

No. 11 July 20, 2023

Inside this Issue...

NDSU Field Days Set.....	1
Canola Insect Trap Update.....	2
European Corn Borer Trap Update	2
Sunflower Insect Trap Update	4
Continue to Scout for Soybean Aphids	4
Scout for Cereal Aphids.....	5
Red Sunflower Seed Weevil Emerging.....	5
North Dakota Small Grain Disease Update	7
Around the State.....	8
Northeast ND	8
Northwest ND	9
Weather Forecast.....	12



NDSU FIELD DAYS SET

NDSU Field Days provide an opportunity for farmers, ranchers and others to hear about the latest research and practices in animal science, agronomy and horticulture.

The North Dakota State University Research Extension Centers' annual field days are set. 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. The field days are open to the public.

The dates and locations for the field days are:

July 10 – Central Grasslands Research Extension Center – Streeter (10 a.m.-3 p.m. CDT)

July 17 – Agronomy Seed Farm – Casselton (5 p.m. CDT agronomy, 7 p.m. supper)

July 18 – Carrington Research Extension Center – Carrington (9:15 a.m.-3:30 p.m. CDT)

July 19 – North Central Research Extension Center – Minot (8:30 a.m.-Noon CDT)

July 20 – Langdon Research Extension Center – Langdon (8:45 a.m.-Noon CDT)

July 25 – Horticulture Research and Demonstration Gardens – Fargo (3-7 p.m. CDT plants, local foods and outdoor spaces)

Aug. 3 – Carrington Research Extension Center’s Oakes Irrigation Research Site – Oakes (8:30 a.m.-noon CDT followed by lunch)

Sept. 9 – NDSU Research Arboretum – Amenia (12:30 p.m.)

NDSU Agriculture Communication

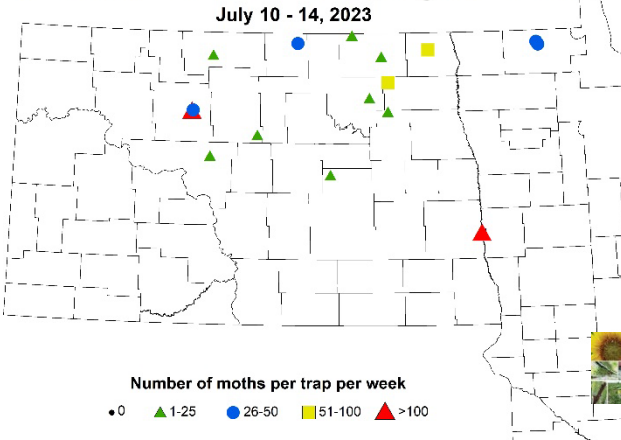
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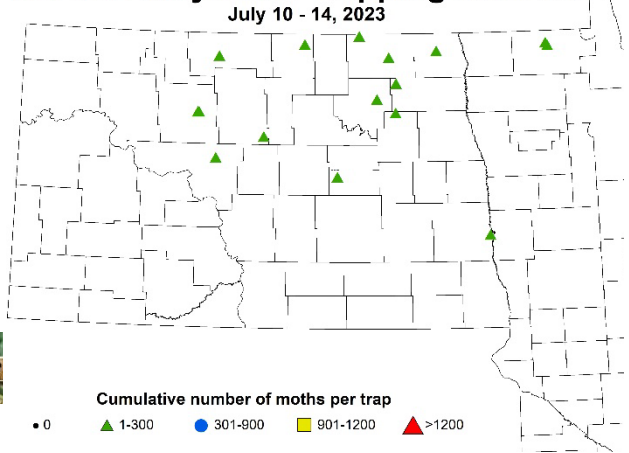
CANOLA INSECT TRAP UPDATE

Pheromone traps for bertha armyworm and diamondback moth are being monitored by IPM scouts and insect trappers through the IPM Crop Survey Program in 16 counties of North Dakota and 1 county in Minnesota. So far, trap counts for **bertha armyworm** continue to be low (<10 cumulative moths per trap per week) at all trap sites. For **diamondback moth**, trap counts increased in the north central (Ward County) and northeast (Pembina and Walsh Counties) canola production areas. Scouting for diamondback moth is recommended in these areas with **high weekly trap catches of over 100 moths per trap per week**.

Diamondback Moth Trapping Network



Bertha Armyworm Trapping Network



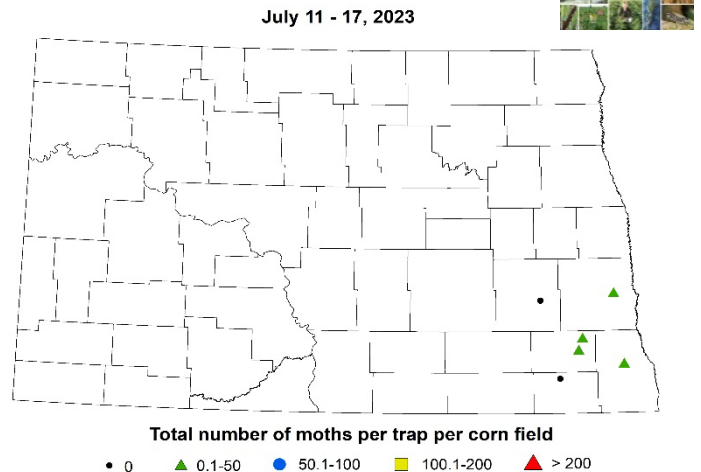
EUROPEAN CORN BORER TRAP UPDATE



European corn borer moth
(*V. Calles Torrez*)

This past week, trap counts for the Z-race ECB moths were similar to last week's counts at all trap sites. The E-race ECB moth has not been detected in traps. See map on right and Table 1 (next page). Overall, ECB moth trap counts continue at low levels.

European Corn Borer Trapping Iowa (or Z-race)

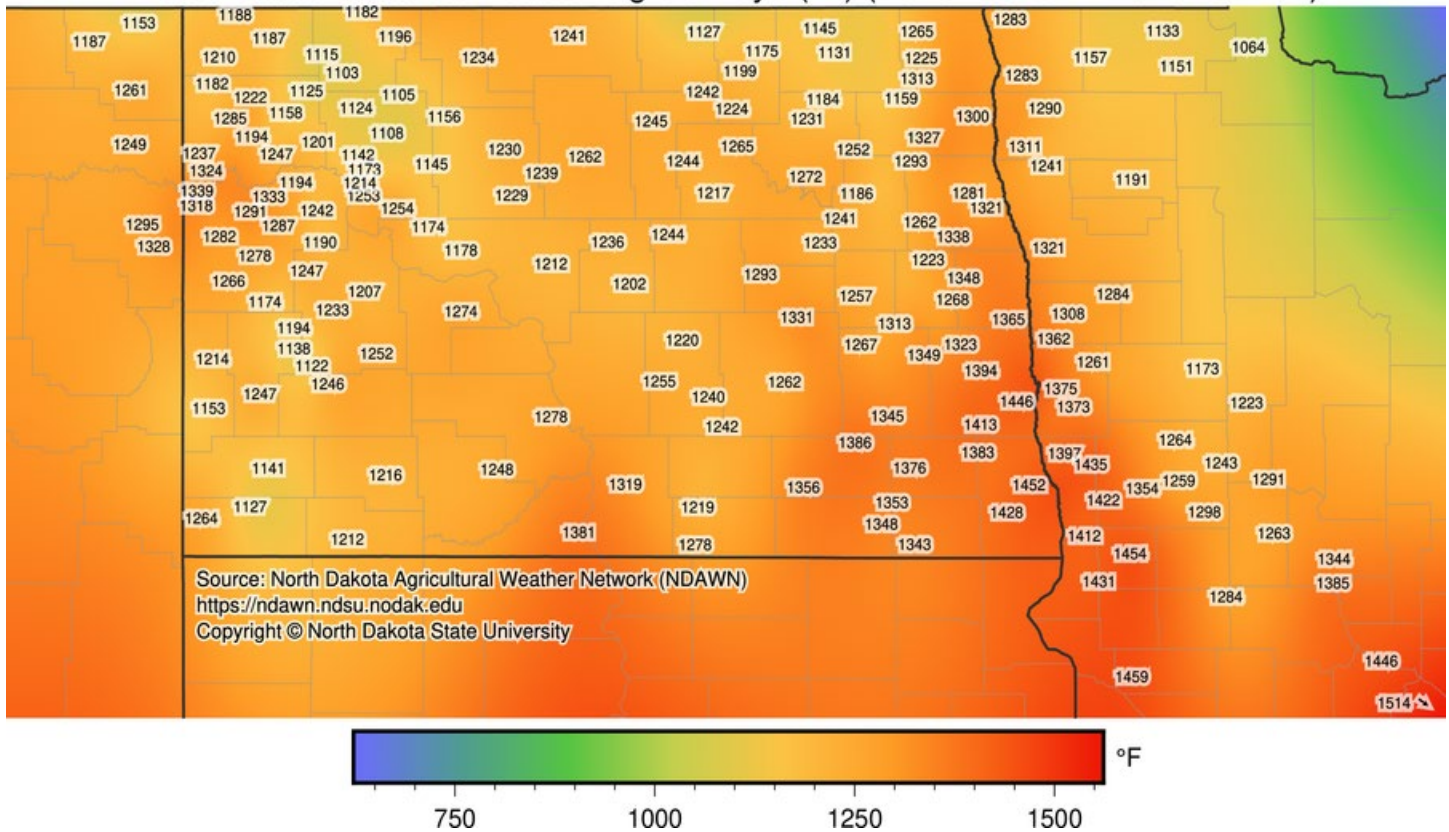


Area	County	Nearest town	ECB Z-race moths					Total trap	ECB E-race moths					Total trap	
			June 13-19	June 20-26	June 27-July 3	July 4-10	July 11-17		June 13-19	June 20-26	June 27-July 3	July 4-10	July 11-17		
EC	Barnes	Cuba	0	0	0	0	0	0	0	0	0	0	0	0	0
EC	Cass	Mapleton	0	0	1	1	1	3	0	0	0	0	0	0	0
SE	Sargent	Gwinner	0	1	27	23	25	76	0	0	0	0	0	0	0
SE	Ransom	Shenford	0	14	47	14	20	95	0	0	0	0	0	0	0
SE	Ransom	Sheldon	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	Richland	Mooreton	0	1	7	3	1	12	0	0	0	0	0	0	0
Total moths			0	16	82	41	47	186	0	0	0	0	0	0	0

Degree Days for Univoltine ECB moth: The accumulated degree days (ADD) indicate a range from about >1100 ADD (75% moths emerged) in the northern half of North Dakota to >1300 ADD (90-100% moths emerged) in southeastern North Dakota (see Table 1 and map below).

Scouting is critical in non-Bt fields. Look for eggs and small larvae.

Accumulated Base 50 Insect Degree Days (°F) (2023-03-01 – 2023-07-17)

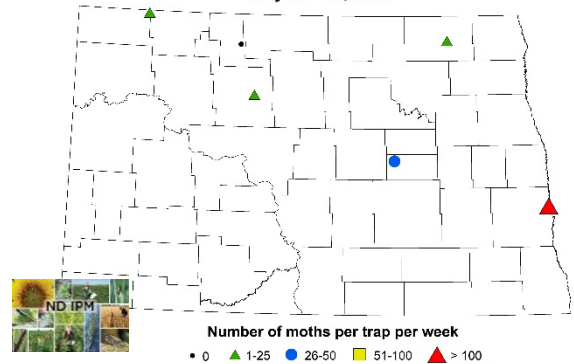


SUNFLOWER INSECT TRAP UPDATE

Banded sunflower moth continues to be trapped in pheromone traps with the higher densities in southeast and east central areas of North Dakota. Other trapping sites are generally low.

No sunflower head moth was trapped. Few *Arthuri* sunflower moths were trapped, <10 moths per trap per week, at only 3 sites.

Banded Sunflower Moth Trapping Network
Cochylis hospes
July 10 - 14, 2023



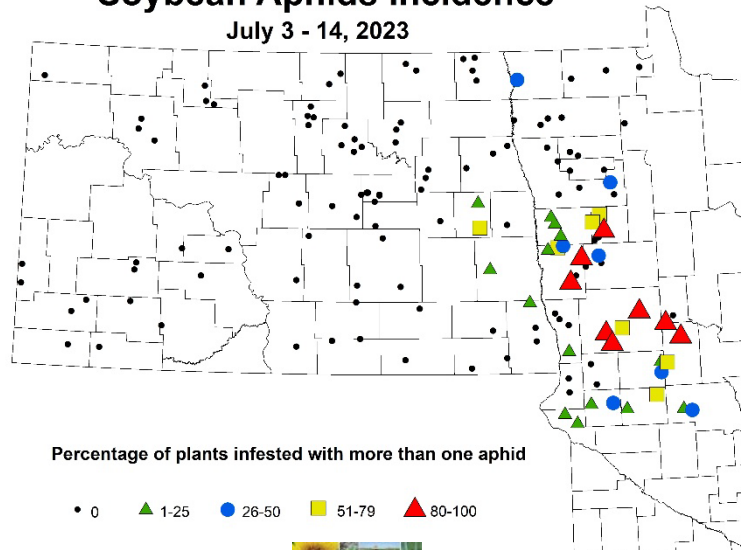
CONTINUE TO SCOUT FOR SOYBEAN APHIDS

Soybean aphids are being observed by IPM Scouts at 0-65% incidence and low densities of <0-40 aphids per plant in only 6% of fields scouted in southeast and east central areas of North Dakota. Higher incidence (0-100%) and numbers of aphids per plant (0-520 aphids per plant) are being recorded in 40% of fields scouted in west central Minnesota. Please send me your field reports for soybean aphid counts and locations.

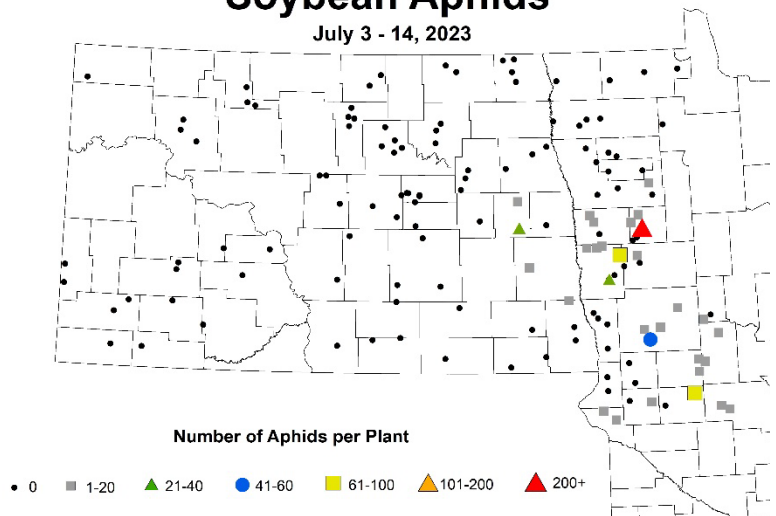
The **critical growth stages** for making most soybean aphid treatment decisions in North Dakota is from the late vegetative to early reproductive stages (R3 – beginning pod). Assessing aphid populations at this time is critical.

Economic Threshold: R1 (beginning of flowering) to R5 (beginning seed) = average of 250 aphids per plant, 80% of plants infested and when populations are actively increasing.

Soybean Aphids Incidence
July 3 - 14, 2023



Soybean Aphids
July 3 - 14, 2023



SCOUT FOR CEREAL APHIDS

Cereal aphids continue to be non-economic and were observed in 21% of the 70 wheat fields scouted by the IPM Crop Scouts. Few fields had economic populations of cereal aphids in south central North Dakota. Field scouting should begin at stem elongation and continue up to the early dough stage of wheat.

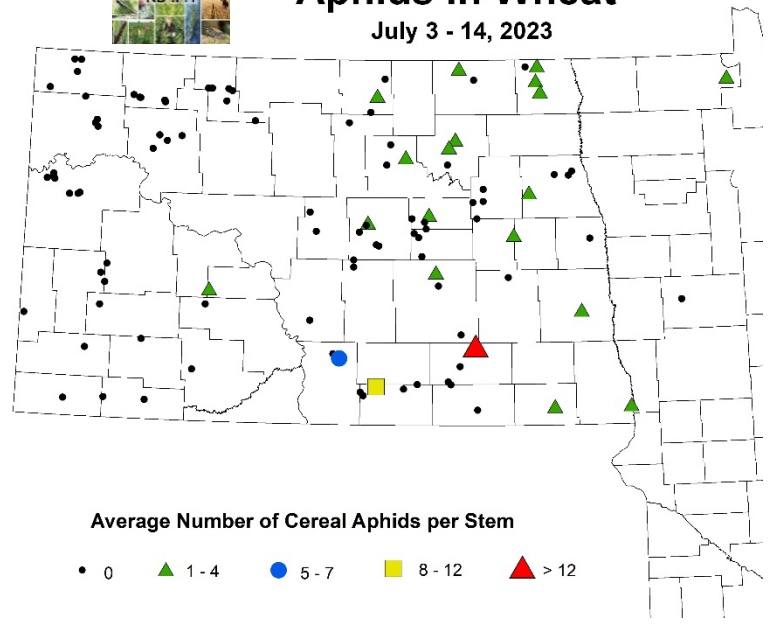
Economic Thresholds for Cereal Aphids in Wheat, Barley or Oats

- 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



Aphids in Wheat

July 3 - 14, 2023



Average Number of Cereal Aphids per Stem

- 0
- ▲ 1 - 4
- 5 - 7
- 8 - 12
- ▲ > 12

RED SUNFLOWER SEED WEEVIL EMERGING



Red sunflower seed weevil adult (J. Knodel)

2023 RSSW Threshold

Oilseed sunflower at 23 cents per lb and 22,000 - 18,000 plants per acre
\$10 insecticide + application cost per acre – 4 - 5 weevils per head
\$12 insecticide + application cost per acre – 5 - 6 weevils per head

Confection sunflowers:
1 weevil per head

Red sunflower seed weevils (RSSW) are emerging in North Dakota and South Dakota in a few early planted sunflower fields. Start scouting as soon as sunflowers are in the R4 (bud open ray flower visible) to R5.1 (early flower - florets around the outer perimeter of the sunflower head). Please send me your reports including locality and numbers when you start finding RSSW.

Identification: RSSW are small ($\frac{1}{8}$ inch long) weevils with a snout and are reddish-orange.

Scouting & Threshold: When sampling, use the X pattern and begin counting at least 75 to 100 feet into the field to avoid field margin effects. Rub your hand vigorously across the sunflower face. Count the number of RSSW adults on 5 plants at 5 sites for a total of 25 plants per field. Scout for adults in the early blooming sunflower fields when the yellow ray petals are just beginning to show. RSSW is attracted to early blooming sunflowers, as females must imbibe pollen before laying eggs. A NDSU YouTube video is available on [Scouting for Red Sunflower Seed Weevil in Sunflowers](#). Scouting should continue until the economic threshold (Tables 1 & 2, next page) is reached or most plants have reached 70% pollen shed (R5.7). At 70% pollen shed, plants are no longer susceptible for egg laying or significant damage. On

older flowering plants (after R5.7), larvae of RSSW (and banded sunflower moth larvae) will be feeding inside the seeds and are protected from the insecticide. By then, much of the feeding damage has already occurred.

Insecticides: There are two different Modes of Action to choose from for RSSW control - pyrethroids, IRAC Group 3A, and carbamates, IRAC Group 1A. The diamides, IRAC Group 28, control only the Lepidopteran larvae and grasshoppers, and do not control red sunflower seed weevil. For insecticides registered, please consult the [E1143-23 - North Dakota Field Crop Insect Management Guide](#). The ideal plant stage for treatment is when most individual plants are at 40% pollen shed. However, we recommend that treatment be considered when three out of 10 plants are just beginning to shed pollen.

Reduced susceptibility to pyrethroid class insecticides was first observed in red sunflower seed weevil in central South Dakota during 2017. SDSU Extension Entomologists also have observed very high populations of weevils in South Dakota the last several years, e.g. 300 to 1,000 adults per sunflower head. Collaborative research conducted in North Dakota and South Dakota confirmed that **the tested populations of red sunflower seed weevils in South Dakota in 2022 were resistant to the active ingredients lambda-cyhalothrin (Warrior and generics) and esfenvalerate (Asana XL). These products should be avoided in South Dakota areas where field failures have occurred during previous years. So far, research in North Dakota has NOT CONFIRMED any weevils with pyrethroid resistance.**

Source: [Adam Varenhorst et al. Pest and Crop Newsletter July 17, 2023](#)

Table 1. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals \$10 per acre.

Market Price	Sunflower Plants per Acre (x 1,000)									
\$ per lb	16	17	18	19	20	21	22	23	24	25
0.18	6.5	6.1	5.8	5.6	5.3	5.1	4.9	4.7	4.5	4.3
0.19	6.2	5.9	5.6	5.3	5.1	4.8	4.6	4.5	4.3	4.1
0.20	5.9	5.6	5.3	5.1	4.8	4.6	4.4	4.2	4.1	3.9
0.21	5.7	5.4	5.1	4.8	4.6	4.4	4.2	4.1	3.9	3.8
0.22	5.4	5.1	4.9	4.6	4.4	4.2	4.0	3.9	3.7	3.6
0.23	5.2	4.9	4.7	4.5	4.2	4.1	3.9	3.7	3.6	3.4
0.24	5.0	4.7	4.5	4.3	4.1	3.9	3.7	3.6	3.4	3.3
0.25	4.8	4.6	4.3	4.1	3.9	3.8	3.6	3.4	3.3	3.2
0.26	4.7	4.4	4.2	4.0	3.8	3.6	3.5	3.3	3.2	3.1
0.27	4.5	4.3	4.0	3.8	3.7	3.5	3.3	3.2	3.1	3.0
0.28	4.3	4.1	3.9	3.7	3.5	3.4	3.2	3.1	3.0	2.9
0.29	4.2	4.0	3.8	3.6	3.4	3.3	3.1	3.0	2.9	2.8

Table 2. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals \$12 per acre.

Market Price	Sunflower Plants per Acre (x 1,000)									
\$ per lb	16	17	18	19	20	21	22	23	24	25
0.18	7.8	7.4	7.0	6.7	6.4	6.1	5.8	5.6	5.4	5.2
0.19	7.4	7.0	6.7	6.4	6.1	5.8	5.6	5.3	5.1	4.9
0.20	7.1	6.7	6.4	6.1	5.8	5.5	5.3	5.1	4.9	4.7
0.21	6.8	6.4	6.1	5.8	5.5	5.3	5.1	4.9	4.7	4.5
0.22	6.5	6.2	5.8	5.6	5.3	5.1	4.9	4.7	4.5	4.3
0.23	6.2	5.9	5.6	5.3	5.1	4.9	4.7	4.5	4.3	4.1
0.24	6.0	5.7	5.4	5.1	4.9	4.7	4.5	4.3	4.1	4.0
0.25	5.8	5.5	5.2	4.9	4.7	4.5	4.3	4.1	4.0	3.8
0.26	5.6	5.3	5.0	4.8	4.5	4.3	4.2	4.0	3.8	3.7
0.27	5.4	5.1	4.8	4.6	4.4	4.2	4.0	3.8	3.7	3.6
0.28	5.2	4.9	4.7	4.5	4.2	4.1	3.9	3.7	3.6	3.4
0.29	5.1	4.8	4.5	4.3	4.1	3.9	3.8	3.6	3.5	3.3

Janet J. Knodel, Extension Entomologist

NORTH DAKOTA SMALL GRAIN DISEASE UPDATE

The IPM scouts visited 70 wheat fields and 27 barley fields last week. The most prevalent foliar disease in wheat was bacterial leaf streak (BLS) and was found in 10% of the fields (Figure 1). The highest BLS incidence within a wheat field was 22% (i.e., 22 out of 100 plants had BLS symptoms). Leaf rust on wheat was detected at the Hettinger Research Extension Center on July 11. For barley, the most common foliar diseases were fungal leaf spots (net blotch and spot blotch) and were reported in 15% of the fields. Most of the fungal leaf spots in barley were in the lower canopy and at a low severity.

Fusarium head blight (scab) reports have been received from county agents, crop consultants, and agronomists. The number of scabby spikes in a field has been low, and it is likely we will have more field reports of scab in the next 7 to 10 days. The best time to look for scab is at the beginning of late milk to early dough stages of development (about 14 to 16 days after early flowering). Symptoms include premature bleaching of the wheat spikes and range from a single spikelet to an entire head (Figure 2). For more information on Fusarium head blight, please review the NDSU Extension publication: <https://www.ndsu.edu/agriculture/sites/default/files/2022-08/pp804.pdf>.



Figure 1. Bacterial leaf streak on the flag leaves of wheat. Notice yellow to brown streaks running parallel with the leaf. You will also observe bacterial ooze and water-soaking on infected leaves.



Figure 2. Fusarium head blight (scab) on wheat spikes in a dryland research plot on the NDSU main campus. Note varying levels of scab severity (how much of a spike infected) in the research plot.

[Andrew Friskop](#)

Extension Plant Pathology, Cereal Crops



AROUND THE STATE

NORTHEAST ND

Drought continues in many areas of the region. Crops are all over the chart from being poor to good depending on the location of the field and whether it received rain or not. Many small grains and corn fields are showing symptoms of drought, such as browning and rolling of leaves.



Bacterial blight in soybeans
Photo: Anitha Chirumamilla

In terms of development, most of the crops are in reproductive phases. Corn is tasseling and some are silking. Soybeans are ranging from V4-R3 stages. Canola is in full bloom and pod setting stages. Small grains are from heading to soft dough stages. Winter wheat is turning color. Field peas are at pod filling. Sunflowers are at R1-R3. Dry beans and flax are flowering.

Soybean aphids and pea aphids have been spotted in Cavalier County. The numbers are low and infestations are in isolated spots. Frequent scouting is encouraged to monitor the populations as aphids have the ability to multiply quickly in favorable conditions. Scouting protocols are recommended for cereal aphids, too. The aphids are moving onto developing heads and feeding on the kernels. Usually, at low numbers, aphid populations are kept under control by a

healthy population of good bugs like lady beetles, syrphid flies, lacewings, parasitic wasps, damsel bugs, minute pirate bugs etc., While monitoring for aphids, it is recommended to check for the good bugs population before considering spraying options.

In canola, diamondback moths are flying. These are second generation moths that are emerging from cocoons. In general, the larvae from these moths are more damaging as the larvae feed on the flowers and pods, causing direct yield loss. Keep scouting as the populations might reach threshold levels quickly.

Crop Tours

Pembina and Grand Forks counties are hosting their crop tours on Monday July 24th and Thursday July 27th respectively. Please take time to attend these events that discusses various seasonal updates and varietal trials in those counties. Contact respective County Extension agents for more information.



Soybean aphids in Cavalier County
Photo: Bailey Reiser, ANR Agent Cavalier County

[Anitha Chirumamilla](#)

Extension Cropping Systems Specialist
Langdon Research Extension Center

NORTHWEST ND

Recent weather in northwest ND feels like June weather occurred in July while July weather occurred in June. In June, the northwest experienced temperatures in 80s and early 90s°F resembling July weather, but the recent weeks of July temperatures were in the 70s and low 80s°F which are usually experienced in June. In the past seven days, the highest daytime temperatures in the northwest have been mostly in the 70s°F. Most crops look great and much better looking compared to how they were in the weeks prior. This crop improvement was largely due to the broad blanket of rain that the northwest received early last week. As per NDAWN weather data, most areas in the northwest received 0.25 to 0.30" or more on July 11, some received up to 0.94" of rain, like Keene, but there were a few sites, like Portal, that received none. The cooler temperatures coupled with the rain event early last week really helped our crops recover and

grow. This unusual weather pattern is especially beneficial when most of our crops are flowering or at seed formation or seed fill stage. These crop stages are critical due to high crop sensitivity to heat and drought stresses. If the stresses are experienced during the critical crop stages, reduced crop yield are to be expected. However, soils are starting to get dry again and with temperatures forecasted to be in the 90s°F starting this weekend through most of next week, with almost no rain in sight, crops could quickly experience high temperatures and moisture stresses. Because the rain and thunderstorms received in the northwest have been scattered and sporadic in the past weeks, crops that are going to be affected the most by the upcoming hot weather conditions are those in fields that had very little rain in the past month and a half. For the most part crops are looking good in the northwest. The most advanced crop stages seen so far are tasseling in corn, soft dough in small grains, mid-maturity in pea, R5 in chickpea and lentil, R3 in soybean, seed development in canola, R2 in sunflower, and more boll/capsules formation in flax.



Oats cut for hay after flowering. Photo taken July 17 near Powers Lake, ND (Mountrail County).



Canola at full bloom near Flaxton, ND (Burke County). Photo taken on July 17.



Spring wheat at late flowering stage near Bowbells, ND (Burke County). Most of the spring wheat in the eastern part of Northwest ND were planted much later and have yet to turn color compared to wheat fields close to the Montana border which have already turned yellow.



Spring wheat at soft to hard dough stage. Kochia patches dot the wheat landscape in areas with poor wheat stand and bare soils. Kochia also took advantage of the now less competitive wheat crop as wheat yellows and transitions towards maturity. Photo taken July 17 near Crosby, ND.

The NDSU Williston Research Extension Center hosted its dryland and irrigated research field days last July 12 and 13, respectively. Graced with enthusiastic and curious attendees from all ages near and far, and enriched with excellent scientists and researchers that gave talks on current research (including horticulture) at the center, the field days were a success. On behalf on NDSU Williston REC, we'd just like to say thank you so much to all parties involved and thank you for coming out!



NDSU Williston Research Extension Center (WREC) dryland crops research tour held on July 12 at the WREC dryland farm just west of Williston, ND.



NDSU Williston Research Extension Center irrigated crops research tour held on July 13 at the Nesson Valley irrigated farm located 23 miles east of Williston by Highway 1804.

[Charlemagne "Charlie" Lim](#)
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

WEATHER FORECAST

The Week in Review

Average air temperatures and rainfall were below normal across North Dakota last week (Figures 1 and 2). We did see some severe weather on the evening of July 13 in a line from eastern ND into western MN. One cell in particular dropped up to 2" diameter hail near Mapleton in Cass County, ND and 2.75" diameter hail near Downer in Clay County, MN as the storm tracked into Otter Tail County, MN. Some crop damage, especially to corn (see photo), occurred along this path, property damage was reported and wind damage also was reported along the path of the storm. Please see the Storm Prediction Center's [severe weather reports for July 13](#) for a full list of reported events.



Hail-damaged corn near Mapleton, ND. Photo by Patrick Beauzay, NDSU Extension.

Soil moisture at the 4-inch and 8-inch depths remains deficient across much of the state (Figures 3 and 4).

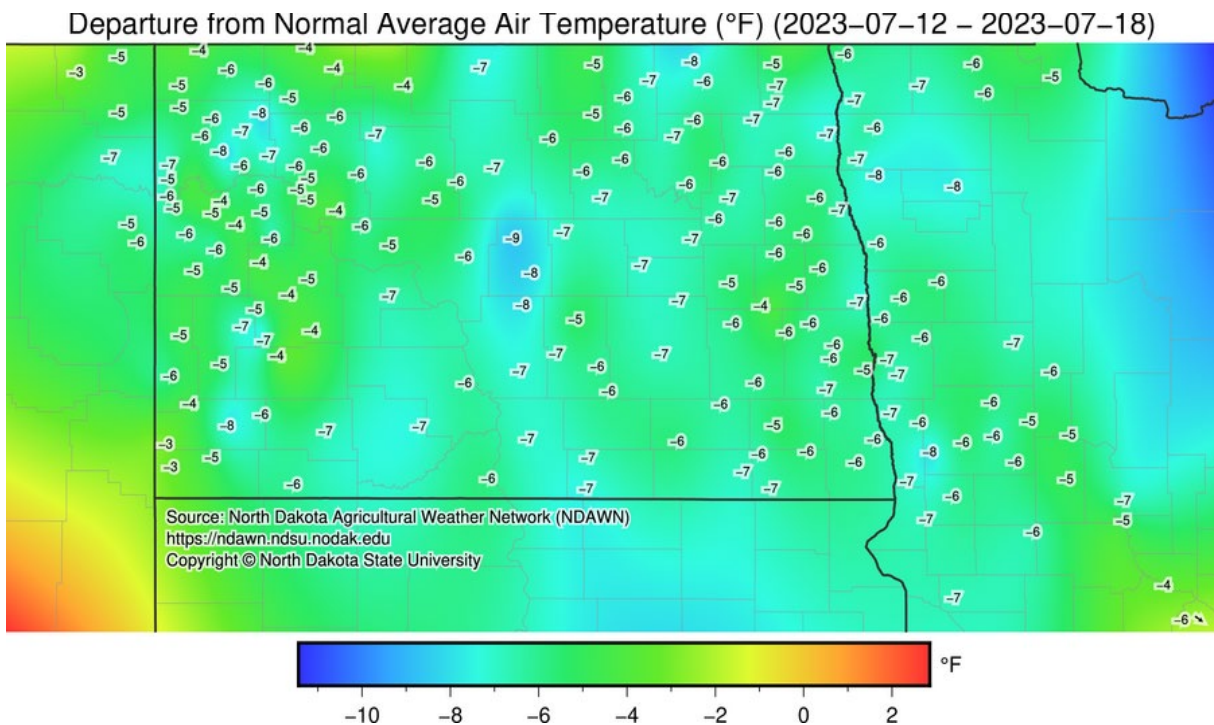


Figure 1. Average air temperature departure from normal from July 12 through July 18.

Departure from Normal Rainfall (inch) (2023-07-12 – 2023-07-18)

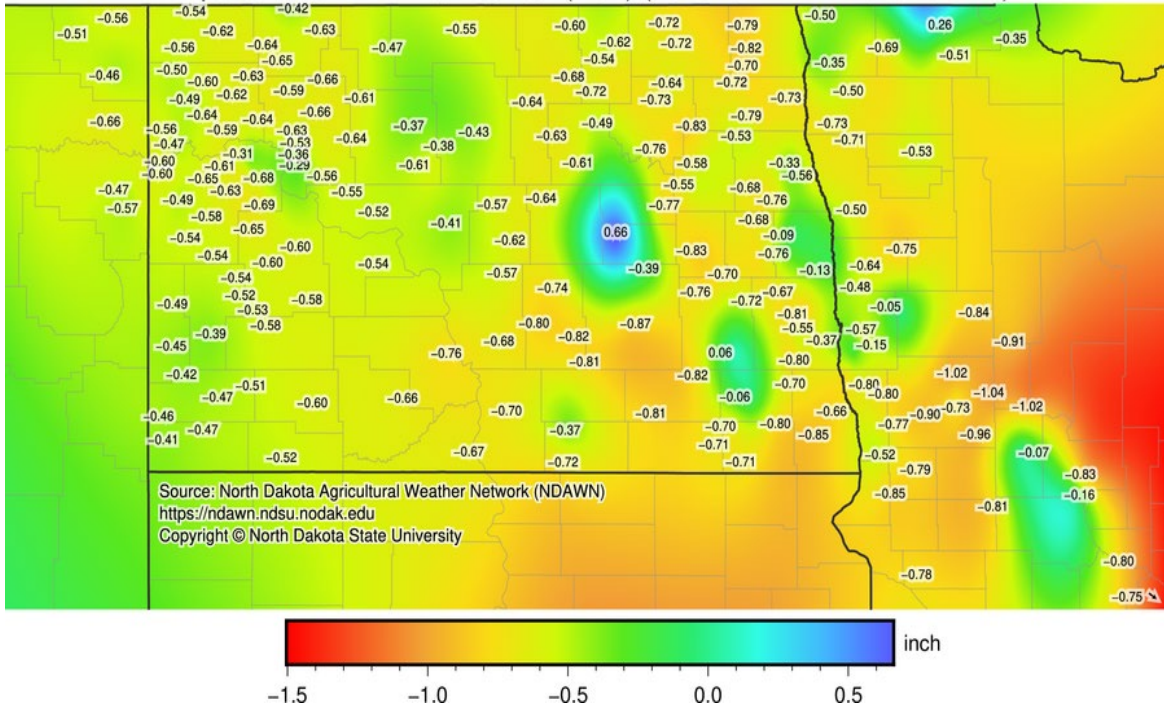


Figure 2. Rainfall departure from normal from July 12 through July 18.

Soil Moisture 4 Inch Depth

Wed Jul 19 2023 08:00 AM

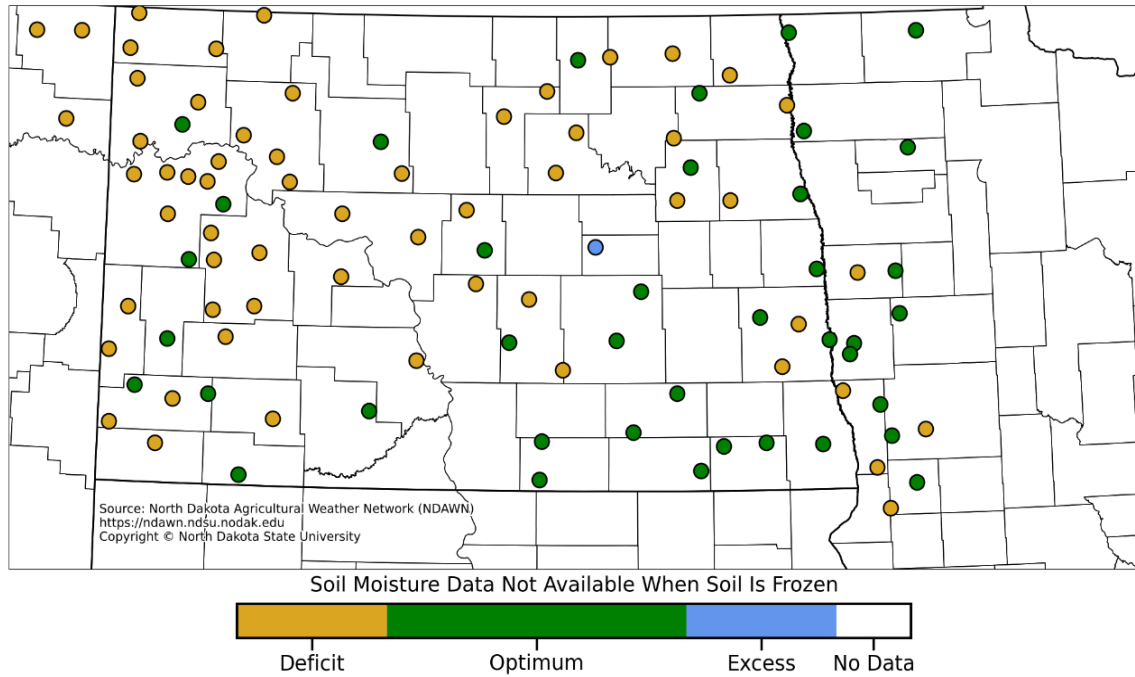


Figure 3. Soil moisture conditions at the 4-inch depth as of 8:00 a.m. on July 19.

Soil Moisture 8 Inch Depth

Wed Jul 19 2023 08:00 AM

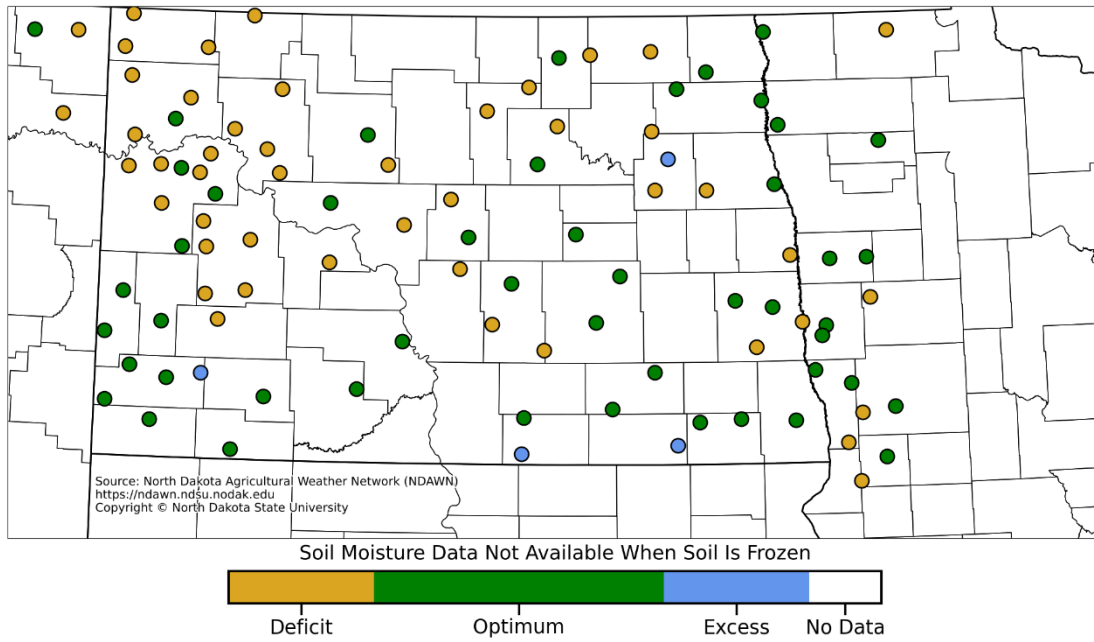


Figure 4. Soil moisture conditions at the 8-inch depth as of 8:00 a.m. on July 19.

Accumulated growing degree days (GDD) and GDD departures from normal for corn/soybean and wheat are given in Figures 5-8. Despite a cool first half of July, GDD have trended above normal due to record or near-record heat in June.

Corn Accumulated Growing Degree Days (°F) (2023-05-01 – 2023-07-18)

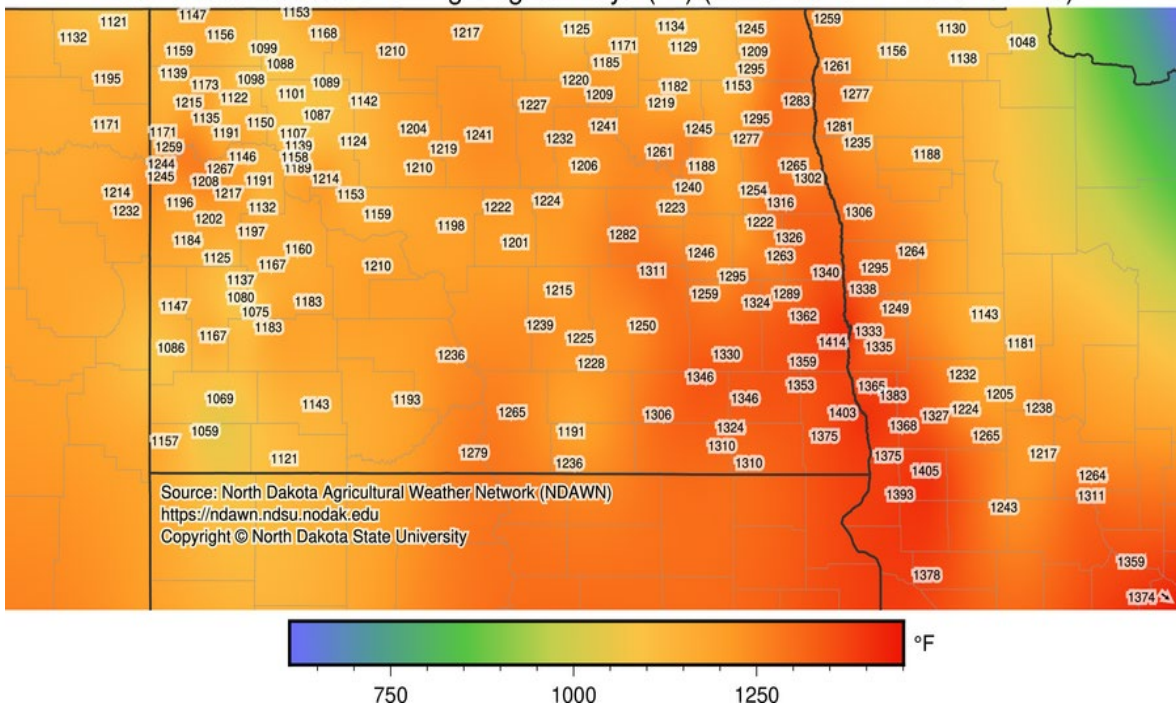


Figure 5. Accumulated growing degree days for corn and soybean (base 50°F) from May 1 through July 18.

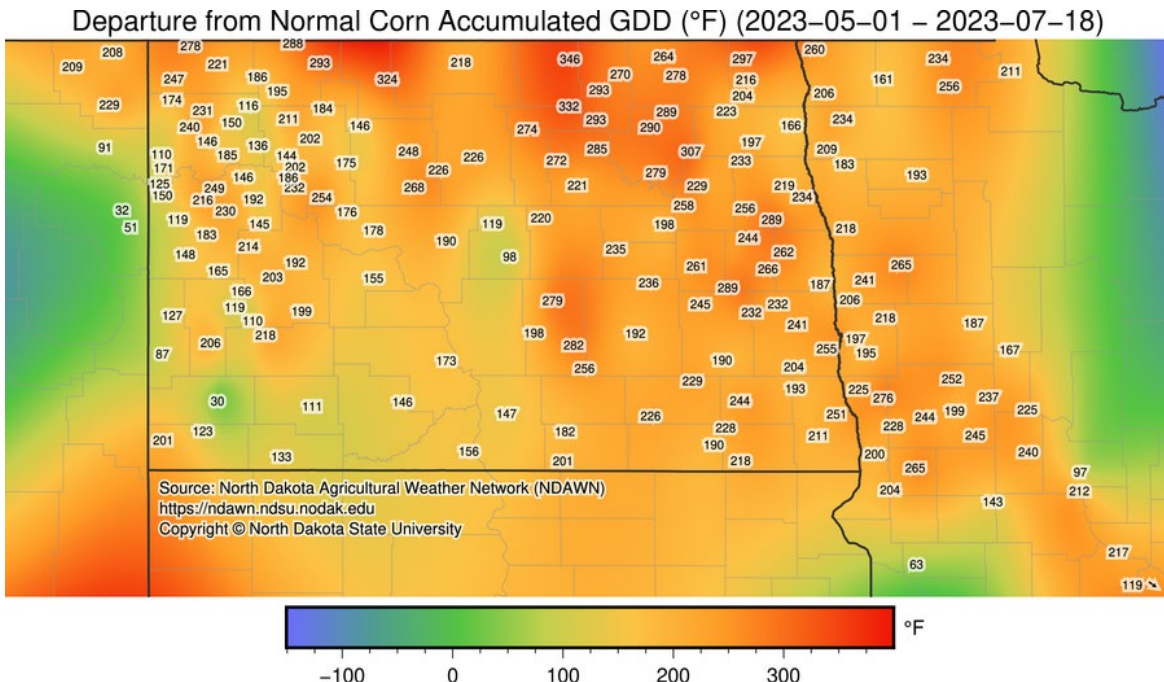


Figure 6. Growing degree days departure from normal for corn and soybean (base 50°F) from May 1 through July 18.

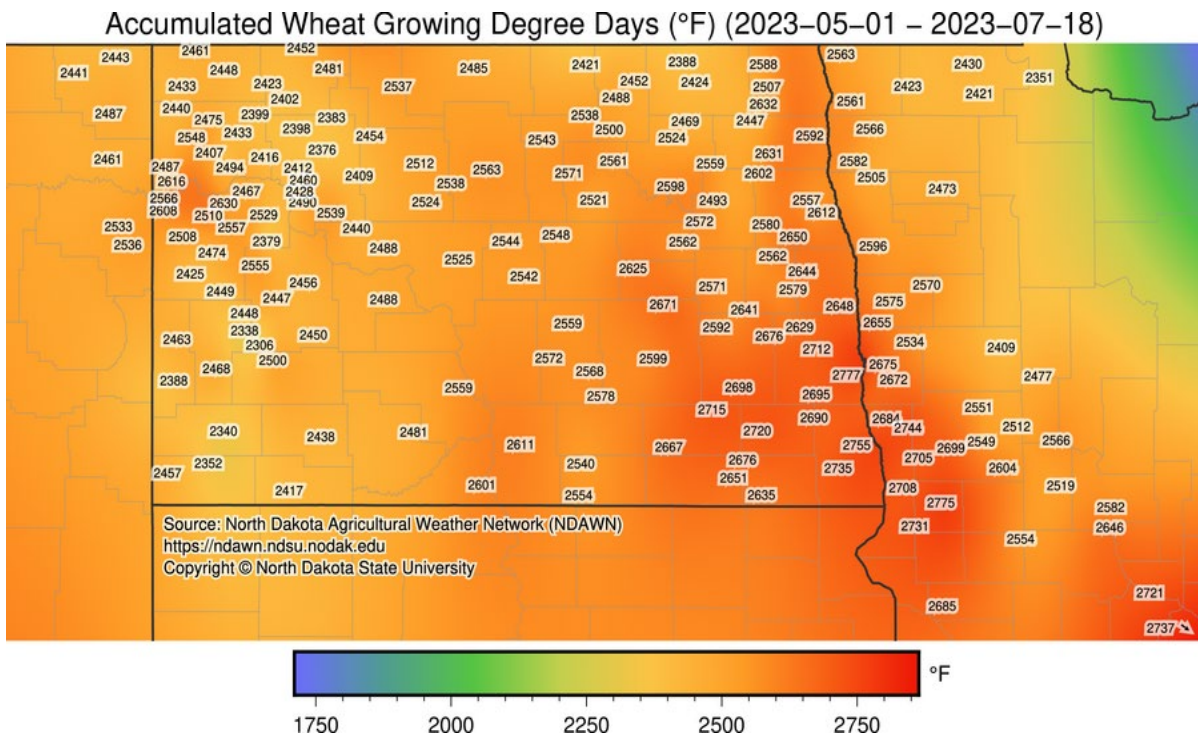


Figure 7. Accumulated growing degree days for wheat (base 32°F) from May 1 through July 18.

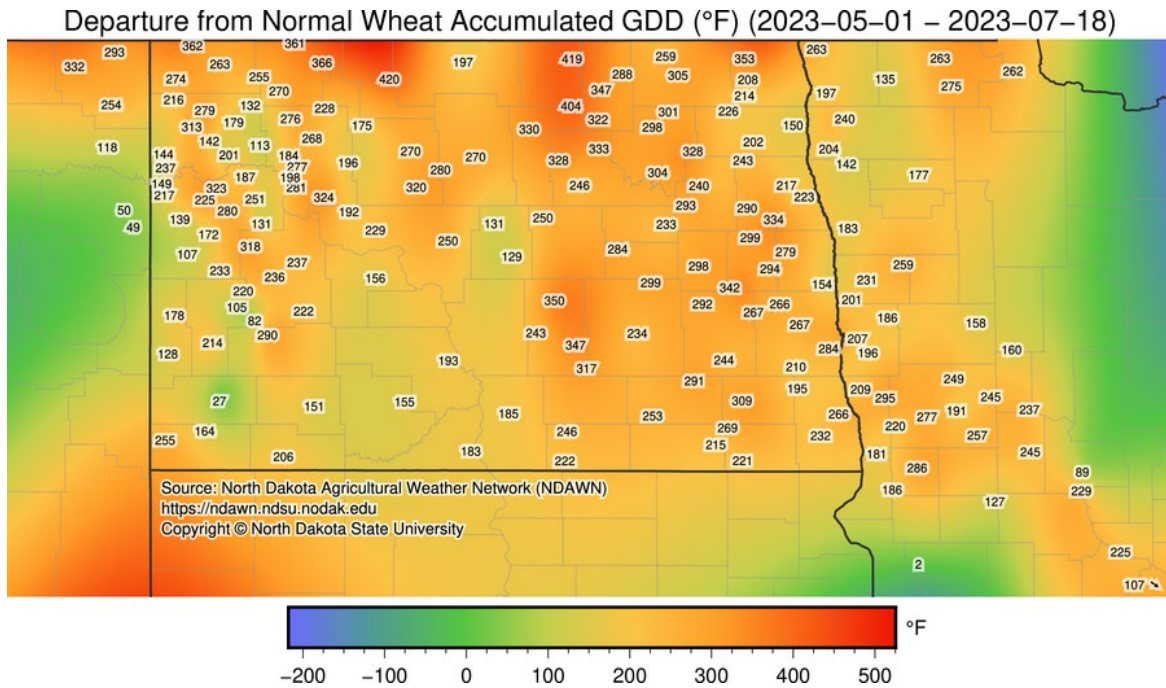


Figure 8. Growing degree days departure from normal for wheat (base 32°F) from May 1 through July 18.

Last week's drought monitor map indicated moderate (D1) drought conditions in northeastern and extreme northwestern ND, and abnormally dry conditions (D0) across much of eastern ND, and northwestern MN. More severe drought conditions exist in much of MN, WI, eastern SD, and the central Great Plains. Be sure to check [this week's drought monitor](#), which should be released on July 20. Looking at long-range forecast products, it looks like we're going to continue the trend of below normal precipitation, and temperatures are likely to warm above normal. Consequently, drought effects are likely to worsen. Public drought condition reporting is critical for drought monitors, especially during the growing season when conditions can change rapidly. Once again, I encourage our readers to participate in the [Condition Monitoring Observer Reports \(CMOR\)](#) system. Reports can be submitted using your desktop or laptop computer or through a smart device app. The website provides a [training video](#) and a [factsheet](#) on how to use the app. Reports should be submitted by noon each Monday. And I again encourage our readers to become [CoCoRaHS](#) weather observers.

The Week Ahead

Expect cooler to near normal temperatures through this Friday. This weekend, a high-pressure ridge is expected to move eastwards and park over the northern Great Plains. This will bring much warmer temperatures, with daytime highs in the 90's F across most of ND. I wouldn't be surprised to see a few readings over 100° F along the Missouri River and points west early next week. Precipitation chances appear to be low, and little rainfall is forecast for ND for the next 7 days (Figure 9). However, if the high-pressure ridge moves to our south, we could see shortwave troughs move around the northern boundary of the ridge, which would bring some thunderstorm potential across ND next week. If the ridge stays further north, thunderstorm potential will move north into Saskatchewan and Manitoba. The 6-10 day and 8-14-day outlooks show strong probabilities for above normal temperatures (Figures 10-11) and near normal precipitation (Figures 12-13).

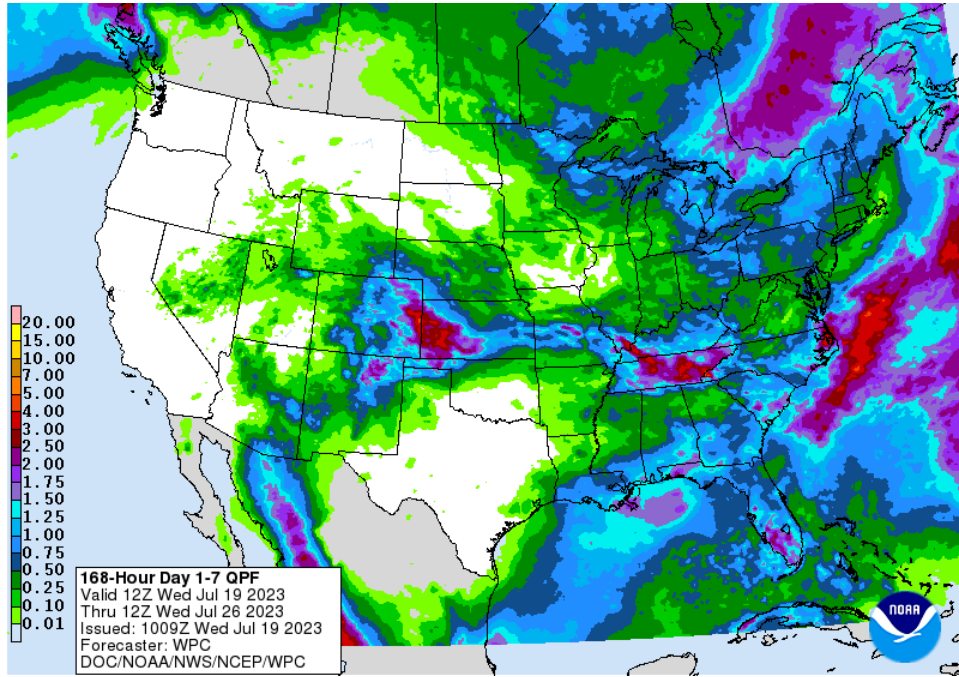


Figure 9. Precipitation forecast for the continental United States from 7:00 a.m. July 19 through 7:00 a.m. July 26.

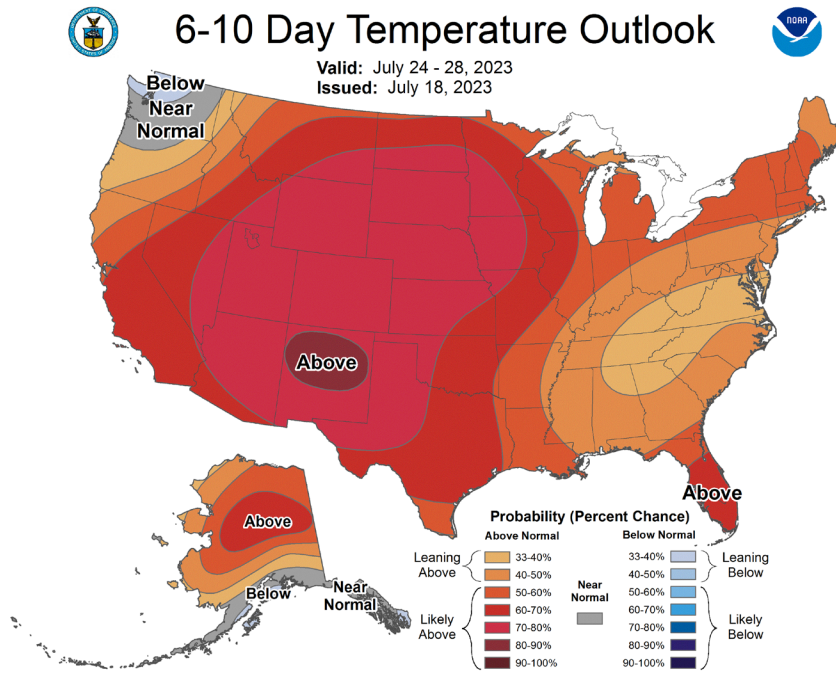


Figure 10. Temperature outlook for July 24 through July 28 for the continental United States and Alaska.



8-14 Day Temperature Outlook



Valid: July 26 - August 1, 2023
Issued: July 18, 2023

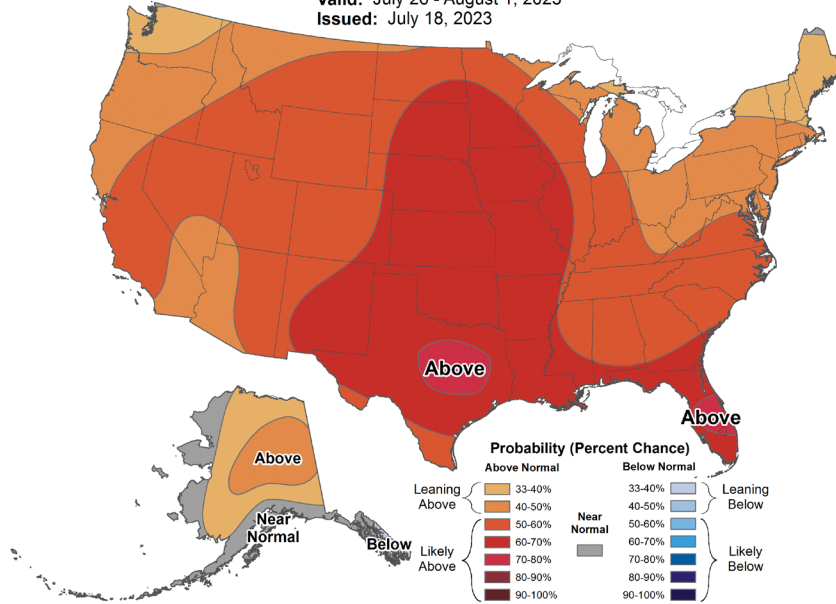


Figure 11. Temperature outlook for July 26 through August 1 for the continental United States and Alaska.



6-10 Day Precipitation Outlook



Valid: July 24 - 28, 2023
Issued: July 18, 2023

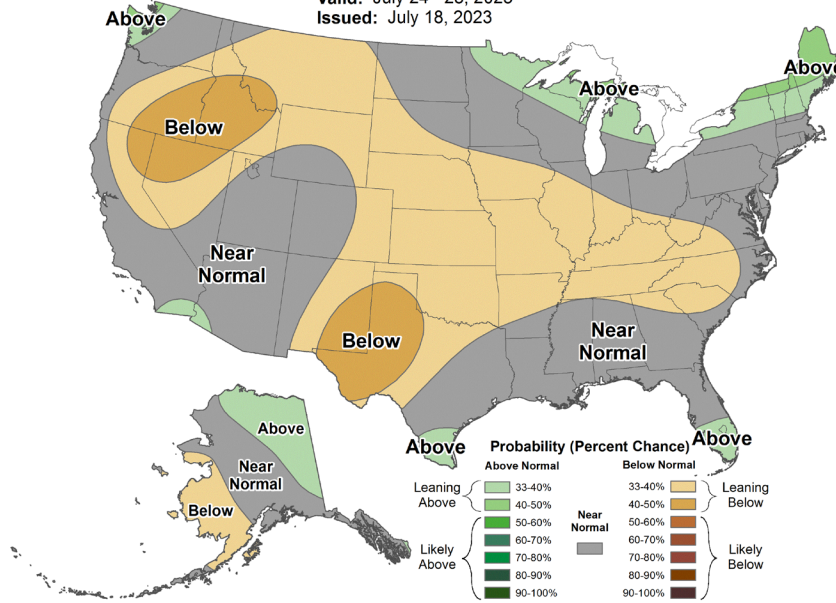


Figure 12. Precipitation outlook for July 24 through July 28 for the continental United States and Alaska.



8-14 Day Precipitation Outlook



Valid: July 26 - August 1, 2023
Issued: July 18, 2023

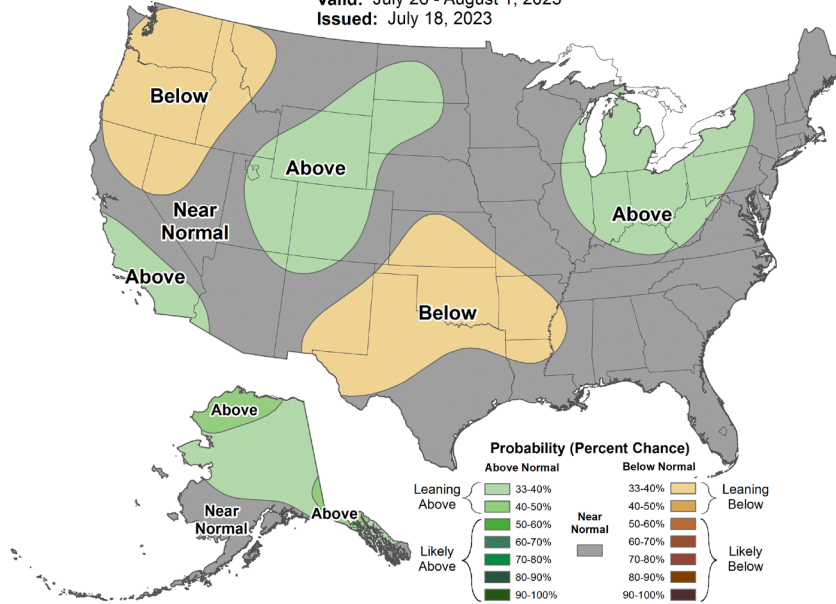


Figure 13. Precipitation outlook for July 26 through August 1 for the continental United States and Alaska.

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