

No. 9 July 7, 2023

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JOIN US AT THE NDSU FIELD DAYS!

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 11 – Hettinger Research Extension Center (5-7 p.m. MDT followed by supper)
- July 12 and 13 – Dickinson Research Extension Center
 - July 12 – Livestock tour at Manning Ranch (9 a.m.-noon MDT followed by lunch)
 - July 13 – Horticulture tour (9 a.m.-noon MDT followed by lunch), agronomy tour (1:30-5 p.m.)
- July 12 and 13 – Williston Research Extension Center
 - July 12 – Main site agronomy and horticulture (4-8 p.m. CDT)
 - July 13 – Irrigated tour – Nesson Valley Irrigation Research and Development farm, located 23 miles east of Williston on Highway 1804 (8:30 a.m.-Noon 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 TRAPPING 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** are low (<10 cumulative moths per trap per week) at all trap sites. For **diamondback moth**, traps counts are low in most canola production areas, but increasing in the north central canola production area. Scouting for diamondback moth is recommended in these areas with **high weekly trap catches of over 100 moths per trap per week**.

Scouting Tips for Diamondback moth: The newly hatched larva is light green and turns a darker green as it matures. Mature larvae are about ½ inch long. Larval feeding injury causes uneven maturity, aborted flowers, defoliation in leaves and direct feeding on pods. Critical scouting periods are during early flowering to mid-pod formation. Scout for larvae in the field by pulling all plants from a 1-square-foot area. Beat collected plants onto a clean surface or into a white bucket and then count the number of larvae dislodged from plants. Larvae often will dangle from canola plants on a silk thread. Repeat this procedure in at least five locations in the field to obtain an average of the number of larvae per square foot.



Diamondback moth larvae and leaf injury (A. Chirumamilla, LREC)

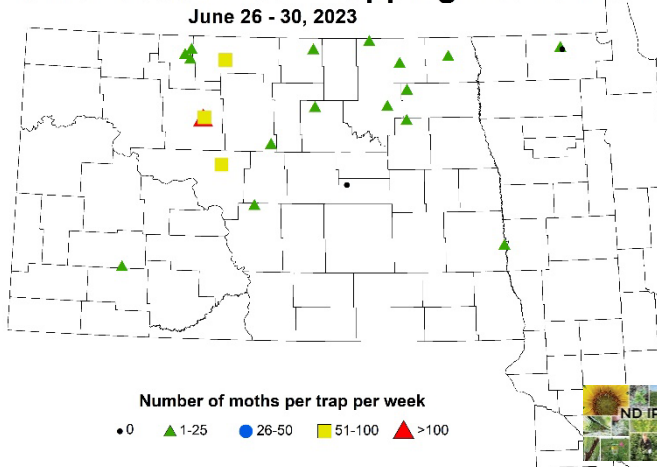
We will continue to report weekly trapping results for canola insects on the [IPM website](#) and the [NDSU Extension Crop & Pest Report](#). Thanks to Northern Canola Growers Association and the UDSA NIFA CPPM EIP for support.

Economic Thresholds for Diamondback Moth Larvae

- Flowering = 10 to 15 larvae per square foot
- Pod stages = 20 to 30 larvae per square foot

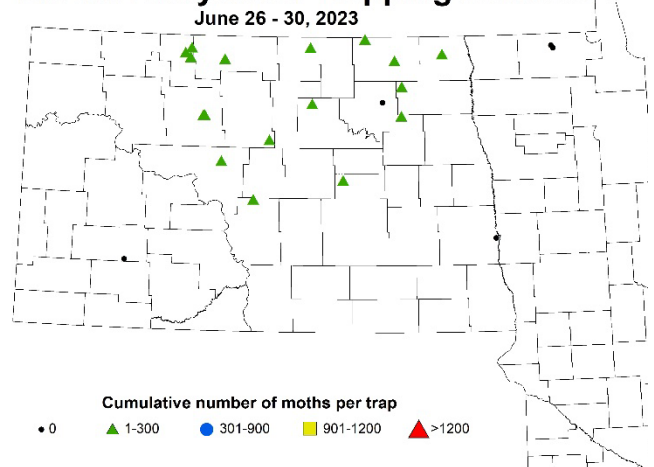
Diamondback Moth Trapping Network

June 26 - 30, 2023



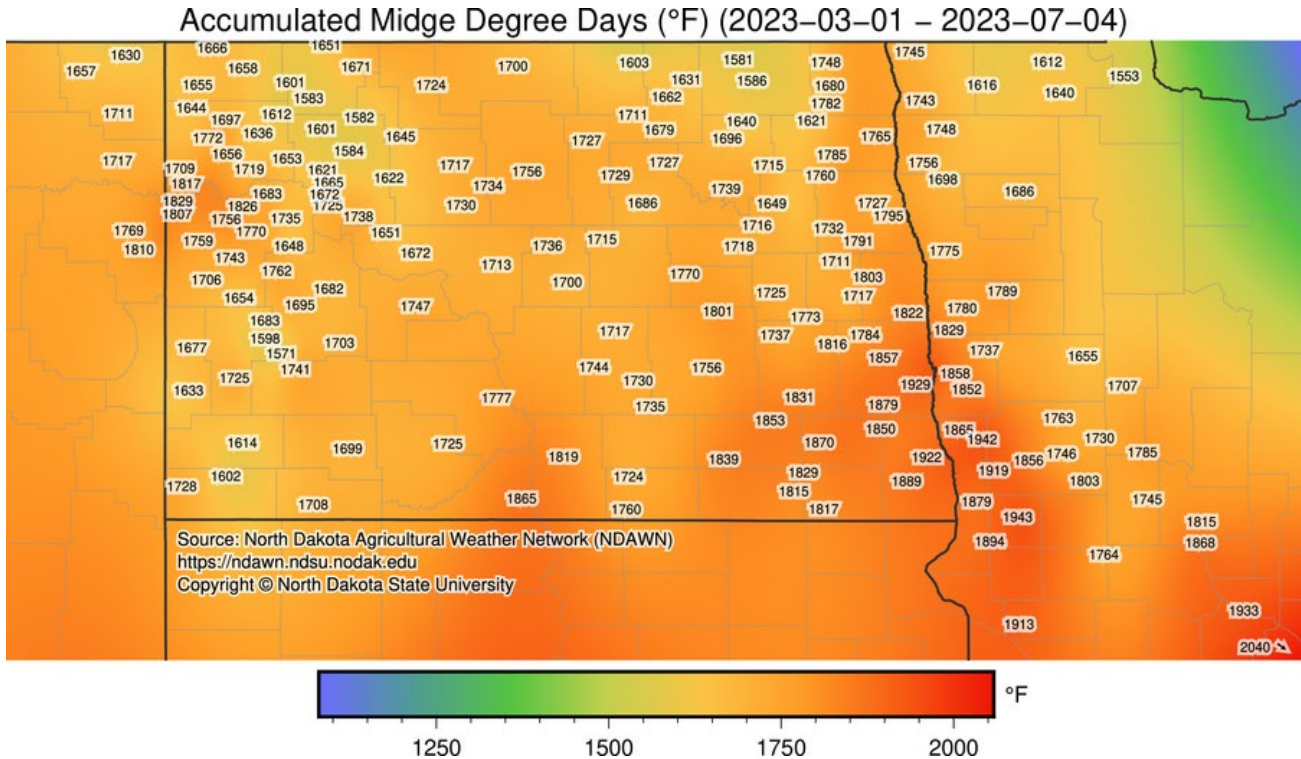
Bertha Armyworm Trapping Network

June 26 - 30, 2023



WHEAT MIDGE DEGREE DAYS & TRAP UPDATE

Female wheat midge is getting closer to the end of its emergence window of >1,600 Accumulated Degree Days (ADD). Since conditions have changed to cooler temperatures, fly longevity may be prolonged in some areas and in fields with no-till. See NDAWN wheat midge ADD map below. Scouting is critical up to the 1,800 ADD when wheat midge naturally die or 2,000 AGDD in no-till fields. Wheat is maturing quickly with the past heat and high temperatures above 90°F. **Wheat is susceptible to wheat midge infestation during the heading through the early flowering stages (30% flowering). Late spraying after mid-flowering (50% flowering) is NOT recommended since the parasitoids are active then and provide effective natural control of wheat midge eggs and larvae.**



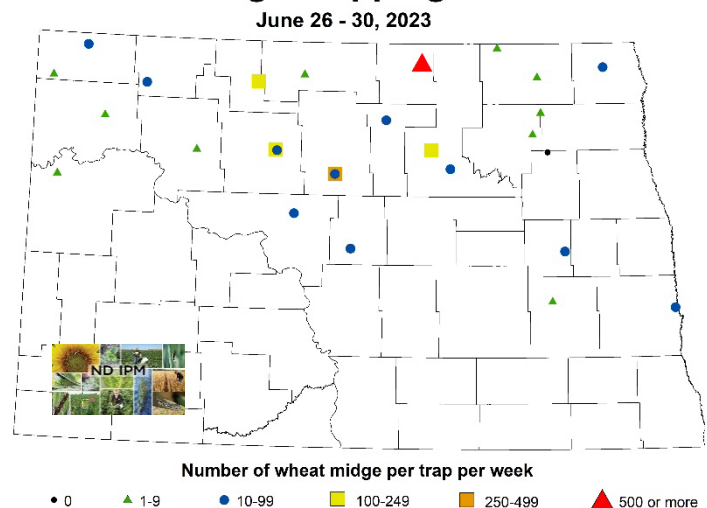
Wheat midge Trapping Update:

Overall, the trapping results for wheat midge indicate low trap catches (green triangle) to higher trap catches in the central and northern areas of the state. See NDSU Extension IPM map on right. We will continue to report weekly trapping results for wheat midge on the [IPM website](#) and the [NDSU Extension Crop & Pest Report](#).

Cumulative midge counts are also posted each week on the Montana State University [PestWeb System](#) for North Dakota and Montana at: <https://pestweb.montana.edu/Owbm/Home/Index>

Thanks to North Dakota Wheat Commission and the USDA NIFA CPPM EIP for support.

Wheat Midge Trapping Network



EUROPEAN CORN BORER TRAP UPDATE



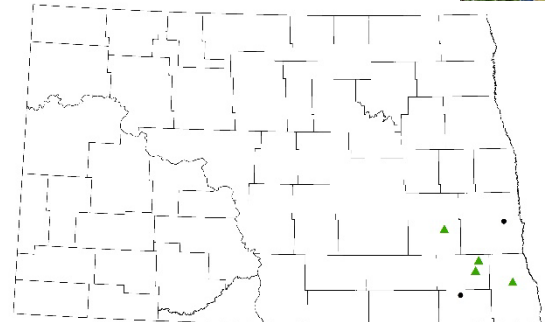
European corn borer moth
(*V. Calles Torrez*)

A modified Hartstack trap is being used for trapping ECB moths in grassy field ditches by corn fields. This past week, Z-race ECB moths increased at Gwinner (Sargent County), Shenford (Ransom County), and Antelope (Richland County), and the first trapping of Z-race ECB moth occurred at Mapleton, Cass County. The E-race ECB moth has not been detected in traps yet.

We will continue to report weekly trapping results for European corn borer moths on the [IPM website](#) and the [NDSU Extension Crop & Pest Report](#). Thanks to the support of the North Dakota Corn Council.

European Corn Borer Trapping
Iowa (or Z-race)

June 27 - July 3, 2023



Total number of moths per trap per corn field

• 0 ▲ 0.1-50 ● 50.1-100 ■ 100.1-200 ▲ > 200

Table 1. 2023 pheromone trap catches for European corn borer (ECB) moths in corn, ND

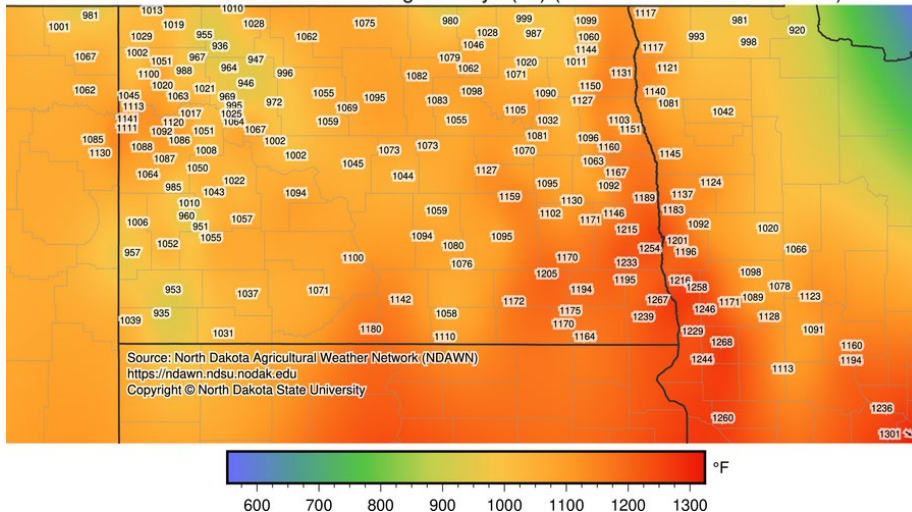
Area	County	Nearest town	ECB Z-race moths				ECB E-race moths			
			June 13-19	June 20-26	June 27-July 3	Total trap	June 13-19	June 20-26	June 27-July 3	Total trap
EC	Barnes	Cuba	0	0	0	0	0	0	0	0
EC	Cass	Mapleton	0	0	1	1	0	0	0	0
SE	Sargent	Gwinner	0	1	27	28	0	0	0	0
SE	Ransom	Shenford	0	14	47	61	0	0	0	0
SE	Ransom	Sheldon	0	0	0	0	0	0	0	0
SE	Richland	Antelope	0	1	7	8	0	0	0	0
Total moths			0	16	82	98	0	0	0	0

Degree Days for Univoltine ECB moth: The accumulated degree days (ADD) indicate a range from about 950 ADD (25% moths emerged) in the northern half of North Dakota to 1239 ADD (<90% moths emerged) in southeastern North Dakota (see Table 1 and map). Scouting is critical for areas with more than 50% of moth emerged.

Table 1. Degree Day Model for Univoltine ECB Ecotype (base temperature of 50° F)

Accumulate Degree Days	Proportion of Emerged Moths
911	10%
986	25%
1078	50%
1177	75%
1274	90%

Accumulated Base 50 Insect Degree Days (°F) (2023-03-01 – 2023-07-05)



Source: North Dakota Agricultural Weather Network (NDAWN)
<https://ndawn.ndsu.nodak.edu>
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Janet J. Knodel
Extension Entomologist

HESSIAN FLY IN WHEAT

Hessian fly (*Mayetiola destructor*) is an invasive insect that was introduced into North America in 1779 by the Hessian soldiers' encampment in New York. Hessian fly prefers wheat but also survives on barley and rye. Presence of this insect in North Dakota is common but severe infestations have been noted only in a few years. Last year, fields with notable damage from this insect have been reported in the eastern part of ND. Adult flies are small (< 1/8-inch), dark colored resembling a mosquito. Females lay red colored eggs in the grooves of the leaves. Larvae hatch and move to the base of the stem hiding in the leaf sheath and feed on the sap from the stem. Feeding damage early in the spring causes stunting of the plants but at later growth stages causes weakening of the stem and lodging. The fly overwinters as matured larvae encapsuled in a brown case (flaxseed) in the wheat stubble.



Hessian fly adult on left and larvae on right (Kansas State University)

Hessian fly infestation was observed in a wheat field in Cavalier County this week. Wheat is at the jointing stage pushing towards the boot stage. The infested plants are notably stunted compared to the healthy plants. Careful observation of the plants by peeling the leaf sheaths to the base of the plant revealed the brown flaxseed larvae (puparia) close to the soil level. Mature white larvae were also seen in some plants. This notes that the fly has completed one generation with the first-generation flies emerging in late April to mid-May and laying eggs on spring wheat. Eggs hatch into white-clear



Hessian Fly infested stunted rows of wheat plants (A. Chirumamilla, LREC)



Hessian fly larvae in the flaxseed stage found at the base of the plant near soil level (A. Chirumamilla, LREC)

larvae that fed all through May and June. The second-generation adults will be emerging soon that will mate and start laying eggs in wheat as wheat starts heading. Larval feeding damage at this stage is not noticed until the harvest as the wheat starts lodging right above the first node.



Hessian Fly infested wheat field with lodged stems and flaxseed larvae hidden between the leaf sheath and stem (A. Chirumamilla, LREC)

The IPM Crop Survey Program received funding from the ND Wheat Commission to survey the distribution of this insect in North Dakota. Pheromone traps are being set up to monitor the adult fly activity. The information will be available on the [IPM Wheat Insect Trapping](#) website.

Pest management for Hessian fly includes:

- Crop rotation with non-susceptible hosts (e.g. soybeans, corn, oats, canola, sunflowers, dry beans, field peas and flax)
- Burying the wheat stubble and volunteer wheat through tillage helps destroy the overwintering generation.
- Using resistant varieties in high infested areas (Guard and Shield from South Dakota). It is unknown if current wheat varieties of North Dakota and Minnesota are resistant to Hessian flies. We expected that they are susceptible to Hessian fly.
- Insecticide seed treatments to protect the spring-planted hard red spring / durum wheats from the overwintering spring population of Hessian flies and fall-planted winter wheat from the last generation of Hessian flies are available.
- Warrior II is labelled for foliar application but usually not recommended because of low population levels and also due to lack of data that predicts the peak adult emergence.

Anitha Chirumamilla

Extension Cropping Systems Specialist
Langdon Research Extension Center

Janet J. Knodel

Extension Entomologist



plant pathology

WHITE MOLD RISK IN CANOLA

Risk of white mold development in canola is currently mixed, depending on the location in the state. Since this time last week, the risk map has reported lower risk in northern half of the growing region, but remains high in south central and southwest North Dakota. The Sclerotinia Risk Map and Risk Calculator are available at the [NDSU Canola Pathology program](#) or through the [Northern Canola Growers Association](#) and [Minnesota Canola Council](#) websites. We thank them for their support of the canola pathology program!

We recommend canola growers consider using the Risk Map and associated Risk Calculator to help make decisions about potential management options for white mold as canola enters bloom. Additionally, as the risk map uses precipitation and temperature as main predictors, the map is also helpful for those growing other white-mold sensitive crops.

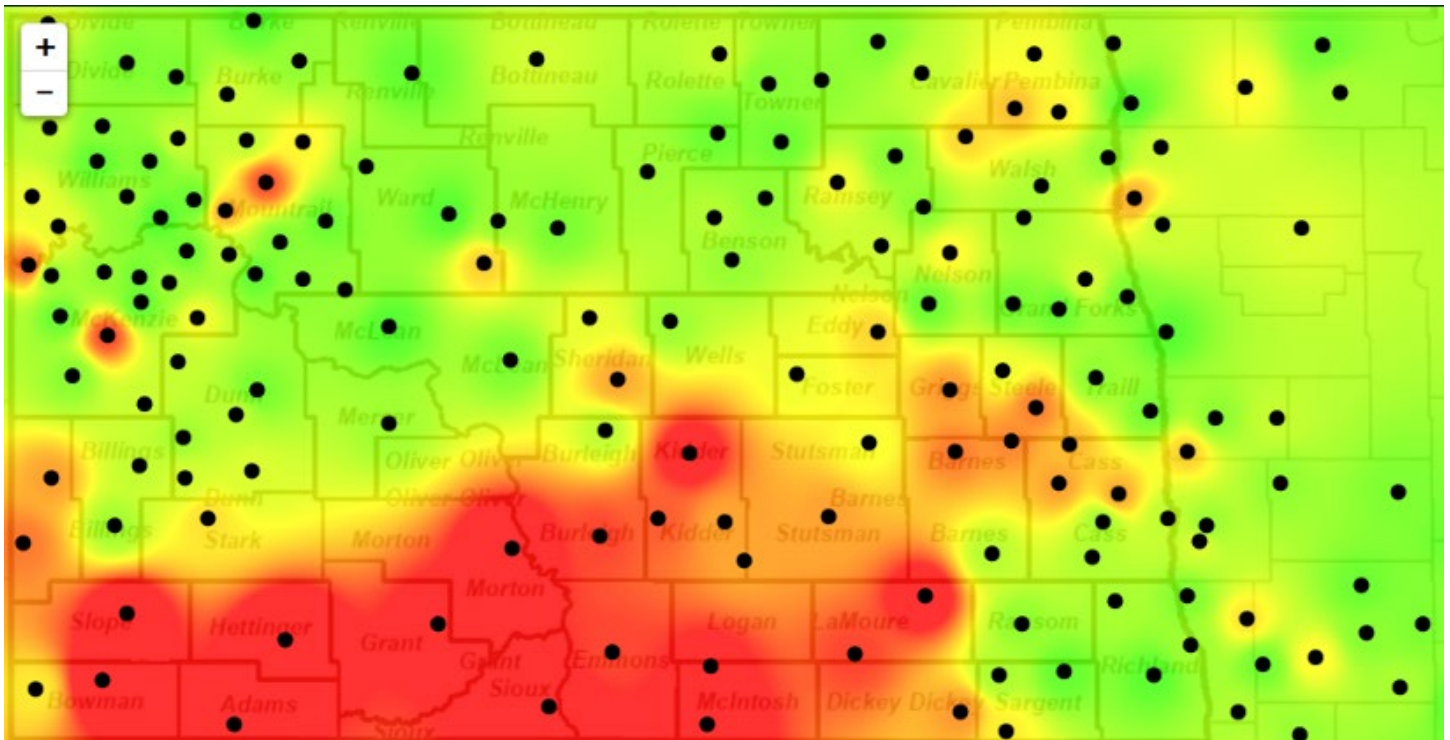


Figure 1. Estimated risk of Sclerotinia stem rot development for 7/5/23. The color-coded Risk Map is designed to estimate risk of white mold development; low (green), moderate (yellow) and high (red).

[Sam Markell](#)

Extension Plant Pathologist, Broad-leaf Crops

[Luis del Rio Mendoza](#)

Professor, Canola Pathologist

FUSARIUM HEAD BLIGHT (SCAB) RISK – UPDATE

Scab risk for susceptible varieties continues to remain high for several areas in North Dakota, including southwest ND and several areas in eastern ND (Figure 1). This elevated scab risk is the result of frequent rainfall, higher relative humidity, and prolonged dews over the past 7 to 10 days. Scab risk for moderately resistant varieties is low for most of the state except for a few moderate risk pockets in southwest and southeast ND (Figure 2). Heading and flowering dates for wheat vary across the state this year, so make sure to evaluate weather conditions (both past and future) and use the scab risk models to estimate risk in a given field as it approaches flowering.

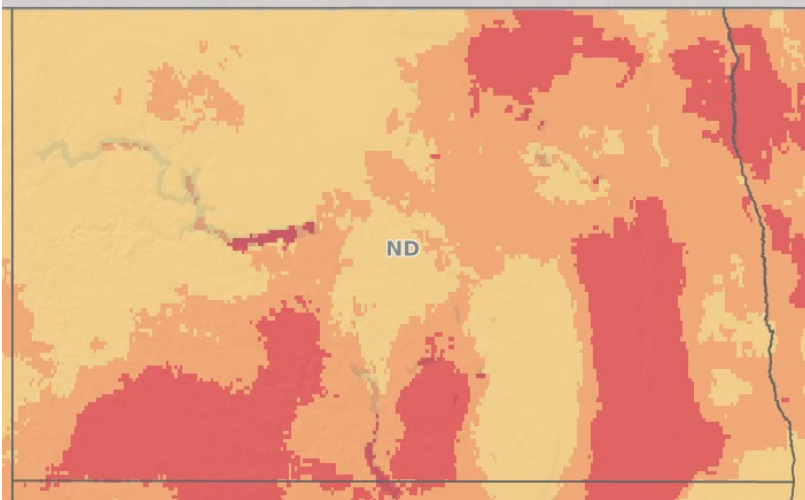


Figure 1. Scab risk for susceptible varieties on July 5 according to the National Fusarium Risk Tool (USWBSI funded). Orange indicates moderate risk and red indicates high risk

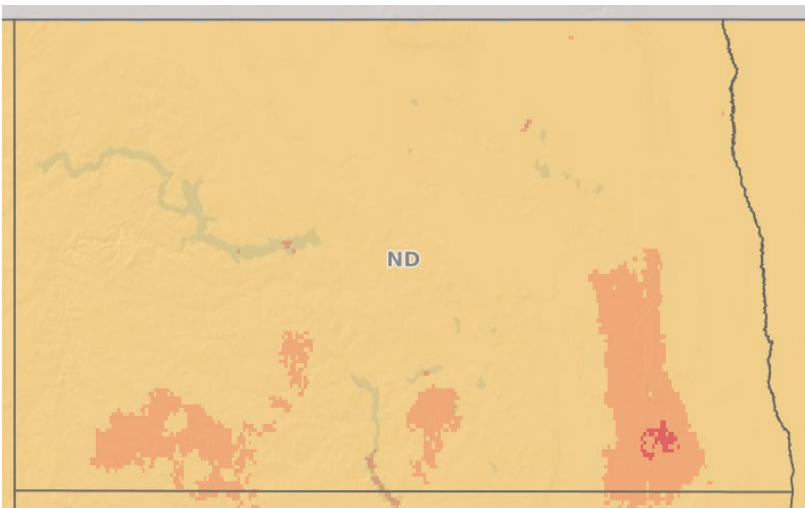


Figure 2. Scab risk for moderately resistant varieties on July 5 according to the National Fusarium Risk Tool (USWBSI funded). Orange indicates moderate risk and red indicates high risk.

[Andrew Friskop](#)

Extension Plant Pathology, Cereal Crops



CROPS ARE GROWING QUICKLY, MAKE SURE YOU KNOW YOUR GROWTH STAGES

After the long holiday weekend and much-needed rain, crops in eastern ND are growing quickly. Corn planted on May 20th at Prosper ND is 4-5 feet tall and V11-V13, see included photo. Fast growth followed by high winds is a recipe for greensnap or brittle snap, i.e., breaking of the stems caused by strong winds during or soon after periods of rapid growth. Greensnap happens because the rapidly growing and elongating cells of the corn stalks don't have the time they need to harden off and become stiff before damaging winds occur. Corn growers and crop scouts are advised to be on the look out for greensnap and make note of any hybrids that seem particularly susceptible to it. Consider scores for resistance to greensnap when making hybrid selections for future seasons.



Dr. Clair Keene, NDSU corn and small grain extension agronomist standing in corn research plots at Prosper, ND on July 5, 2023.

Small grain development is generally ahead of schedule though it is hard to generalize because of the wide variability in planting date. Earlier planted fields are heading out to flowering and growers are advised to keep an eye on local environmental conditions. For more information see Andrew Friskop's article on Page 8.

[Clair Keene](#)
Extension Agronomist Small Grains and Corn



around the state

AROUND THE STATE

NORTHEAST ND

The northeast region of ND continues its dry spell with very little to no rain received in the last week. Apart from the areas that received heavy rainfall 10 days back, conditions still remain dry to very dry impacting crop development and livestock water supplies. Crops are advancing fast with small grains heading and flowering while soybeans, field peas and canola are entering into flowering and pod development phases. IDC symptoms continue to show in soybeans. The risk

of scab in small grains continues to be low to medium in moderately susceptible to susceptible varieties. For more information see Andrew Friskop’s article on Page 8.



Grasshopper feeding damage on soybeans (A. Chirumamilla, LREC)

this week’s C & P report. Grasshopper populations are slowly increasing and the nymphs are becoming big. If the grasshopper populations tend to stay on the field edges, spraying the border rows would help prevent them from moving into the crop.

Bacterial leaf streak has been reported from Pembina County. Remember that there is no spray to control this disease. Choosing resistant varieties is the best available option. Cereal aphid and thrip activity are increasing in barley and wheat. Keep scouting for their numbers before making spray decisions. Hessian fly infestation has been noticed in a spring wheat field in Cavalier county. The wheat plants are visibly stunted compared to the healthy plants. Careful peeling off the leaves exposed the mature hessian fly larvae and flaxseed puparia at the base of the plant near the soil level. More details on this insect were discussed in a separate article in the Entomology section of



IDC in soybeans in Towner County (A. Chirumamilla, LREC)



Field Pea at flowering and pod forming stage
(A. Chirumamilla, LREC)



Canola at flowering and pod forming stage
(A. Chirumamilla, LREC)

[Anitha Chirumamilla](#)

Extension Cropping Systems Specialist
Langdon Research Extension Center

NORTHWEST ND

It has been mostly hot and dry during the past week in northwest ND. NDAWN weather stations across the five northwestern counties recorded daytime maximum air temperatures in the upper 80's (°F) to mid-90s (°F) and nighttime air temperatures in the mid 50's to low 60's (°F) with very few scattered rain events from June 26 to July 2. For instance, Hofflund and Dry Fork in Williams county area received 0.43 and 0.77 inches of rain, respectively, on June 26 but the rest of northwest received very little (0.01 inches) to none on that same day. However, from June 30th through July 3rd, scattered and patchy rain downpours (0.11 to 0.44 inches) happened mostly in McKenzie county and some areas in Williams and Mountrail counties. In the same time span, small precipitation events to none happened in Divide and Burke counties. Overall, most of the northwest are in dry and droughty conditions with top soils mostly dry and hard. Precipitation is desperately needed especially in rain-deprived areas where a small grain or a broadleaf crops are flowering.

Crop growth stages in a wide range but we've seen flowering stage in our small grains, up V12 in irrigated corn, up to V9 in dryland corn, up to R1 in irrigated soybean, flowering to early capsule formation in flax, flowering to pod formation in chickpea, flowering to flat pods in lentil, flowering to early pod formation in canola and mustard, and up to R4 (full pod) in field pea. Wheat midge was detected through insect trapping efforts. Wheat midge counts from insect traps set across the northwest counties number mostly from 0 to 10, however, an insect trap in Burke county yielded 57 wheat midges. Although the late planting of wheat this year may not coincide with peak emergence of this insect pest, it is however important to scout wheat fields especially at heading and early flowering stage when the wheat is most susceptible. Economic thresholds for control (usually by using an insecticide) of the insect pest in hard red spring wheat is one or more midge observed for every four or five heads, and one or more midge observed for every seven or eight



Soybean at R1 stage in an irrigated field southwest of Williams county close to the Montana border.



Hard red spring wheat at flowering stage in Williams county.



Flax at late flowering, early branching and capsule formation in Williams county.



Lentil at flat pod stage at the NDSU Williston Research Extension Center.



Corn approximately 7 ft. tall and growing well under linear irrigation. Photo taken on June 30 west of McKenzie county by the Missouri river.



Dryland corn showing leaf rolling symptoms in response to hot and droughty conditions. Photo taken on June 30 in McKenzie county.



An adult wheat stem sawfly found in a wheat field in Divide county.

heads in durum. For more information, please see Dr. Knodel's article on Page 3 or visit the NDSU Extension Publication found [here](#). IPM Scouting efforts yielded detection of a few incidences of tan spot in wheat fields in Williams and Mountrail counties, and a lot of wheat stem sawfly and loose smut detection in wheat fields in Divide and Williams counties.

[Charlemagne "Charlie" Lim](#)

Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

According to NDAWN, rain received in this region during the past week (June 28-July 4) ranges from 0.1 inch (Harvey) to 1.5 inch (Cooperstown), with the Carrington Research Extension Center (CREC) receiving 0.3 inch. During June 28-July 4, average daily water use (date of plant emergence in parenthesis): spring wheat (May 15) = 0.3 inch; and corn (May 20) = 0.2 inch; and soybean (June 1) = 0.15 inch.

Crop stages of CREC variety or hybrid performance trials: winter rye and winter wheat at dough to near seed maturity; early May seeded barley and spring wheat at early seed development; mid-May planted corn beginning to tassel (VT); last full week of May planted soybean at full flower (R2) and dry bean at bud to start of flowering (R1).



Corn beginning VT stage (planted May 12)



Dry bean at R1 stage (planted May 25)

The CREC's living weed exhibit is available for viewing. Over 60 weed species are arranged according to life cycle, plus a row contains North Dakota's state noxious weeds.



[Greg Endres](#)

Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center



WEATHER FORECAST

The Week in Review

Average daily air temperatures trended below normal for the past week (Figure 1). Several western NDAWN stations recorded overnight lows in the 30s F on the morning of July 5, including a 33°F reading at Poker Jim in McKenzie County! I wouldn't be surprised if there were brief pockets of light frost in some low-lying areas. Low temperature departures from normal for July 5 are depicted in Figure 2. Rainfall totals for the past week trended below normal (Figure 3), with the highest amounts occurring in southwestern ND (Figure 4).

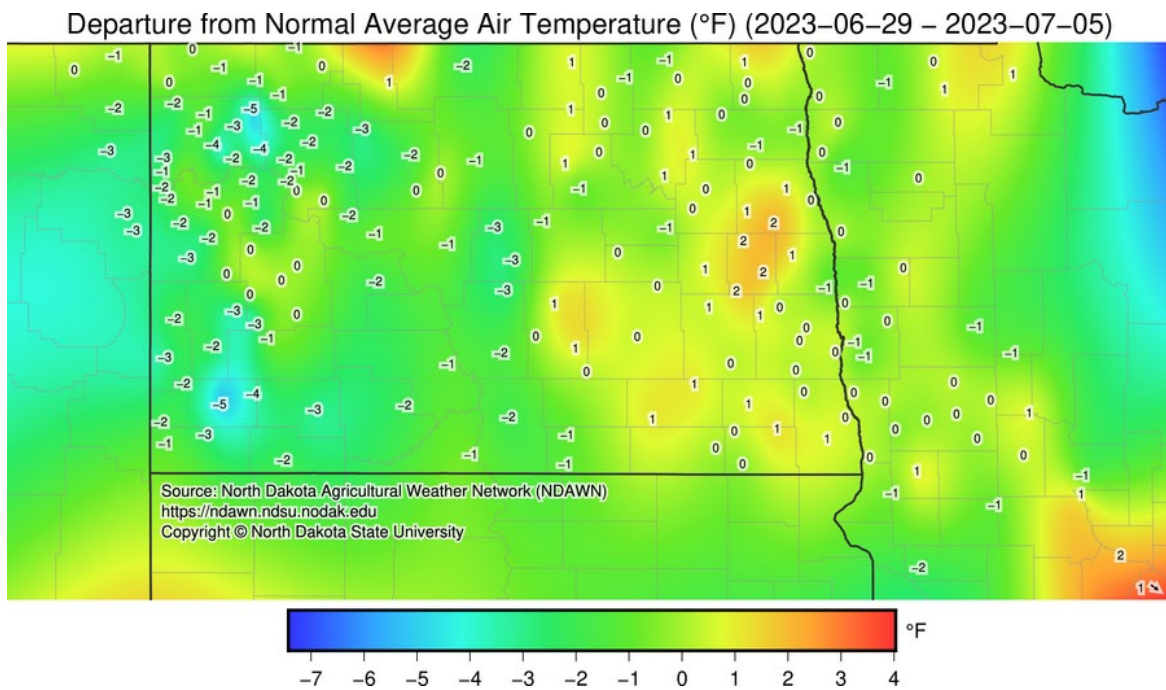


Figure 1. Average air temperature departure from normal from June 29 through July 5.

Departure from Normal Minimum Air Temperature (°F) (2023-07-05)

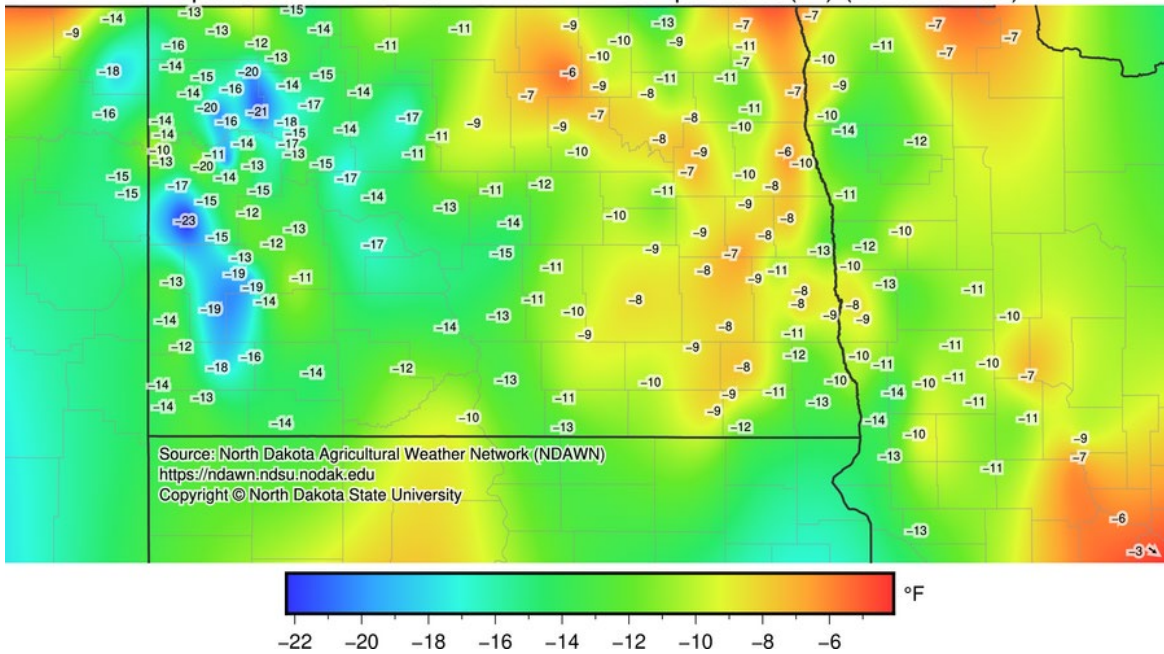


Figure 2. Minimum air temperature departure from normal for July 5.

Departure from Normal Rainfall (inch) (2023-06-29 – 2023-07-05)

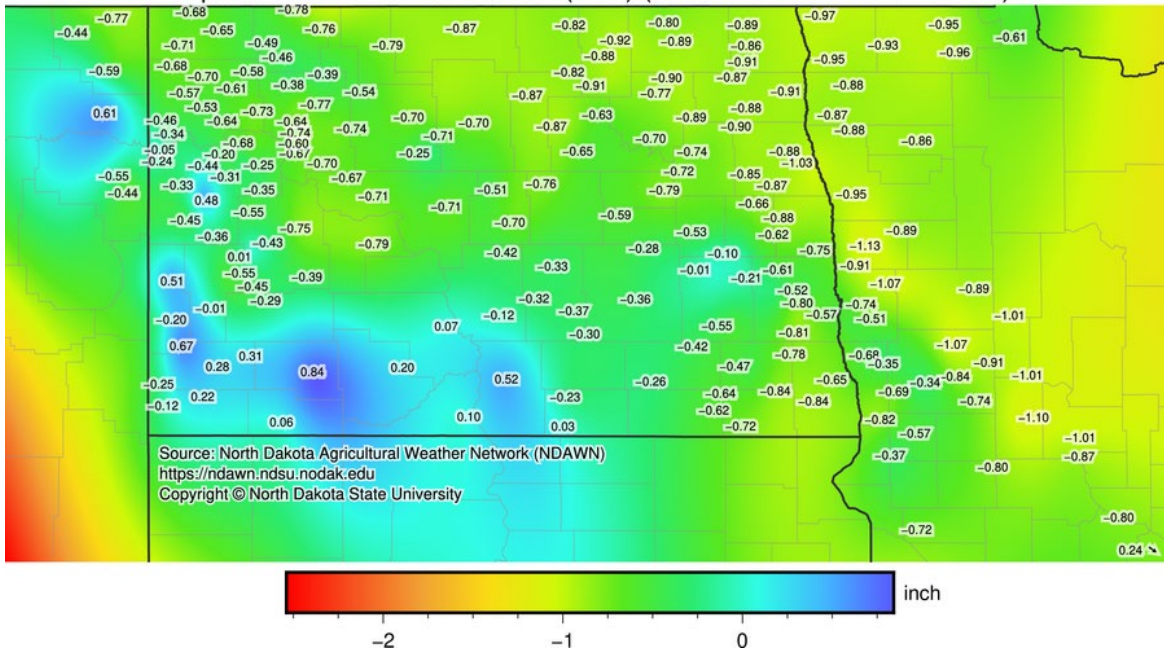


Figure 3. Rainfall departure from normal for June 29 through July 5.

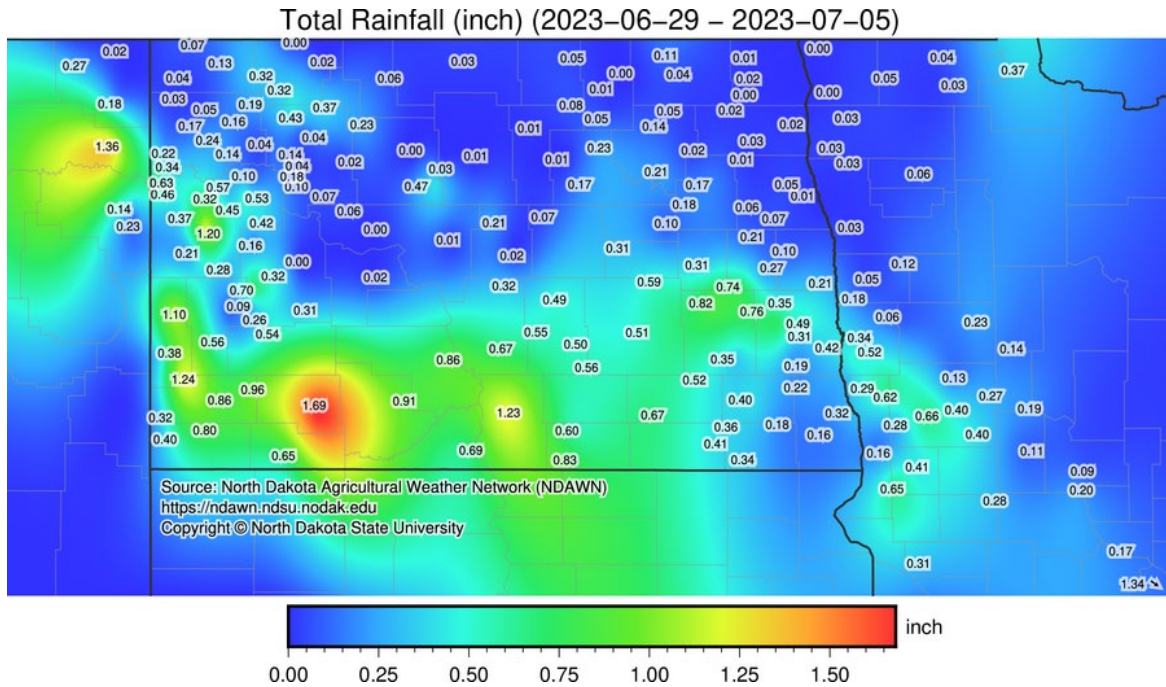


Figure 4. Total rainfall from June 29 through July 5.

Soil moisture at the 4-inch and 8-inch depths (Figures 5 and 6) show deficits mainly in northwestern ND and north of I-94, with optimum to excess moisture mainly south of I-94 and several locations in eastern ND. The [current drought monitor](#) released on July 6 shows D1 (moderate drought) in extreme northeastern ND, and D0 (abnormally dry) in eastern ND along and east of the Missouri Coteau and also in extreme northwestern ND (Figure 7). Much more severe drought conditions exist in parts of MN, IA, IL, IN, KS, MO, NE, and WI. I'd like to again 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. Public drought condition reporting is critical for drought monitors, especially during the growing season when conditions can change rapidly.

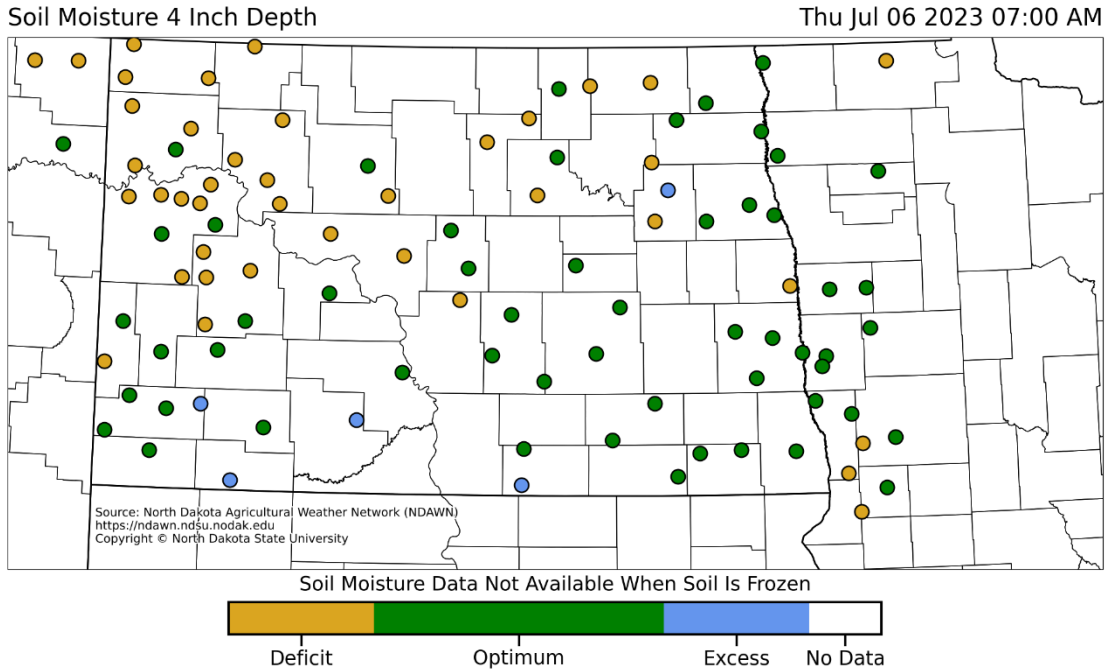


Figure 5. Soil moisture at the 4-inch depth as of 7:00 a.m. on July 6.

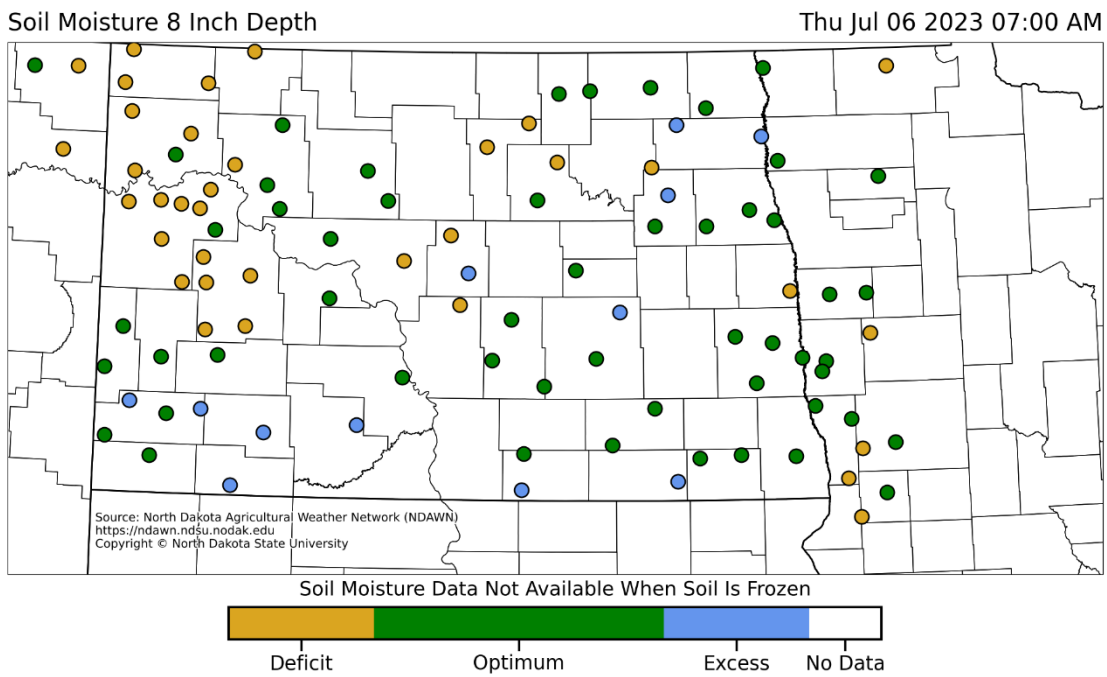


Figure 6. Soil moisture at the 8-inch depth as of 7:00 a.m. on July 6.

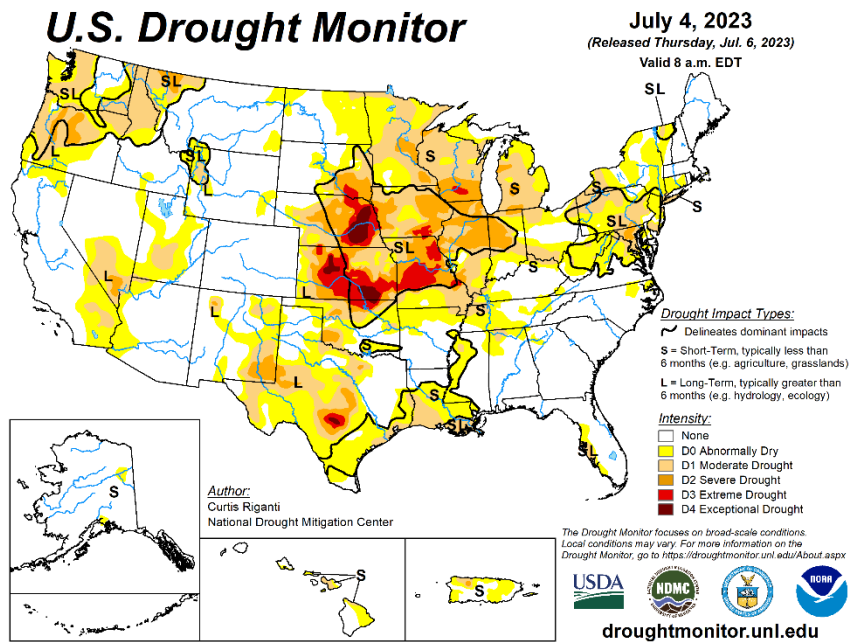


Figure 7. Drought conditions for the United States as of July 4.

Statewide accumulated growing degree days (GDD) and GDD departures from normal for corn/soybean and wheat beginning May 1 are depicted in Figures 8-11. **For the most accurate GDD accumulations for your crops and your locations**, use the main [NDAWN](https://ndawn.ndsu.edu) website. Go to 'Applications', select your crop GDD model, select the nearest NDAWN station from the station list, select any departures from normal, 5-year average, or compare with a previous year, enter your planting date, and select 'Get Table'. The resulting table will give you daily GDD and accumulated DD, plus any departures and previous year comparisons you selected.

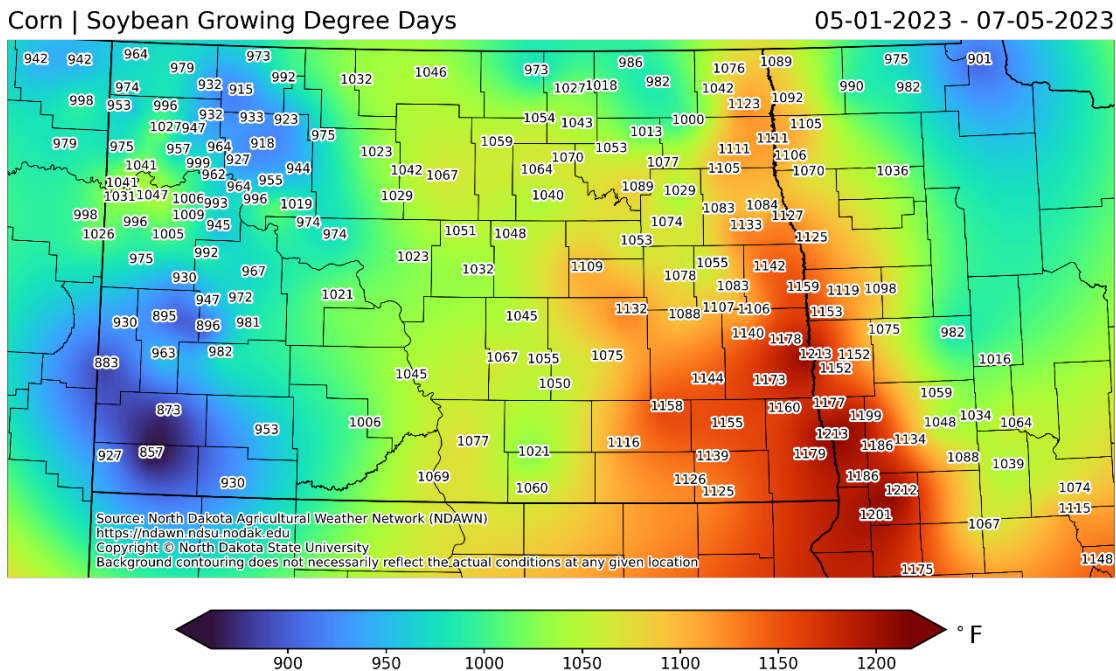


Figure 8. Corn and soybean growing degree days (base 50°F) from May 1 through July 5.

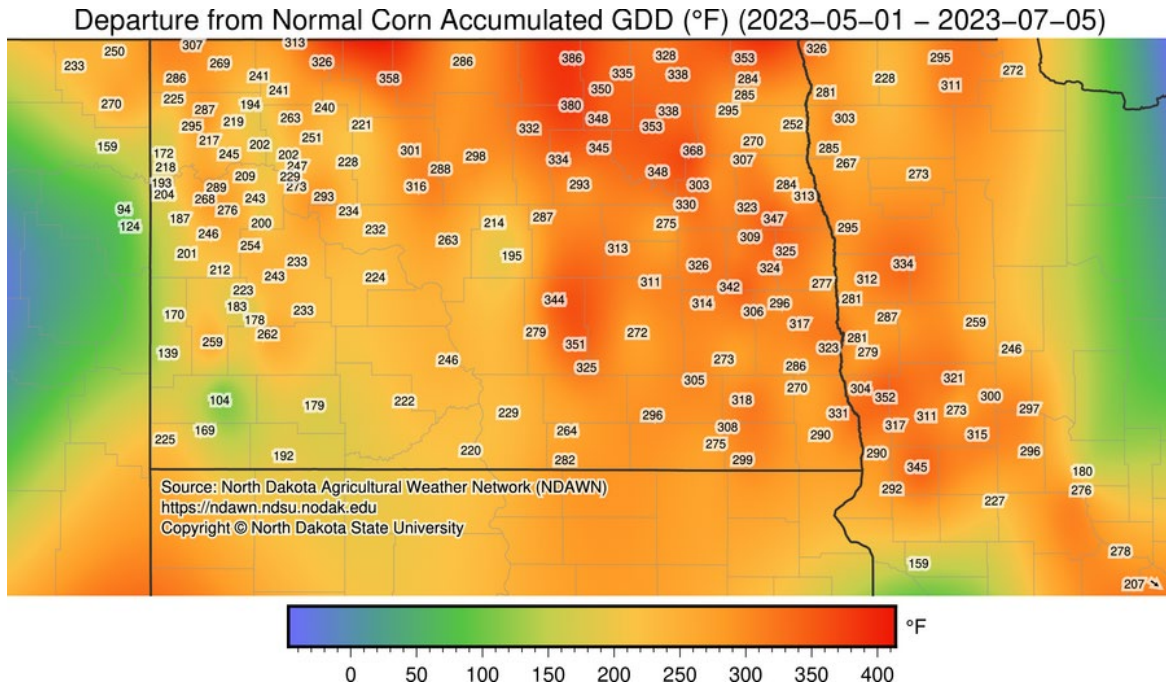


Figure 9. Corn and soybean growing degree days departure from normal from May 1 through July 5.

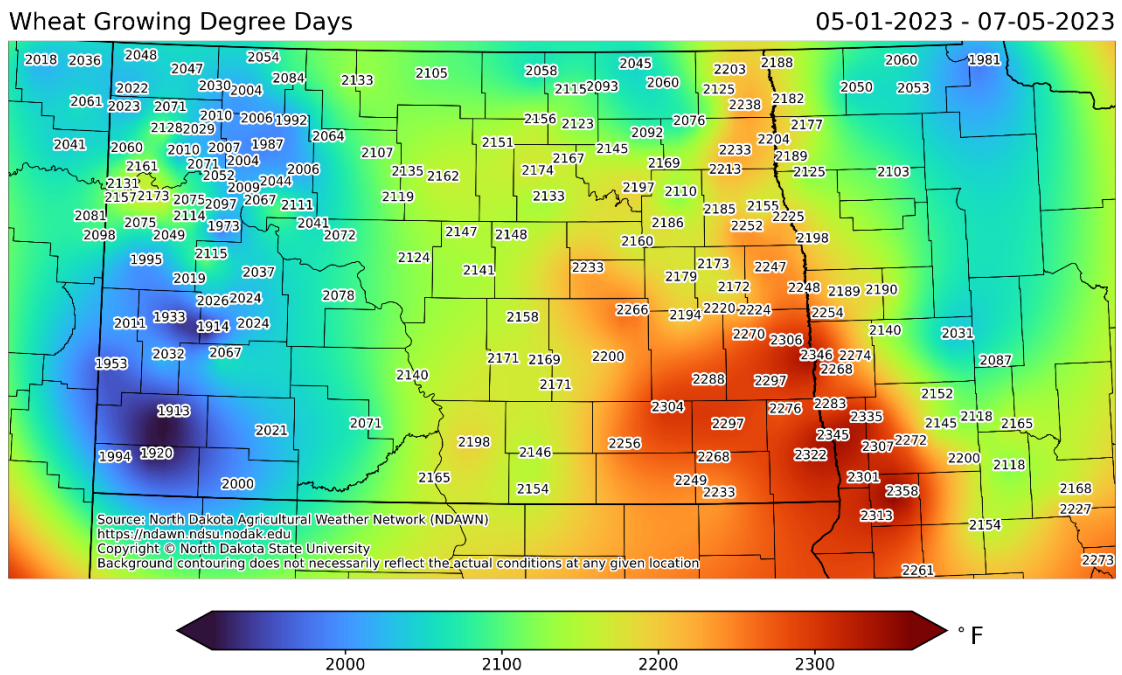


Figure 10. Wheat growing degree days (base 32°F) from May 1 through July 5.

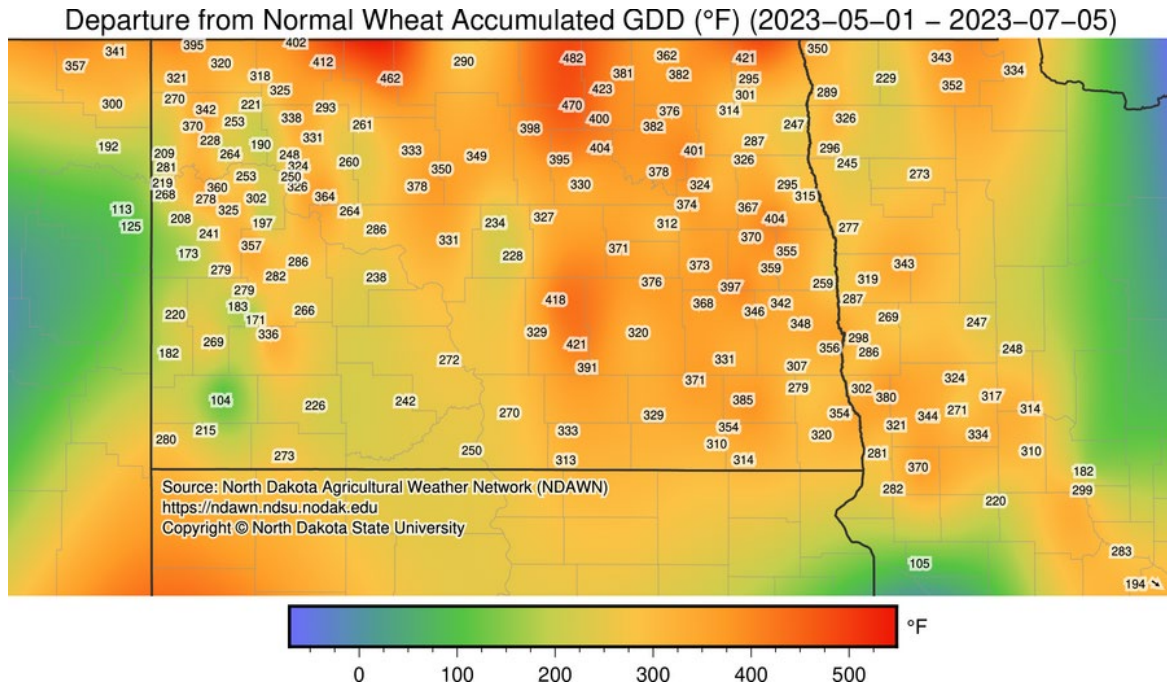


Figure 11. Wheat growing degree days departure from normal from May 1 through July 5.

The Week Ahead

Currently, we have a high pressure ridge to our west and a low pressure trough that’s more or less stalled out to our northeast over the Hudson Bay area. The result is a northwesterly flow aloft over ND, which will bring periodic precipitation chances beginning this Friday, July 7. On Friday, a cold front is expected to move across ND and northern MN. The timing of the frontal passage is critical, but it looks like the cold front will initiate storms beginning in the afternoon hours east of the Missouri River as the front interacts with warm, moderately moist air that’s had ample time to heat up during the day. There will be some wind shear aloft, and these factors combine to give us a marginal risk for severe thunderstorms across eastern ND and northern MN, with 1-inch hail and 60 MPH winds being the main threats. Saturday looks wonderful, and Sunday brings a chance of thunderstorms in the afternoon. Slight rain chances return Tuesday night into Wednesday. Temperatures look to be seasonable, with daytime highs in the upper 70s to low 80s. Potential total rainfall through Thursday, July 13, is depicted in Figure 12. The 6 to 10 day forecast calls for slightly below normal temperatures and slightly above normal precipitation (Figures 13 and 14).

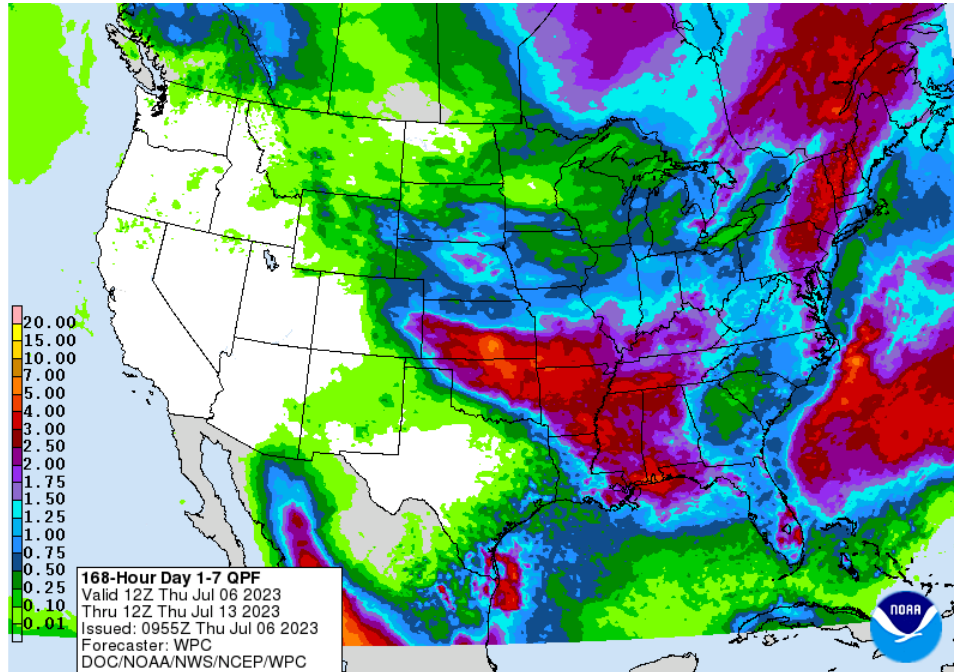


Figure 12. Precipitation forecast for the continental United States from 7:00 a.m. July 8 through 7:00 a.m. July 13.

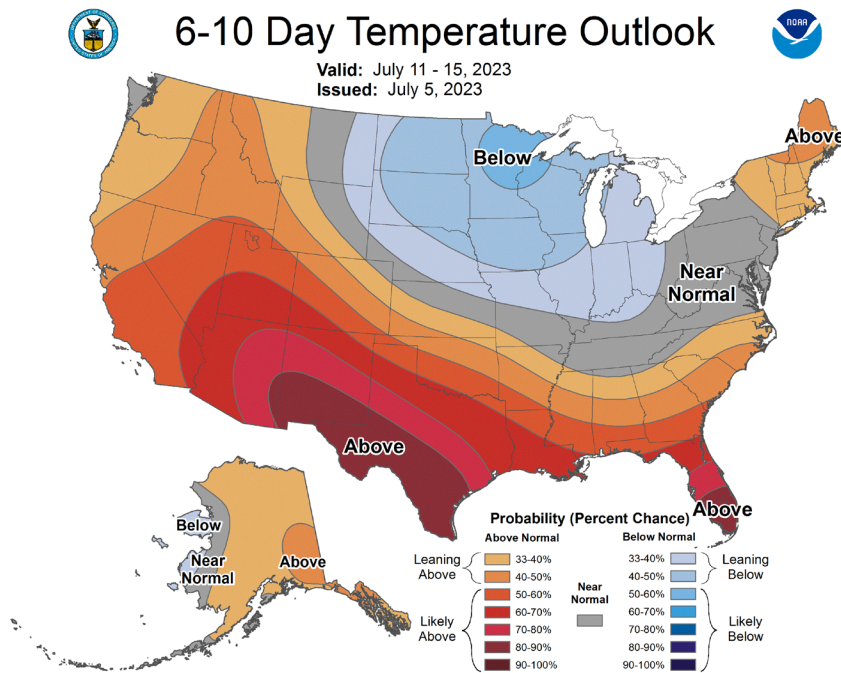


Figure 13. Temperature outlook for July 11 through July 15 for the continental United States and Alaska.

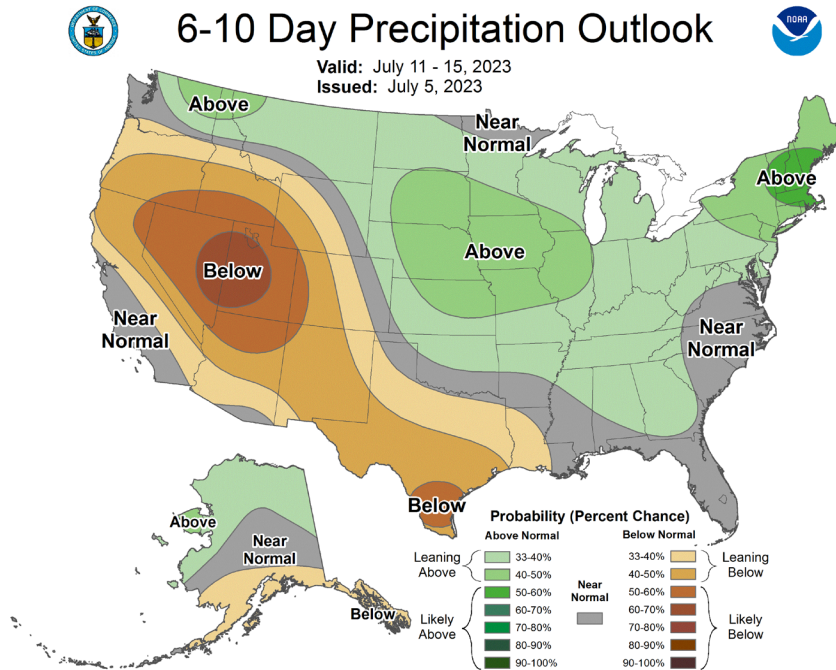


Figure 14. Precipitation outlook for July 11 through July 15 for the continental United States and Alaska.

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This publication is supported in part by the National Institute of Food and Agriculture, Crop Protection and Pest Management - Extension Implementation Program, award number 2021-70006-35330.