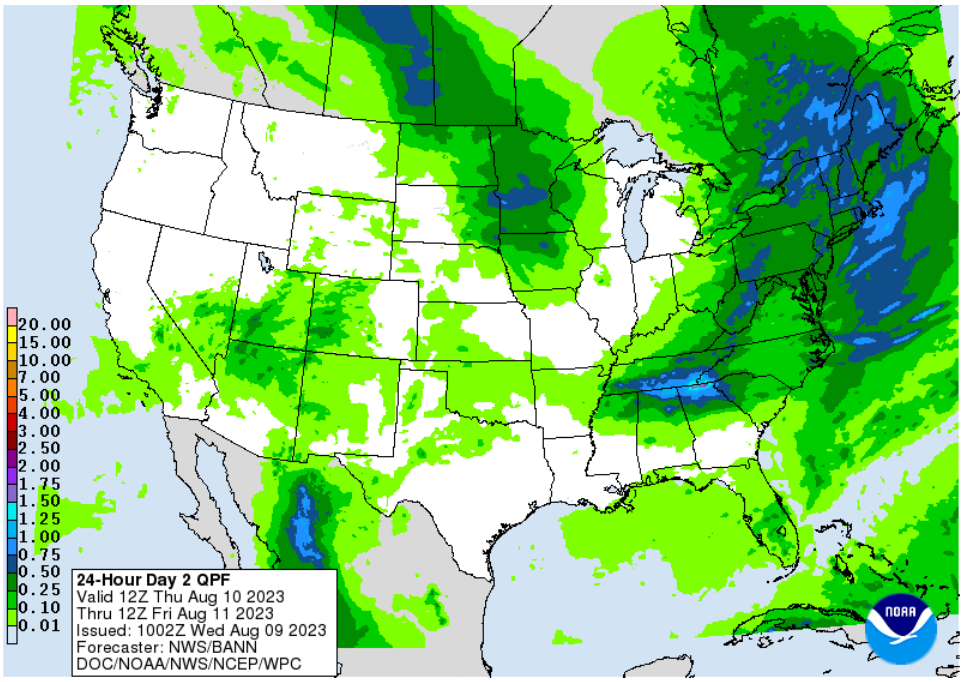


Figure 9. Precipitation potential for Thursday, August 10.

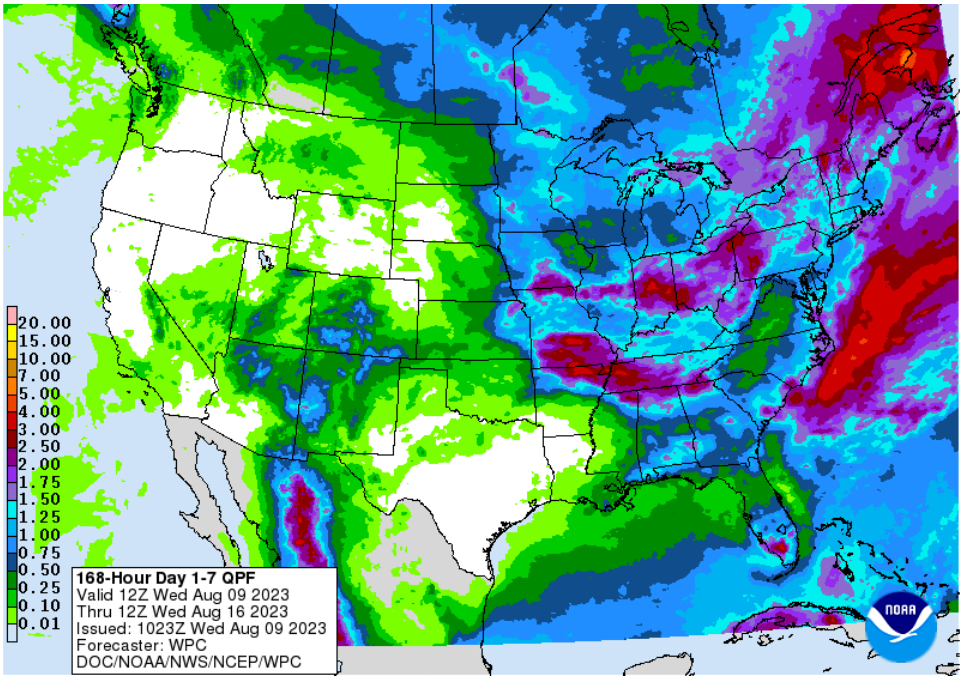


Figure 10. Precipitation potential through 7:00 AM on August 16.

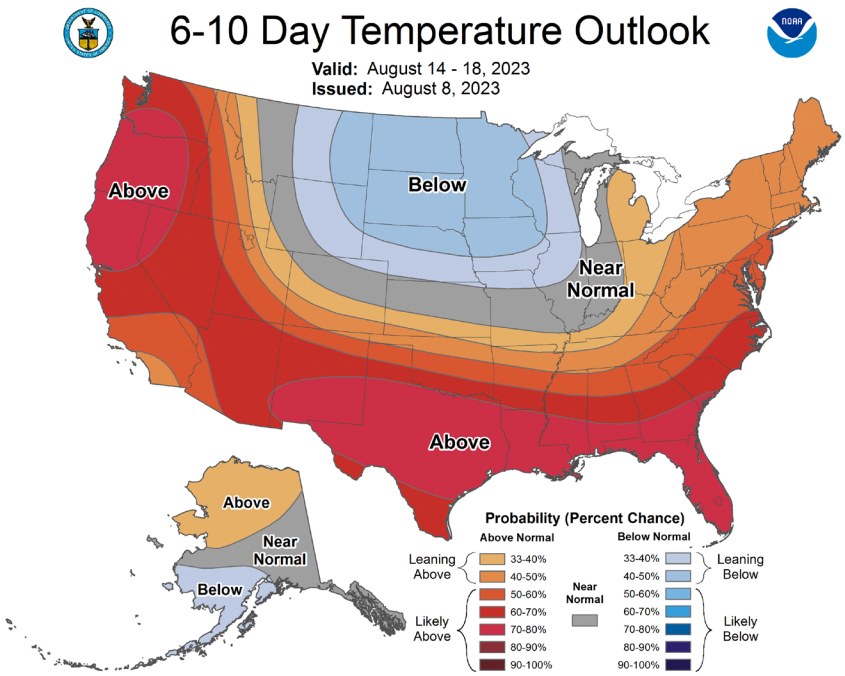


Figure 11. Temperature outlook for the continental U.S. and Alaska from August 14 through August 18.

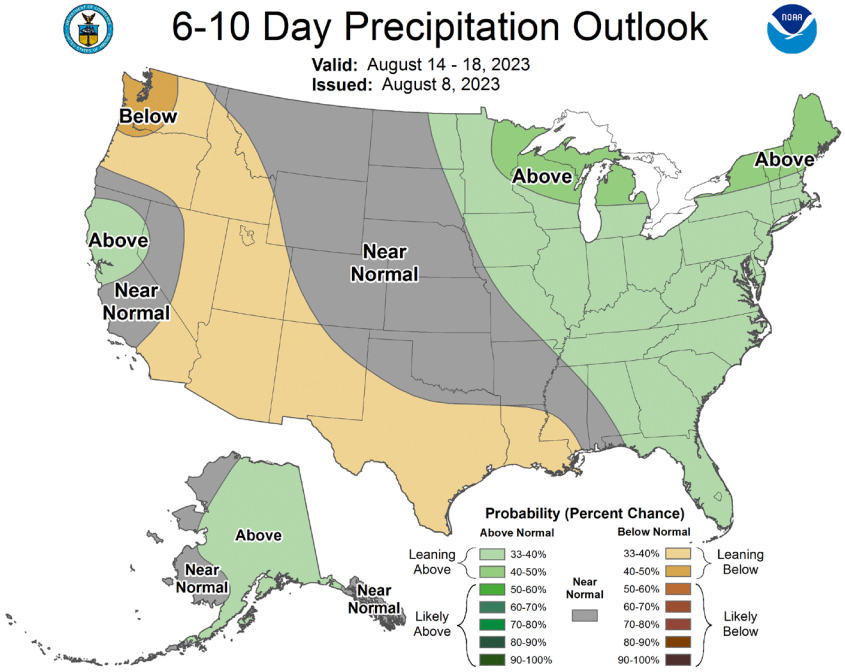


Figure 12. Precipitation outlook for the continental U.S. and Alaska from August 14 through August 18.

Patrick Beauzay
State IPM Coordinator
Research Specialist, Extension Entomology

North Dakota State University
CROP & PEST REPORT
NDSU Dept. 7660; PO Box 6050
Fargo, ND 58108-6050

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Janet Knodel
Co-Editor

Entomology
701-231-7915

Plant Sciences
701-231-7971

Soils
701-231-8881

Sam Markell
Marcia McMullen
Co-Editors

Plant Pathology
701-231-7056

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