North Dakota State University
CROP & PEST REPORT
NDSU EXTENSION

No. 16 July 30, 2026

Inside this Issue...

2026 NDSU FIELD DAYS

The North Dakota State University Research Extension Centers' annual field days show N.D. Agricultural Experiment Station research in action. 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.

2026 Field Days Locations & Dates

Location	Date	Time
Nesson (WREC)	Aug. 5	9 a.m. - 1 p.m. CDT
Oakes (CREC)	Aug. 6	9 a.m. - 1 p.m. CDT

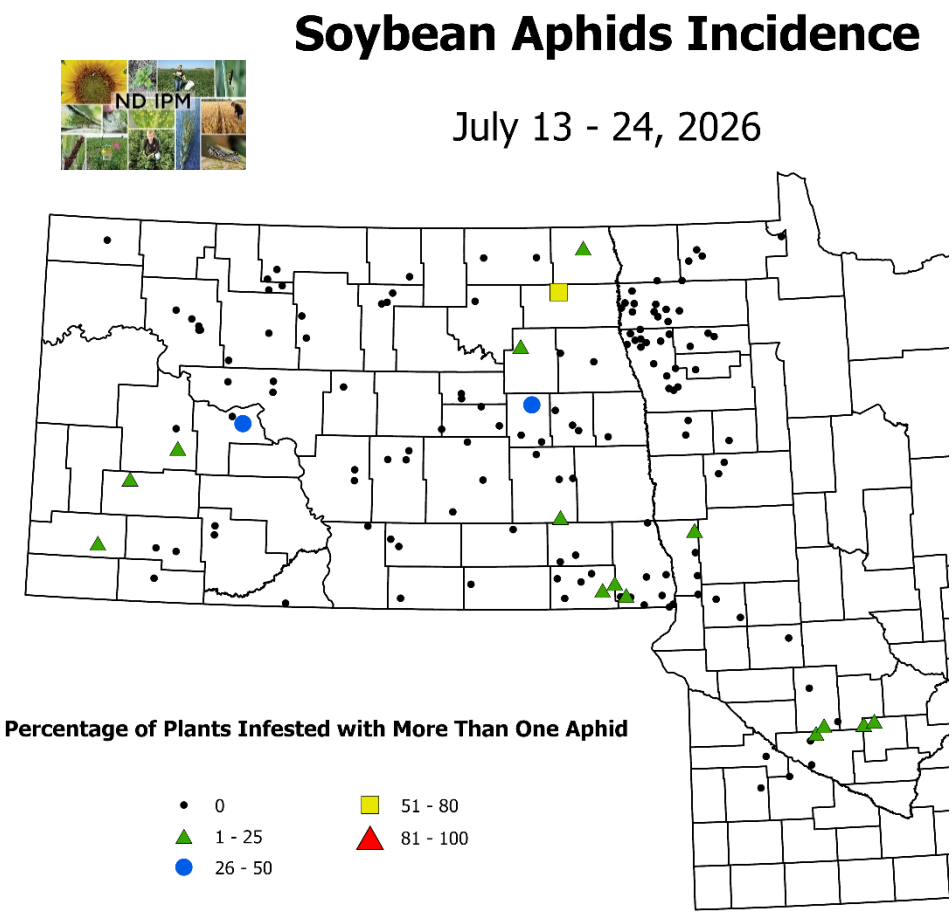
CREC Row Crop Tour Planned for August 20th.

The Carrington Research Extension Center's (CREC) annual Row Crop Tour will take place August 20, 2026 with registration starting after 8:15 AM. Speakers for the Row Crop Tour include Febina Mathew, Rex Sun, Juan Osrorno, Ana Carcedo, Andrew Friskop, Carrie Dottey, Michael Wunsh, Sam Markell, and Jeff Stachler. If farmers are having trouble with farm labor and want more flexibility, attend the afternoon program to see PTx'x OutRun autonomous tractor system. OutRun is a commercially available autonomy platform turning your existing tractor into a driverless machine. Tillage and autonomous grain cart operation will be demonstrated. A free lunch and snacks will be served thanks to the tour sponsors of North Dakota Soybean Council, ND Corn Utilization Council, Northarvest Bean Growers Association, National Sunflower Association, and PTx. CCA CEU credits will be available.

entomology

SOYBEAN APHID UPDATE

Soybean aphids increased slightly in North Dakota and west central Minnesota. About 20% of the fields scouted were positive for soybean aphids, with a range of 5 to 80% incidence and an average of only 1-25 soybean aphids per plant.



We are well below the economic threshold for soybean aphids. The economic threshold is an average of 250 aphids per plant, and when populations are actively increasing in 80% of the field.

Avoid unnecessary insecticide sprays, as they may trigger secondary pest outbreaks, such as spider mites (see spider mite article). Hot weather continues to slow down soybean aphid reproduction. Continue scouting until R6.

WATCH FOR SPIDER MITES

Hot, dry weather conditions favor spider mite outbreaks, and August is typically when we start to see movements into soybean, corn, dry bean, alfalfa, and other field crops. A wheat field in Griggs County near Cooperstown was reported by Jeff Stachler (CREC) to have a severe spider mite infestation on field edges.

Adult spider mites are tiny (less than 0.2 inch) and greenish white to orange red, with two dorsal spots and four pairs of legs. Nymphs are smaller than adults and have three to four pairs of legs. Magnification is often necessary to see mites.

Mites overwinter as eggs on vegetation like alfalfa. The life cycle of spider mites can be completed in only five to 14 days, with the fastest development rates occurring above 91 F.

Each female lives for 30 days and produces about 300 eggs during her lifetime. In hot, dry weather, natural fungal diseases of mites are slowed, and populations can increase from a few individuals to millions within a few generations. Mites thrive on nutrient-rich, drought-stressed plants.

Leaf injury symptoms appear first as stippling, then progress to yellowing, browning or bronzing as feeding injury increases and eventually to leaf drop in beans. Feeding injury causes water loss from the plant and reduces photosynthetic ability. In severe cases, premature leaf senescence, pod shattering and even plant death can occur.

Two-spotted spider mites on corn (P. Beauzay, NDSU Ext. Entomology)

When **scouting** for spider mites, look first on the underside of leaves and lower foliage at field edges for tiny mites and fine spiderlike webbing. A quick sampling procedure to determine whether mites are present is to hold a piece of white paper below leaves, then tap them to dislodge the mites. The mites appear as tiny dust specks; however, they will move slowly after being knocked off the leaf. Dislodged predatory mites will move faster than the two-spotted spider mite.

Watch the YouTube videos on spider mite scouting in soybean and corn:

Soybean – spider mite scouting

Corn – spider mite scouting

Another sampling measure involves pulling up plants and examining the underside of the leaves from the bottom of the plants upward. When spider mites need to move due to diminishing food supply, they climb to the top of plants and are dispersed by the wind through “ballooning,” so they can spread quickly within a field or to adjacent fields.

Infestations are typically first noted near field edges and fields near alfalfa (a preferred host). Insecticide products labeled for mite control often do not provide adequate control, and the mite population may rebound quickly to pretreatment levels or higher.

Sample plants at least 100 feet into the field. Walk in a "U" pattern and sample two plants per location at 20 different locations. Deciding whether to treat is difficult. Use the following general **action thresholds** in the table below.

Crop	Action Threshold	Susceptible crop stages
Soybean	Lower-leaf yellowing; stippling, webbing and mites are common in the lower to middle canopy.	Beginning pod (R3) through beginning seed (R5)
Dry edible beans	Lower ¼ to ⅓ of the canopy has mite damage symptoms and/or mites present.	Beginning pod (R3) through beginning seed (R5)
Field corn	Lower ¼ to ⅓ of the canopy has mite damage symptoms and/or mites present. Avoid letting mite damage reach the ear leaves .	Tasseling (VT) through the soft dough stage (R4)

Insecticides: Organophosphate insecticides (dimethoate, chlorpyrifos in soybean) are generally preferred over pyrethroid insecticides for spider mite control. **Pyrethroids (Asana XL, Baythroid XL, Mustang Maxx, Warrior II) tend to flare (increase) mite populations seven to 10 days after application.** Reasons for an increase in mite populations include: disruption of the natural enemies that control spider mites (predatory mites, thrips); increased movement of mites out of fields and increased reproductive rates of female mites. The **only pyrethroid insecticide that will control spider mites is bifenthrin (Bifenture, Tundra, Brigade, other bifenthrin generics).** Other insecticides/miticides registered for use include Agri-Mek SC (abamectin) and Zeal SC (etoxazole, an acaricide that controls spider mites by inhibiting chitin synthesis, which stops immature mites from molting and kills eggs, larvae, and nymphs. Oberon 2SC (spiromesifen) and Cymyte II (propargite) are available only in corn. See the *North Dakota Field Crop Insect Management Guide E-1143* for more information on insecticides.

Early detection facilitates timely and effective rescue treatments. Current insecticides for soybean provide short-term protection, about seven days of residual activity for mites and do not kill mite eggs. **Fields will need to be continually re-monitored for resurgent populations. If multiple applications are needed for spider mite control, be sure to rotate to a different mode of action with each subsequent application to prevent resistance.**

The efficacy of an insecticide can be significantly improved with sufficient coverage (greater than 18 gallons per acre of water by ground and 3-5 gallons per acre by air) and high-pressure application to penetrate foliage. Insecticides labeled for mite control have preharvest intervals of 18 days (bifenthrin) to 28 days (abamectin). Check product labels for current preharvest intervals and other use restrictions and plan accordingly.

RED SUNFLOWER SEED WEEVIL SCOUTING

Sunflower growth stages ranged from R2 to early flowering this past week. IPM Scouts observed red sunflower seed weevils (RSSW) in sunflower fields in southwest North Dakota. Please send in your weevil scouting reports with counts per head and field location.

Continue scouting until the economic threshold is reached or plants reach 70% pollen shed (R5.7). After R5.7, plants are no longer at risk for egg laying or significant damage, and larvae are protected inside seeds from insecticides.

Optimum Treatment Timing: It's recommended to treat when 3 out of 10 plants are just starting to shed pollen in a field. This provides flexibility in the event of weather delays or scheduling issues with aerial applicators. Early sprays for high RSSW populations may require a second application.

Oilseed Sunflower: The threshold can be calculated using the following formula:

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

Red sunflower seed weevil (Brandi Herauf, former IPM Scout)

2026 RSSW Economic Threshold (average # weevils per head)

Oilseed sunflower at 28 cents per lb:
25,000 – 16,000 plants per acre

- $6 insecticide cost per acre + $12 aerial application costs – **>5-8 weevils per head**
- $8 insecticide cost per acre + $12 aerial application costs – **>6-9 weevils per head**

Confection sunflowers:

- **>1 weevil per head**

Table 1. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals $18.00 per acre ($6.00 for insecticide and $12 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
0.22	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
0.30	7.3	6.9	6.6	6.3	6.0	5.7	5.5	5.2	5.0	4.8
0.31	7.1	6.7	6.4	6.1	5.8	5.5	5.3	5.1	4.9	4.7
0.32	6.9	6.5	6.2	5.9	5.6	5.4	5.1	4.9	4.7	4.5

Table 2. Economic Threshold for Oilseed Sunflowers - Number of adult red sunflower seed weevil per head when the cost of control equals $20.00 per acre ($8.00 for insecticide and $12 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
0.22	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
0.30	8.2	7.7	7.3	7.0	6.6	6.3	6.1	5.8	5.6	5.4
0.31	7.9	7.5	7.1	6.7	6.4	6.1	5.9	5.6	5.4	5.2
0.32	7.7	7.3	6.9	6.5	6.2	6.0	5.7	5.5	5.2	5.0

Confection or Hulling Sunflower Market. Red sunflower seed weevil control in confection sunflower is based on the need to keep seed damage below 0.5% to meet industry standards. Treatment is recommended when **1 to 2 weevils are found per plant**. The banded moth, seed weevil and the Lygus bug have all impacted the quality of confection sunflowers. It is recommended at this time that sunflowers grown for these markets be treated a minimum of two times, once at early flowering and again 5 to 7 days later. With this type of program, a window of protection should be provided to minimize the impact of all three seed-damaging insect pests. Growers should plan treatment schedules early.

BANDED SUNFLOWER MOTH SCOUTING

The banded sunflower moth is easy to identify with its dark brown band crossing through the middle of the wing at rest, and it is about ¼ inch long. Sampling sites should be at least 75 to 100 feet from the field margins. In monitoring a field, use the X pattern, counting moths on 20 plants per sampling site to obtain the total number of moths per 100 plants. Sampling should be conducted in the late bud stage (R3), usually during mid-July to early August. If treatment is warranted, it should be applied at the R5.1 sunflower plant growth stage (when 10% of the head area has disk flowers in flower or that have completed flowering). Scout during the day (late morning to early afternoon). This is when the moths are quiet, resting on the upper or lower leaf surfaces of sunflower plants. When disturbed, they flutter from plant to plant.

When sampling for moths during the day, the decision to treat or not is based on comparing the mean number of adult moths in the field to the Economic Injury Level (EIL) for moths. The EIL is the number of moths per head that cause seed damage and equals the treatment cost (the break-even point). Use the following formula based on treatment costs, plant population and market price to determine the adult moth EIL for day sampling.

EIL for Adult Moth Sampling during the Day:

$$\text{EIL (moths per 100 plants)} = \left(\frac{\text{Treatment Cost (\$)} / \text{Market Price}}{\text{(Plant Population)}}\right) \times 582.9) - 0.7$$

The constants in the formula simplify the calculation and include the amount of loss attributable to each banded sunflower moth larva. The current EIL threshold is an average number of 1-2 moths per 100 plants using a market price of 28 cents per lb., depending on plant population and insecticide cost (insecticide + application). See Tables 1 and 2.

Chemical Control and Application Timing: Chemical treatment is directed at the larval stage of the banded sunflower moth, which is the actual damaging stage. Once the decision to treat has been made, it is critical to time the spray application correctly to achieve maximum control. The best sunflower plant stage to treat is R5.1, when pollen shed is just beginning. This is the time when most banded sunflower moth eggs have hatched, and larvae are present, but before the head has seeds forming. At this time, the larvae are beginning to feed on the disk flowers, are exposed on the head, and are susceptible to the insecticide treatment. On older plants where seeds have begun to mature, most larvae will be feeding within the seeds or under the protection of the florets and will be protected from the insecticide. By then, much of the feeding damage has already occurred. An application at an earlier growth stage may be warranted if monitoring reveals egg-laying activity earlier than normal.

Table 1. Economic Threshold for Oilseed Sunflowers - Number of adult banded sunflower moths per 100 plants when the cost of control equals $18.00 per acre.												
Market Price	Sunflower Plants per Acre (x 1,000)											
$ per lb	14	15	16	17	18	19	20	21	22	23	24	25
0.22	2.7	2.5	2.3	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
0.23	2.6	2.3	2.2	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
0.24	2.4	2.2	2.0	1.9	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0
0.25	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.1	1.0	1.0
0.26	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9
0.27	2.1	1.9	1.7	1.6	1.5	1.3	1.2	1.2	1.1	1.0	0.9	0.9
0.28	2.0	1.8	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8
0.29	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7
0.30	1.8	1.6	1.5	1.4	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.7
0.31	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.7
0.32	1.6	1.5	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6

Table 2. Economic Threshold for Oilseed Sunflowers - Number of adult banded sunflower moths per 100 plants when the cost of control equals $20 per acre.												
Market Price	Sunflower Plants per Acre (x 1,000)											
$ per lb	14	15	16	17	18	19	20	21	22	23	24	25
0.22	3.1	2.8	2.6	2.4	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4
0.23	2.9	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3
0.24	2.8	2.5	2.3	2.2	2.0	1.9	1.7	1.6	1.5	1.4	1.3	1.2
0.25	2.6	2.4	2.2	2.0	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.2
0.26	2.5	2.3	2.1	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.2	1.1
0.27	2.4	2.2	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0
0.28	2.3	2.1	1.9	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	1.0
0.29	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	1.0	0.9
0.30	2.1	1.9	1.7	1.6	1.5	1.3	1.2	1.2	1.1	1.0	0.9	0.9
0.31	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8
0.32	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.8

IPM INSECT TRAP REPORT

Here are some reports from last week's IPM insect trapping (July 20-24, 2026). More insect-trapping maps are now posted on the IPM Crop Survey map website.

Banded sunflower moth and eggs (NDSU Extension Entomology)

Sunflower crop stages ranged from R2 to R4 last week. **Banded sunflower moth** and **Arthur's sunflower moth** increased from last week's trap numbers. Banded sunflower moths were detected at all trap sites (7) last week, and weekly trap catches ranged from 51 to 229 moths per trap.

Sunflower moth (J. Knodel, NDSU)

Sunflower moths were detected at five of the seven trap sites, and weekly trap catches ranged from 1 to 5 moths per trap for July 20-24, 2026. **Pheromone trap thresholds are 4 moths per trap per day, or 28 per trap per week.**

Migrant sunflower moths are attracted to early-flowering sunflower fields. The threshold for **field scouting is 1 to 2 moths per 5 plants**.

European corn borers were detected at five of the nine trap sites in southeastern North Dakota, and weekly trap catches ranged from 1 to 15 moths per trap for July 20-24, 2026. The highest trap catch was in Cass County near Argusville. The crop stage was R1.

European Corn Borer Trapping - 2026

Field_ID	County	Town	Week 1 - June 29-July 3			Week 2 - July 6-10			Week 3 - July13-17			Week 4 - July 20-24			Cumulative Total	
			Z-race	E-race	Total	Z-race	E-race	Total	Z-race	E-race	Total	Z-race	E-race	Total	Z-race	E-race
Barnes 1	Barnes	Sibley	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnes 2	Barnes	Rogers	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cass 1	Cass	Argusville	0	0	0	0	0	0	1	0	1	15	0	15	16	0
Ransom 1	Ransom	Lisbon	0	0	0	0	0	0	4	0	4	0	0	0	4	0
Richland 1	Richland	Galchutt	1	1	2	2	0	2	16	3	19	7	0	7	26	4
Richland 2	Richland	Hankinson	0	0	0	3	0	3	2	0	2	3	0	3	8	0
Sargent 1	Sargent	Gwinner	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Sargent 2	Sargent	Rutland	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Steele 1	Steele	Finley	0	0	0	0	0	0	5	0	5	1	0	1	6	0
	6 counties	**Totals**	**1**	**1**	**2**	**5**	**0**	**5**	**28**	**3**	**31**	**27**	**0**	**27**	**61**	**4**
	trapped	**Race %**	**50.0**	**50.0**	**100.0**	**100.0**	**0.0**	**100.0**	**90.3**	**9.7**	**100.0**	**100.0**	**0.0**	**100.0**	**93.8**	**6.2**

Janet J. Knodel
Extension Entomologist

Patrick Beauzay
Research Specialist & IPM Coordinator

plant pathology

FEATURED MATCHUP: NDSU PLANT PATHOLOGISTS VS. BROWN STEM ROT OF SOYBEAN

Players to Watch:

- Brown Stem Rot (**Cadaphora gregata**)

Scouting Report:

- The pathogen, Cadophora gregata, causes brown stem rot of soybean after early infections in the vegetative stages
- Symptoms often become noticeable during reproductive growth stages, especially from R3 through R6
- The disease gets its name from the brown discoloration that develops inside the soybean stem on pith tissue
- Foliar symptoms may or may not occur, depending on the pathogen type, soybean variety, and environmental conditions

Figure 1. Brown stem rot causing browning in the pith tissue of the soybean stem.

Opponents Gameplan:

- The pathogen infects soybean roots and moves into the lower stem
- Once inside the plant, it colonizes lower stem tissue and causes browning of the pith tissue (very center portion of stem)
- Aboveground symptoms may include yellowing and browning between leaf veins while the veins remain green
- Splitting stems lengthwise is one of the best ways to scout for brown stem rot

Opponents Strengths:

- The pathogen can survive for multiple years in soybean residue
- Symptoms often do not appear until later in the season, after yield potential may already be affected
- Foliar symptoms are not always present
- Disease can be more severe in fields with short soybean rotations
- Cool and wet conditions can favor disease development

Opponents Weaknesses:

- Crop rotation to a non-host crop, such as corn or small grains
- Planting soybean varieties with resistance
- Managing soybean residue by tillage
- Reducing other plant stresses where possible, especially soybean cyst nematodes
- Scouting fields with a known history of brown stem rot
- Splitting stems to look for internal browning of pith tissue before assuming symptoms are caused by another disease

Trick Play to Watch:

Brown stem rot can look like sudden death syndrome because both diseases can cause interveinal yellowing and browning of soybean leaves. The key difference is inside the stem. With brown stem rot, the internal stem tissue is often brown, especially in the pith and vascular area. With sudden death syndrome, the pith usually remains white even though the vascular tissue near the roots may be discolored. When scouting, pull plants, split stems lengthwise, and compare both leaf symptoms and internal stem discoloration before making a diagnosis.

Figure 2. Development of foliar symptoms (interveinal chlorsis) due to brown stem rot of soybean.

Wade Webster
Extension Plant Pathology, Soybeans

Eric Branch
Extension Plant Pathology, Sugarbeets

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Extension Plant Pathology, Small Grains and Corn

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WHITE MOLD UPDATE ACROSS THE STATE

Soybean:

Due to high temperatures and low precipitation and humidity levels across almost the entire state, white mold risk in soybean remains low. With these conditions, if any late soybeans are still flowering, fungicide applications are not recommended. As we are also towards the end of July, and the end of soybean flowering, this will be the last week of the soybean white mold risk maps for the 2026 season. However, if you are still interested in these maps, please continue to monitor the maps here. These maps will be left on the website for a few more weeks, and then they will be taken down for the season so unnecessary applications are not made. It is important to remember that white mold control will not occur with fungicide applications made after the disease is visible.

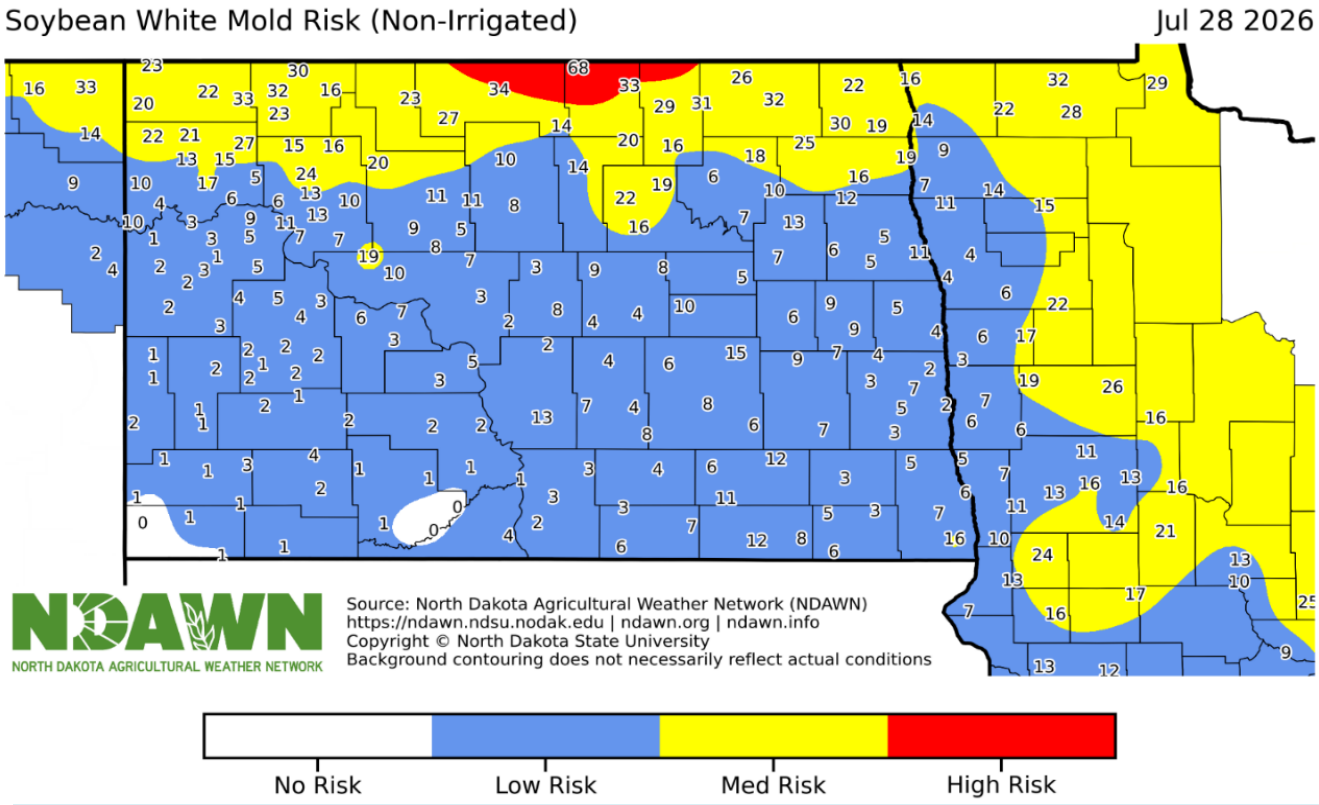

Figure 1. Soybean white mold risk maps as of July 28th, 2026.

Canola:

Similar to soybean, high temperatures and limited moisture have reduced (or moderated) the risk across much of the state. Some localized areas that have received additional rainfall remain in elevated risk. However, the vast majority of the crop has advanced past the timing a fungicide application can be made for maximum efficacy (early bloom).

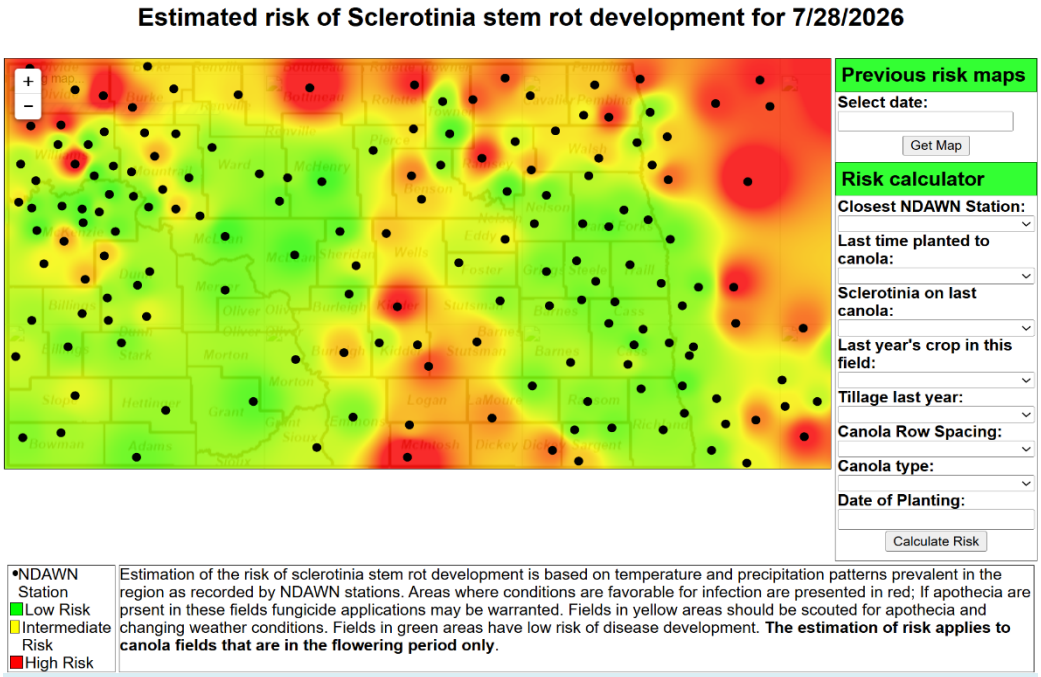

Figure 2. Sclerotinia stem rot risk in canola as of July 28th, 2026.

Dry Bean:

High temperatures and limited moisture have continued to lower the risk of white mold; both the soybean and canola risk maps reflect this. Risk would likely be higher in irrigated beans, but high temperatures will continue to moderate risk.

Sunflower:

About one third of the sunflowers in the region are now blooming (according to the National Sunflower Association 'Sunflower Highlights' e-newsletter on July 27), and the rest will bloom soon. Like other crops, sunflowers are susceptible to infection when blooming. However, results from over a decade of research conducted by NDSU showed that fungicide applications did not provide meaningful or consistent efficacy against the disease. Fortunately, the risk of infection is low in most of the region, as the persistent high temperatures and low moisture negatively impact the pathogen and its ability to cause infection.

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Extension Plant Pathology, Broadleaf Crops

WHEAT AND BARLEY DISEASE REPORT

The heat over the last three weeks has drastically reduced disease development in small grains for most of the state. Over the last two weeks the IPM scouts have reported Fusarium head blight (FHB; Figure 1) in 17% of the barley fields and 29% of the wheat fields. However, FHB severity and incidence within a field have been low. The areas of the state with more frequent reports of FHB have been northeast and northcentral to northwest ND (Figure 2). For the leaf disease bacterial leaf streak (BLS), the scouts found BLS in 13% of the barley fields and 17% of the wheat fields. Other wheat and barley diseases that have been reported at low incidence levels include loose smut, net blotch, tan spot, and ergot.

Figure 1. Fusarium head blight in durum, two-row barley and hard red spring wheat.

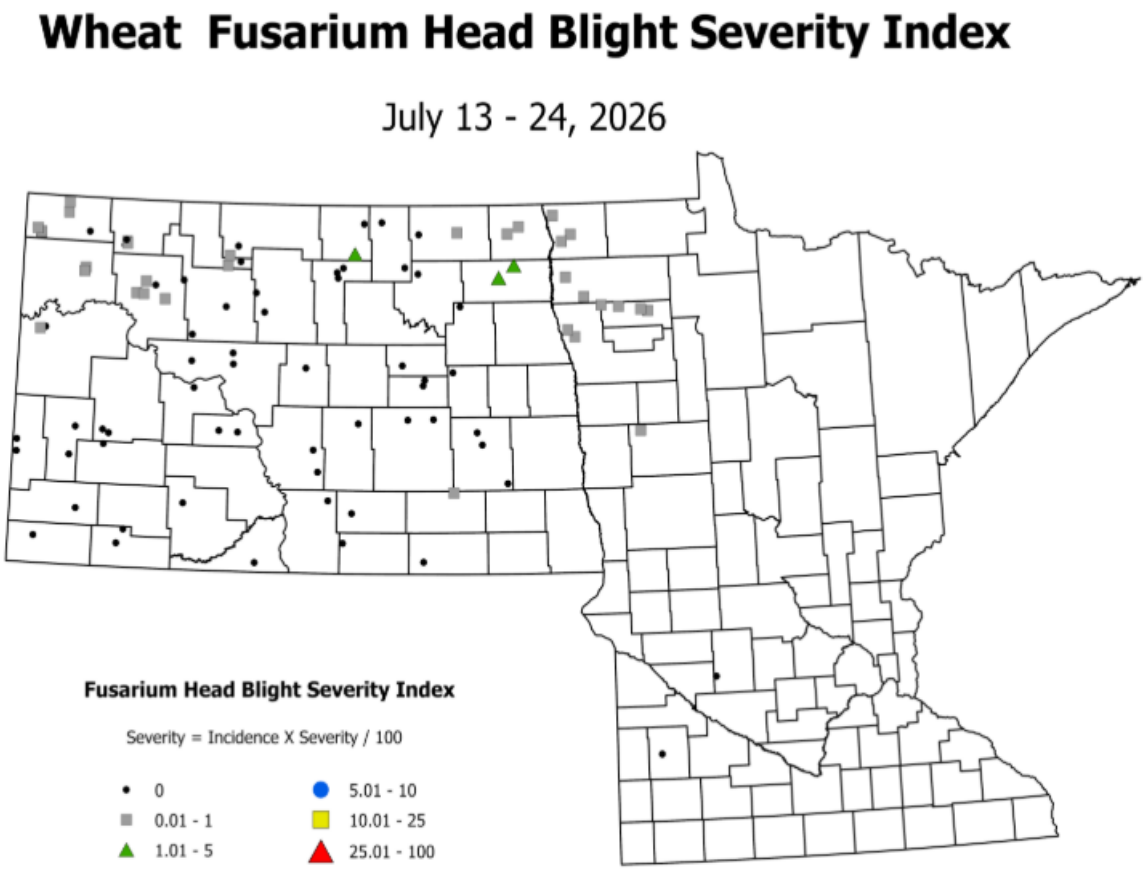

Figure 2. Fusarium head severity index for fields scouted between July 13-24.

Andrew Friskop
Extension Plant Pathology, Cereal Crops

plant science

HEAT STRESS DURING REPRODUCTIVE STAGES: WHY THIS WEEK'S WEATHER MATTERS

Most crops across North Dakota have reached reproductive development, making them considerably more sensitive to high temperatures than they were earlier in the season. While daytime temperatures near 90°F are not uncommon during late July, their effect depends largely on the crop growth stage and the availability of soil moisture, which is abnormally dry in great part of the state (Figure 1). High temperatures accelerate crop development and increase atmospheric demand for water, but when they coincide with drought, plants close their stomata to conserve water, reducing photosynthesis and limiting the carbohydrates available for seed

development. At the same time, warm temperatures increase respiration, further reducing the energy available for grain or seed fill. Together, heat and drought often cause much larger yield losses than either stress alone.

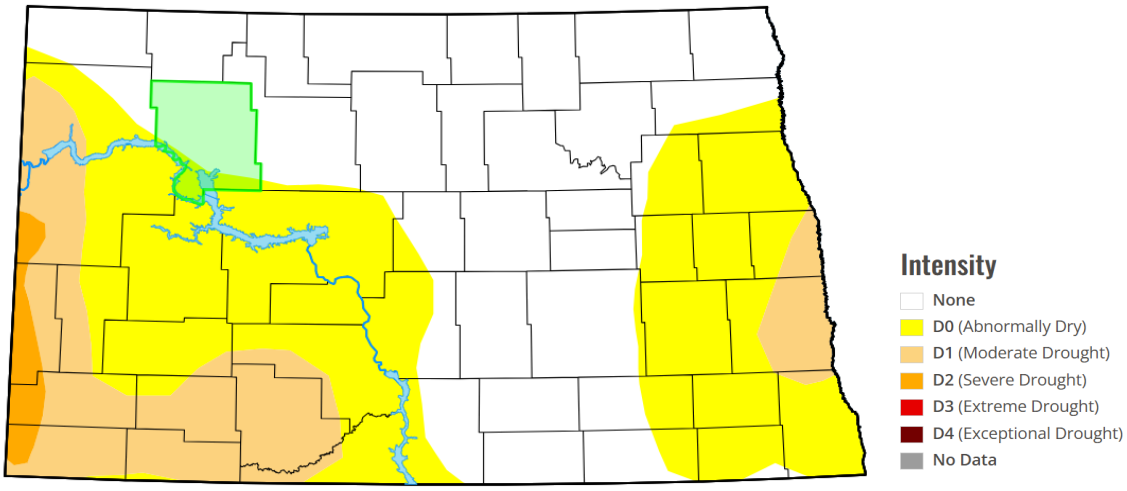

Figure 1. Drought monitor map. Map released: Thurs. July 23, 2026. Source: droughtmonitor.unl.edu

Soybean (R3 – Beginning Pod)

Soybean enters one of its most critical yield-determining periods at **R3 (beginning pod)**. During this stage, temperatures above the optimum range (77–86°F) increase flower and young pod abortion while shortening the seed-filling period. Under adequate soil moisture, soybean plants can often tolerate several days of temperatures around 90°F with only modest yield impacts. However, when heat is accompanied by drought, stomatal closure reduces photosynthesis precisely when the crop has its greatest demand for assimilates, resulting in fewer pods, fewer seeds per pod, and reduced seed size. High nighttime temperatures further increase respiration, decreasing the amount of carbohydrates available for reproductive growth and reducing final yield. Soybeans at reproductive stages are substantially more sensitive to heat than at vegetative stages, particularly when water is limiting.

Canola (Pod Filling)

Canola is among the most heat-sensitive broadleaf crops grown in North Dakota. During **pod filling**, optimum temperatures are approximately **60–75°F**, and temperatures above **82–86°F** accelerate seed development, shortening the seed-filling period and reducing oil accumulation. Heat stress during this stage often results in smaller seeds and lower oil content. When drought occurs simultaneously, reduced water availability limits photosynthesis and accelerates leaf senescence, further decreasing the supply of carbohydrates to developing seeds. This combination commonly results in lower seed weight, reduced yield, and diminished seed quality.

Sunflower (R1–R5)

From **R1 (bud formation) through R5 (flowering)**, sunflower transitions from vegetative growth into pollination and the beginning of seed set. Although sunflower is generally more heat tolerant

than soybean or canola, temperatures above **95°F** during flowering can reduce pollen viability, decrease seed set, and ultimately reduce yield. Heat stress also increases plant water use, making adequate soil moisture essential during this period. Under drought conditions, reduced leaf expansion, stomatal closure, and lower photosynthetic rates limit the carbohydrates available for developing seeds. Severe heat combined with drought can reduce seed number, lower kernel weight, and decrease oil concentration. Flowering and early seed development are the stages when sunflower is most susceptible to environmental stress.

Take-Home Message

Heat alone does not necessarily translate into yield loss. Many crops can withstand several days of temperatures near **90°F**, particularly when soil moisture is adequate and nighttime temperatures remain relatively cool. However, reproductive stages (including **soybean at R3, canola during pod filling, and sunflower from bud formation through flowering**) are far more vulnerable than vegetative stages. When high temperatures coincide with drought, the combined effects of reduced photosynthesis, increased respiration, and accelerated crop development substantially increase the risk of yield loss.

Ana Carcedo
Broadleaf Crop Agronomist

WHEAT IS READY & CORN IS STRUGGLING

Extremely high temperatures of the last two weeks have dramatically sped up crop maturity farmers in SW ND began harvesting small grain last week. Farmers in SE ND are starting spring wheat harvest this week.

Farmers NE ND may start spring wheat harvest this or next week. For many producers this will be the earliest spring wheat harvest in eastern ND since the droughts of the 1980's. Wheat and durum fields in Western & central ND that were planted late & got good rain fall in June are still green and are maturing at a more typical pace.

The ND 2026 corn crop has already lost top yield potential due to the extended, very high, temperatures. Corn that has been tasseling & silking over the past two weeks has likely lost top yield due to reduced pollen & silk viability. The only redeeming factor of the high temp & high humidity days is that high humidity can prolong silk viability. For corn grain to achieve average yields most fields are in desperate need of rain and will need it in the next 5-10 days.

As you start harvest please stay safe. Take breaks, drink water, and have a water truck ready.

Clair Keene
Extension Agronomist Small Grains and Corn

weeds

KEY TO IMPROVED WEED MANAGEMENT: MANAGE FIELD PERIMETERS AND INSIDE FIELD WEED PATCHES NOW.

One important reason for reduced weed control in crop fields is due to the lack of field perimeter and inside field weed patches weed management. In 2021 in Griggs County, only 4 percent of hard red spring wheat fields had Canada thistle present within the field at harvest time. In 2025 a whopping 25 percent of hard red spring wheat fields in Griggs County, had Canada thistle present within the field at harvest time.

Figure 1: Extensive patch of Canada thistle and Perennial sowthistle currently along the outside field perimeter with seeds ready to blow into the field creating future weed management issues. Mowing these plants will reduce spread of weed seeds.

Allowing weeds such as the Canada thistle and perennial sowthistle along the field perimeter (Figure 1) allows weed seeds of these species to blow inside the field creating future management problems. Absinth wormwood is another wind-dispersed perennial weed species creating challenges in hard red spring wheat is. In 2025 in Eddy County, 33 percent of hard red spring wheat fields had absinth wormwood within the field at harvest time. Leaving wind-dispersed weed species such as Canada thistle, perennial sowthistle, absinth wormwood, horseweed (marestail), other sowthistle species, and prickly lettuce along the field perimeter allows these weed seeds to blow inside the crop field, making it more difficult to manage these species in the field.

Figure 2: Dense kochia along the outside and inside perimeter of a sunflower field. Mowing all kochia plants including the compromised sunflower plants will help reduce kochia from moving farther into the field.

Annual grass and broadleaf herbicide-resistant weeds including kochia (Figure 2), waterhemp, wild oat, green foxtail, horseweed, and common ragweed along the outside field perimeter or near the outside edge of fields creates weed management challenges (Figure 2). At harvest, the combine platform header cuts- off these plants and scatters debris including seed farther into the field. Mow the crop along with the weeds in the outside crop rows especially if crop yield has been reduced by weed pressure.

Neglecting foxtail barley (Figure 3) or kochia (Figure 4) weed patches within a field, especially where there is no or very little crop causes weed seeds to be spread farther within and among crop fields making future weed control more difficult. Mow weed patches when they begin to flower. (Figure 5)

Figure 3. Dense foxtail barley patch within a hard red spring wheat field. The reduced hard red spring wheat and foxtail barley patch needs mowed immediately to reduce seeds from spreading farther into the field and into other fields.

Figure 4. Dense kochia patches in this hard red spring wheat field needs mowed as soon as the first plants begin flowering. All wheat plants next to kochia plants needs mowed as well.

Figure 5. A properly mowed and maintained outside field perimeter reducing weed seed production and movement of weed seed further into the field.

The best way to manage outside field perimeters is to mow to a height of 12 inches when the most problematic weed species, including Canada thistle, perennial sowthistle, absinth wormwood, or herbicide-resistant annual weeds begin to flower. Drive slowly when mowing to evenly cut the weeds. Mowing at this 12-inch height will encourage highly branching weed specie such as kochia and waterhemp to create stronger branches at the base and branches higher up in the plant canopy. Mow the as close to the soil as possible and in the opposite direction of the initial mowing operation to lift plants knocked down by tractor and mower tires from the first mowing (Figure 6). Scout the field margins to determine if weeds begin to regrow a second time and mow as often as needed to reduce the most weed seed production. Mow 5 to 15 feet outside the field perimeter so as to not destroy all animal habitat. For wind-dispersed weeds, mow the full 15 feet away from the field perimeter.

There are large patches of foxtail barley in saline areas of fields where seeds have started to blow great distances into the field and/or into neighboring fields. Mow these areas as close to soil as possible and as soon as possible to force the seeds to stay in place and not blow to other cropland. Scout mowed foxtail barley areas and mow every time there are new seedheads through the month of August. Do not mow these areas after the end of August to allow weeds to regrow and apply glyphosate at 1.5 pounds acid equivalent per acre after a freeze. If soil salinity levels are so high that no crop will grow, leave the foxtail barley as a ground cover and mow as often as necessary to stop seed production or plant the area to salt tolerant plant species for grazing or haying to reduce soil salinity.

Mow all field perimeters and dense weed patches within a field at your earliest convenience to improve future weed management within a crop field. The author thanks Dr. Tom Peters for reviewing this article.

Jeff Stachler
NDSU Extension Cropping Systems Specialist at
Carrington Research Extension Center

Figure 6. A properly mowed and maintained outside field perimeter reducing weed seed production and movement of weed seed further into the field.

farm health and wellness

TIPS FOR WORKING TOGETHER IN FARMING ACROSS GENERATIONS

Sharing decisions, asking for what you want, listening well and resolving conflicts quickly can help eliminate stress among generations farming or ranching together. Although there are potential stress issues when generations farm or ranch together, here are some practical strategies for reducing stress and solving concerns.

Six Tips for Working Together
Here are six tips for working together in farming or ranching efforts.

- **Avoid blame, wishful thinking or regrets.** Think about what's happening now and focus on solutions.

- **Ask for what you want directly.** "What I'd like from you is . . ." Remember, the other person is free to say yes or no. Seek to foster respect and consideration for each other.

- **Recognize and appreciate individuals for their contributions.** If you feel a need for support, ask for it and explain what you need.

- **Check what another person really wants from you.** This is a good way to get expectations out in the open.

- **Check whether the other person heard you accurately.** "Would you please tell me what you heard me say?"

- **Make your own traditions.** Schedule an annual family get-together at a nearby lake or other activity. Get everyone involved. Organize an activity that all can enjoy so that in the end, everybody feels good.

Access Helpful Resources
Life as a family in farming or ranching will never be totally free from stress. But through understanding how to better work together across generations, families can resolve problems, work to ease pressures and stay connected.

To learn more specifically about tips and tools in managing stress across generations on the farm, read the NDSU Extension publication FS286, "When Generations Farm/Ranch Together" – link: When Generations Farm/Ranch Together | NDSU Agriculture

If you or someone you know is in need of mental health or substance abuse resources, call or text the **9-8-8 Suicide and Crisis Lifeline**, or chat at https://988lifeline.org.

Contact your NDSU Extension county office or search the Web for *NDSU Extension farm stress* for more resources on wellness in agriculture.

Working together on the farm includes reducing your stress and taking care of your family relationships.

Sean Brotherson
Extension Family Science Specialist

Adriana Drusini (adriana.drusini@ndsu.edu)
Extension Farm and Ranch Stress Program Coordinator

around the state

AROUND THE STATE

NORTHEAST ND

Crop conditions and soil moisture vary considerably across the region. Small grains are mostly heading and beginning to turn color, while soybeans range from flowering (R1) to pod development (R3). Most corn is at or approaching the tasseling stage. Field peas are turning color, sunflowers are in the bud to bloom stages, and canola ranges from flowering to pod development.

Corn drying near Inkster
Photo: Venkat Chapara, Plant Pathologist, LREC

Soil moisture conditions remain highly variable, with significant differences occurring even within individual counties. Some areas are experiencing dry conditions and crop moisture stress, while others have adequate moisture but would benefit from additional rainfall. Recent hot temperatures have accelerated development of corn, sunflowers, and soybeans, allowing these crops to catch up after earlier delays.

Wheat field infested with perennial sow thistle in Pembina County
Photo: Anitha Chirumamilla, LREC

Towner County has reported a suspected Palmer amaranth infestation, which is currently being confirmed through tissue analysis at the Genotyping Center in Fargo. Weed control issues are becoming more apparent across the region, including perennial sow thistle infestations in wheat fields in Pembina County and wild oat infestations in wheat fields in Cavalier County.

Soybean aphids are beginning to appear throughout the region. In most areas, populations remain low, but in some fields, they are approaching the economic threshold. The forecasted hot and dry conditions may slow population growth and provide an opportunity for natural enemies to suppress aphid numbers.

Diamondback moth trap counts continue to increase across the region. Growers should scout canola fields for larval activity and base insecticide applications on field scouting and established economic thresholds rather than trap counts alone.

Wild oats in a wheat field in Cavalier County
Photo: Anitha Chirumamilla, LREC

Corn in Pierce County
Photo: Natalie Wibe, ANR Extension Agent, Pierce County

Soybeans at flowering in Pierce County
Photo: Natalie Wibe, ANR Extension Agent, Pierce County

Anitha Chirumamilla
Extension Cropping Systems Specialist
Langdon Research Extension Center

NORTHWEST AND SOUTHWEST ND

Adams and Bowman County agents reported about 50% of small grain crops have been baled for forage rather than harvesting grain due to the severe drought and high temperatures. Crop condition in this area is very poor with small grain and pea harvest beginning.

The farther north you go the better the crops look, however crop condition continues to decline in much of the west. Crop condition closer to the Canada border looks better depending upon rainfall.

Peas are being desiccated in much of the southwest part of the state and small grain harvest just beginning.

Canola looks pretty good once you get out of the very southwest part of the state, however, later planted canola is not looking good in most of the west due to heat and flowering stopping early and pod abortion.

Most corn is in the R1 stage in the southern 2/3 of the west. Sunflowers look good vegetatively in most of the west, however sunflower head diameter appears to be smaller than normal.

Jeff Stachler
NDSU Extension Cropping Systems Specialist at Carrington Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

The biggest story across most of the region is the continued strengthening of the drought and high temperatures continuing to push along crop maturity. Some insects are getting started in the region now, such as soybean aphid and grasshoppers, spider mites in the drought areas of the region, and red seed sunflower weevil in the southwest part of the region. Hail damage occurred in some areas of the region last week, especially in Logan and LaMoure Counties as shown in Figure 1.

Figure 1. Hail damage in eastern Logan County last Friday. Photo from NDSU Extension Logan County ANR Agent Josh Becker

Rainfall for the week was below 0.06 inch for much of the region, while Jud received 0.96 inch. Water deficits continue to run high across most of the region and soil moisture continues to decline as shown by the soil crack (Figure 2) in a Burleigh County durum field last Friday. Figure 3 shows the extreme drought stress on corn in large areas of a field in southeast Emmons County.

Figure 2. Wide soil crack in a Burleigh County durum field last Friday.

Figure 3. Severe drought-stressed corn in Southeast Emmons County on July 27th. Photo from NDSU Extension Emmons County ANR Agent – Nancy Deis.

Figure 4. Severe spider mite infestation in a Griggs County soybean field July 28th.

Figure 4 shows severe spider mite infestation in a Griggs County soybean field. Figure 5 shows the beginning of soybean aphids in Burleigh County. Beneficial insect populations are building across the region, particularly in response to soybean aphids. Figure 6 shows many lacewing eggs hanging on a sunflower plant in Burleigh County last Friday.

Corn growing degree days (GDD's) increased substantially again over the past week as shown in Table 1. The McHenry NDAWN area saw the greatest GDD increase from last week of the 7 NDAWN Stations. Denhoff continues to be behind the normal GDD's for this time of year while all other locations were at least 48 GDD above the normal. Based upon the accumulated GDD's at Denhoff since May 13th, an 80-day corn hybrid should reach black layer by September 4th, 2 days later than last week. Based upon the accumulated GDD's at Mooreton since May 13th, a 95-day corn hybrid should reach black layer by September 17th, 2 days earlier than last week.

Figure 5. A few soybean aphids on a soybean leaf in Burleigh County last Friday.

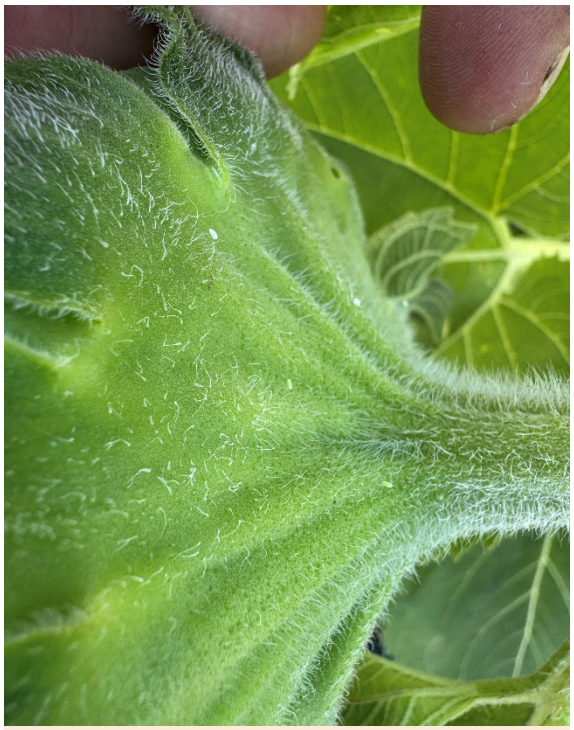

Figure 6. Many lacewing eggs on a sunflower plant in Burleigh County last Friday.

Table 1. Accumulated and departure from normal GDD's for seven NDAWN stations across the region.

	Denhoff	Linton	McHenry	Jamestown	Edgeley	Mayville	Mooreton
Accumulation from 5-13 to 7-27, 2026	1172	1268	1256	1239	1311	1365	1413
Departure from last newsletter	+ 146	+ 146	+ 152	+ 146	+ 147	+ 149	+ 143
Departure from normal	- 25	+ 48	+ 133	+ 84	+ 129	+ 210	+ 146
Departure from 2025	+ 184	+ 138	+ 191	+ 153	+ 181	+ 248	+ 241
Departure from the 5-year average	+ 33	+ 26	+ 78	+ 40	+ 40	+ 105	+ 85
Departure between last newsletter and July 21st for the 5-year average	- 3	- 11	+ 2	- 5	- 10	- 2	- 15

Hard red spring wheat (HRSW) and barley harvest has begun in the southeast and southern parts of this region. HRSW stage in the region ranges from flowered to harvested with most at late soft-dough stage. Barley, Durum, and HRSW crops declined in quality again this past week. I have not heard any yield information as of yet.

Corn condition declined this past week in most of the region and drastically in some areas. Corn growth stage in the region ranges from about V16 (16 collars) to late R2 (silking with some brown silks showing) with most corn at R1 (beginning to silk).

Soybean crop declined in condition this past week in most of the region due to the drought and heat. Soybean growth ranges from R2 (full flower) to R4 (at least one 1-inch pod within one of the top four nodes having fully expanded leaflets) with most at the R3 (3/16-inch pod) stage.

Most canola has completed flowering in the region with canola in the southern part of the region starting to turn yellow.

Dry bean condition declined in most of the region this past week. Dry bean growth stage ranges from R1 (flowering) to the R4 (pods 3 inches long) with most at the R3 (1 inch pods).

Sunflowers look really good vegetatively across the region, however as plants being flowering, sunflower head diameter is less than the last two years. Sunflower growth stage ranges from R1 (flower bud visible) to early R5.5 (50% of head flowered) with most at the R4 (petals visible) stage.

Dry pea condition declined but due diseases and heat. Most peas have completed flowering and podding and some are being desiccated for harvesting.

Continue to stay cool and hope for rain on Thursday!

Jeff Stachler
Extension Cropping Systems Specialist

weather

WEATHER FORECAST

The July 30 to August 5, 2026 Weather Summary and Outlook

Very little rain fell during the past 7 days (Figure 1). In fact, many of the stations that recorded just a few hundredths of an inch last week, that moisture came from dew, not rain. What little rain did fall was associated with severe weather on Friday evening, July 24. There will be some chances of rain this forecast period, including today, but odds favor most locations recording only light amounts.

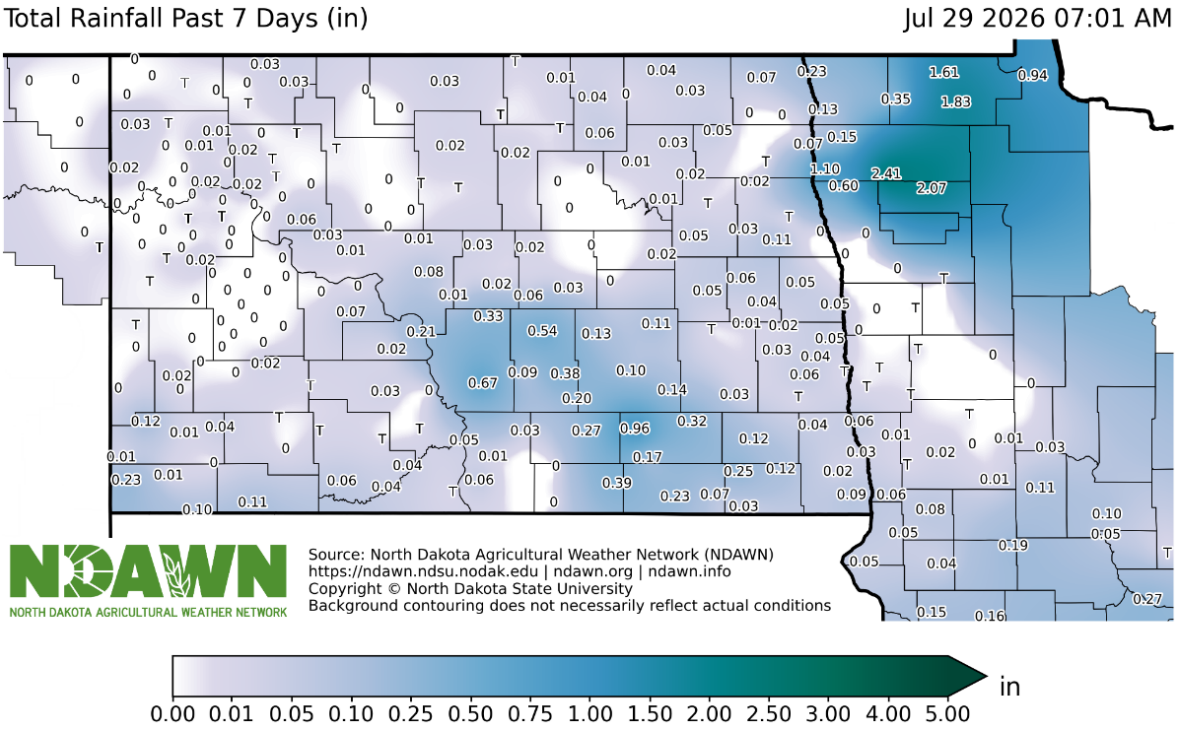

Figure 1. Total Rain at NDAWN stations from July 23 through 7:00 AM on July 29, 2026

The lack of rain has this month has been severe. There are a few stations in eastern North Dakota into bordering areas in Minnesota that have recorded less than 10% of average rain this month. July 2026, depending on any potential rain today, may end up as one of the driest on record in some areas (Figure 2).

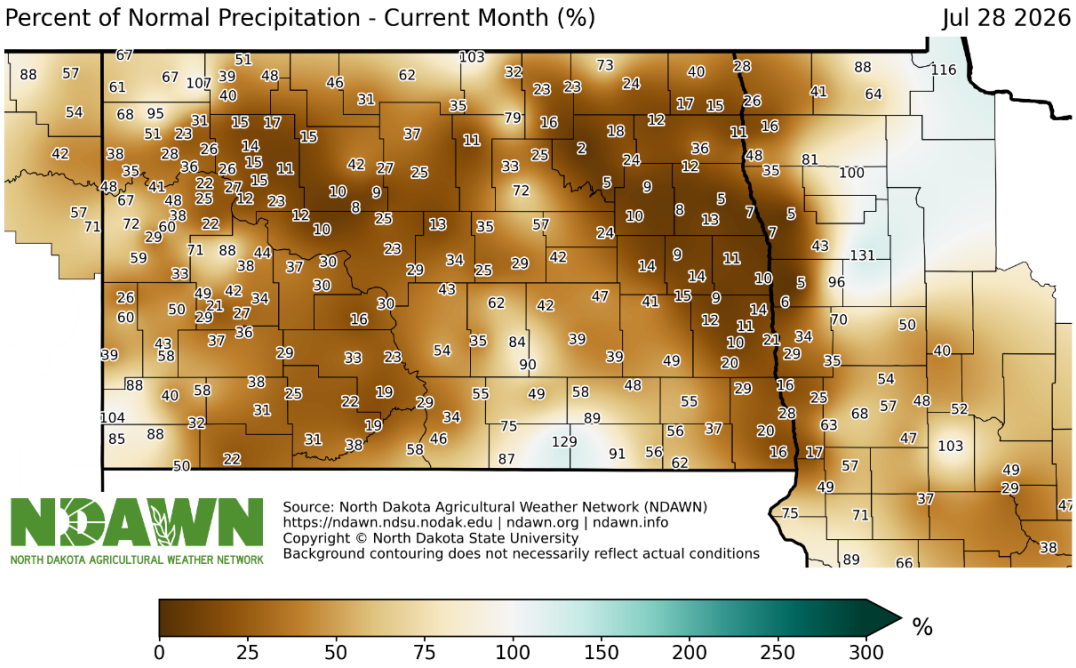

Figure 2. Departure from Average Rainfall from July 1 through July 28, 2026

If lack of rain this month wasn't severe enough, the heat this month greatly increased the evaporation potential. July 2026 was no where near as brutal as the famed heat wave of 1936, yet, this month will go down as one of the warmest on record for much of the state. Temperatures this month have been averaging 4 to 7 degrees above average in many parts of North Dakota (Figure 3).

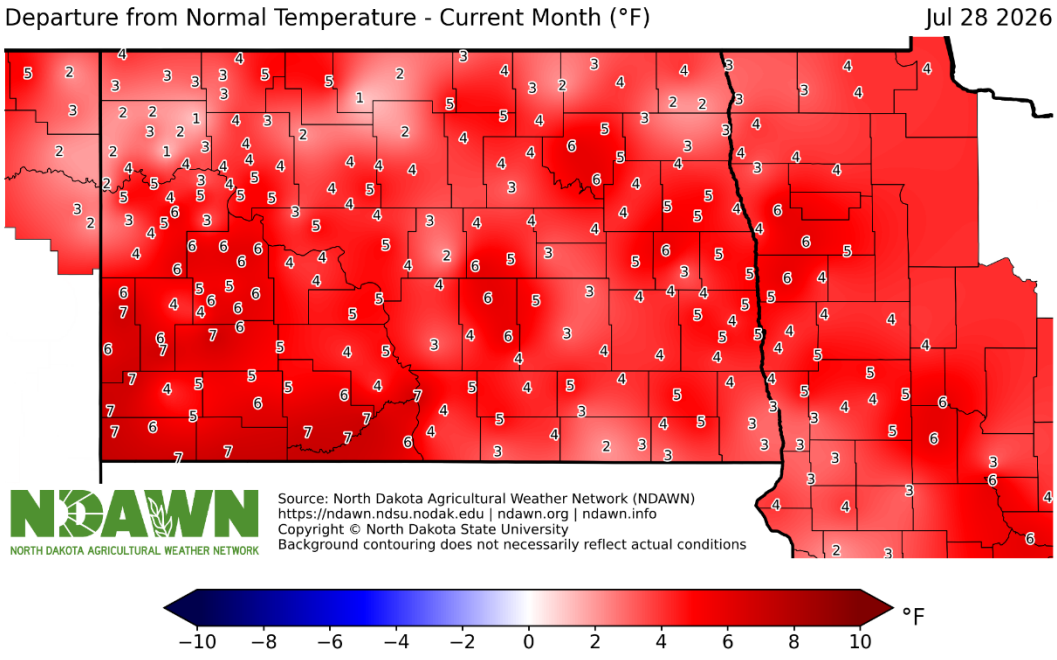

Figure 3. Departure from Average Temperatures for the period of July 1 through July 28, 2026

Figures 4 and 5 show the forecasted growing degree days (GDDs) for base 32° (wheat) and base 50°F (corn and soybeans) during this forecast period.

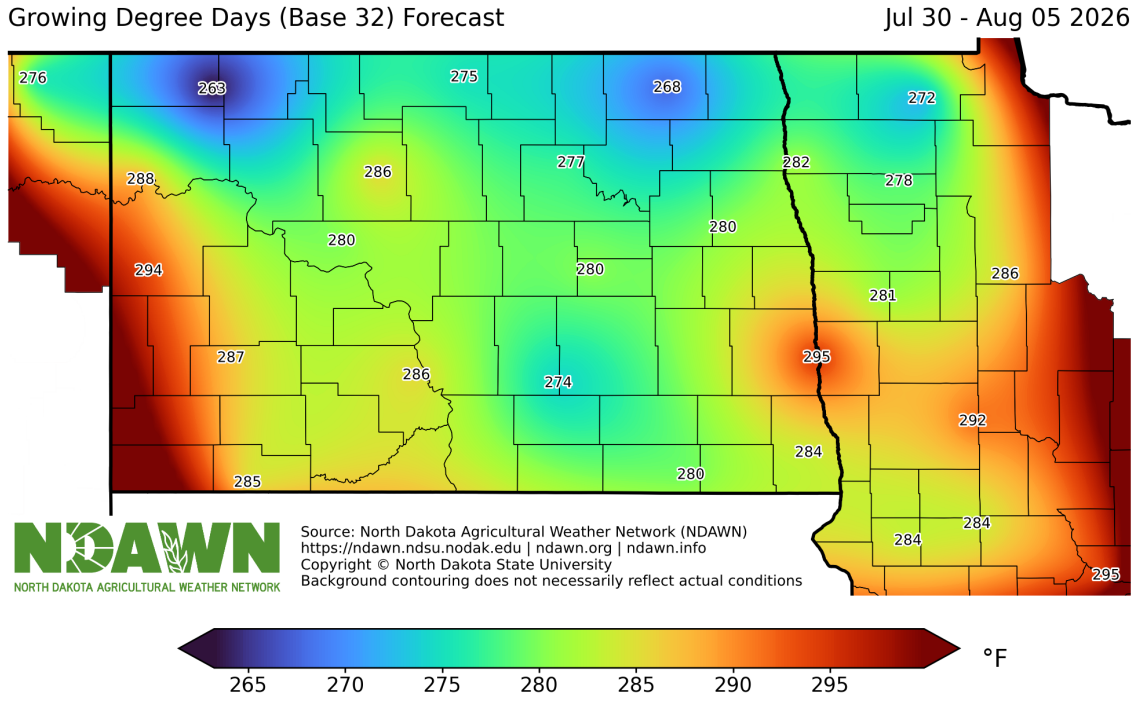

Figure 4. Estimated Growing Degree Days Base 32° for the Period of July 30 to August 5, 2026

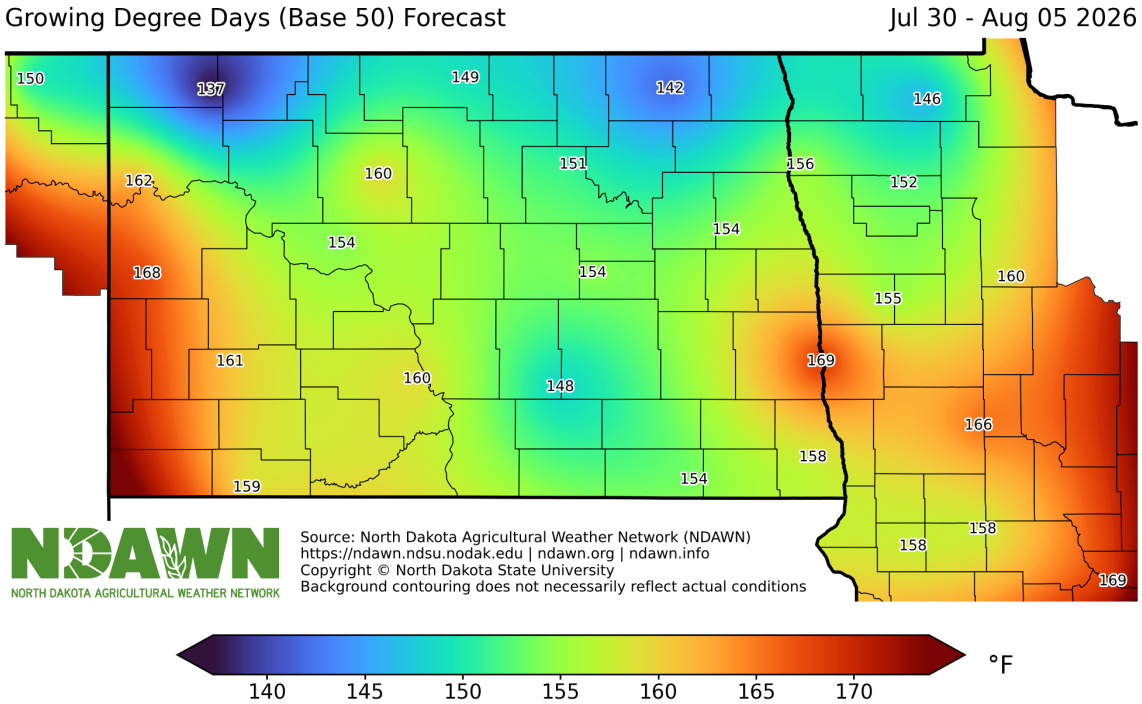

Figure 5. Estimated Growing Degree Days Base 50° for the Period of July 30 to August 5, 2026

Using May 1 as a planting date, the accumulated growing degree days for wheat (base temperature 32°) is given in Figure 6. You can calculate wheat growing degree days based on your exact planting date(s) here: https://ndawn.ndsu.nodak.edu/wheat-growing-degree-days.html

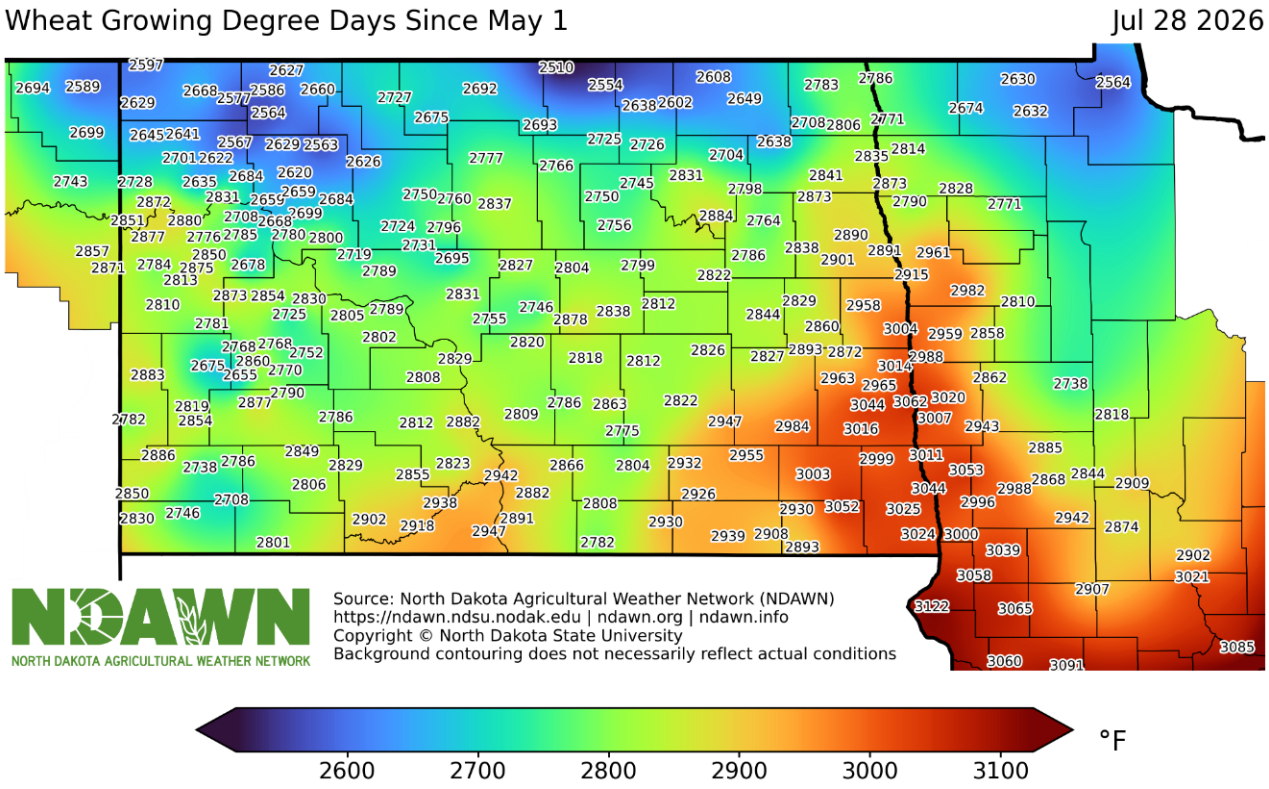

Figure 6. Wheat Growing Degree Days (Base 32°) for the Period of May 1 through July 28, 2026

Using May 10 as a planting date, the accumulated growing degree days for corn (base temperature 50°) is given in Figure 7. You can calculate corn growing degree days based on your exact planting date(s) here: https://ndawn.ndsu.nodak.edu/corn-growing-degree-days.html.

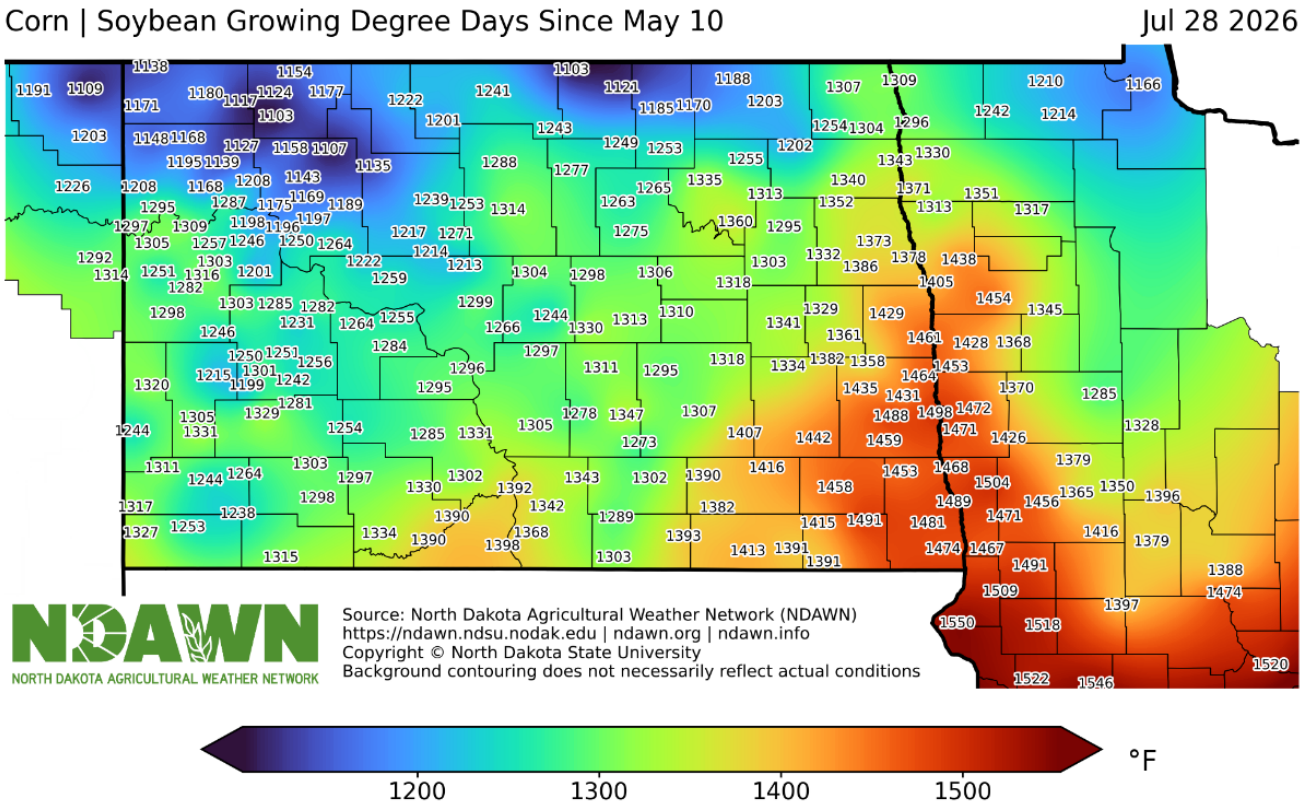

Figure 7. Corn Growing Degree Days (Base 50°) for the Period of May 10 through July 28, 2026

Daryl Ritchison
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NDSU EXTENSION

EXTENDING KNOWLEDGE ❯❯ CHANGING LIVES

This publication will be made available in alternative formats for people with disabilities upon request (701) 231-7881. This publication is supported in part by the National Institute of Food and Agriculture, Crop Protection and Pest Management - Extension Implementation Program, award number 2024-70006-43752.