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entomology

ALFALFA WEEVIL SCOUTING

Alfalfa weevil adults (Fig. 1) have emerged in North Dakota according to the degree day model for alfalfa weevil, which uses a degree base of 48 degrees F. The total accumulated degree days (ADD) for adult activity is 200 to 299 ADD ([NDAWN insect degree day map](#), next page).

Adult alfalfa weevils overwinter in shelterbelts and wooded areas outside the alfalfa field. Adults are only ¼ inch long, brown with a distinctive dark brown stripe running down the center of the back (Fig. 1). Antennae are elbowed, clubbed and the snout is blunt.

Alfalfa weevil larvae have four instar stages (growth stages). Eggs hatch at 300 ADD and first instar larvae develop from 300 to 371 ADD. First instar larvae feed on the leaves causing small pinholes from early instar larvae (Fig. 2). As larvae mature (3-4 instar larvae) more damage like heavily skeletonized leaves and even crown injury occurs. The recent moisture will help weevil damaged alfalfa fields to recover this year.

When adults and 1st to 2nd instar larvae are present (300 to 438 ADD) is a good time to start scouting for economic populations of alfalfa weevil and treat with an insecticide if necessary. In North Dakota, alfalfa weevil feeding can often be controlled by cutting alfalfa early.

Scouting should begin immediately after egg hatch, and fields should be scouted weekly up through the first cutting. A 15-inch sweep net is useful for finding adults and larvae in alfalfa fields.



Figure 1. Adult alfalfa weevil (Patrick Beauzay, NDSU)

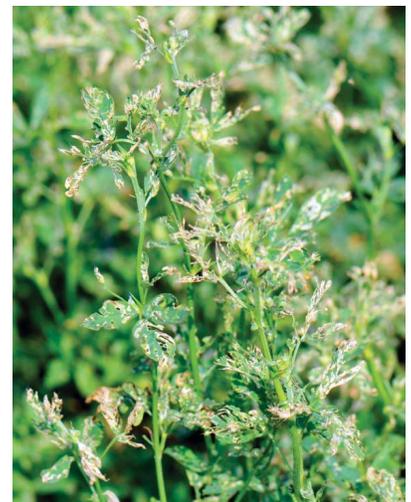
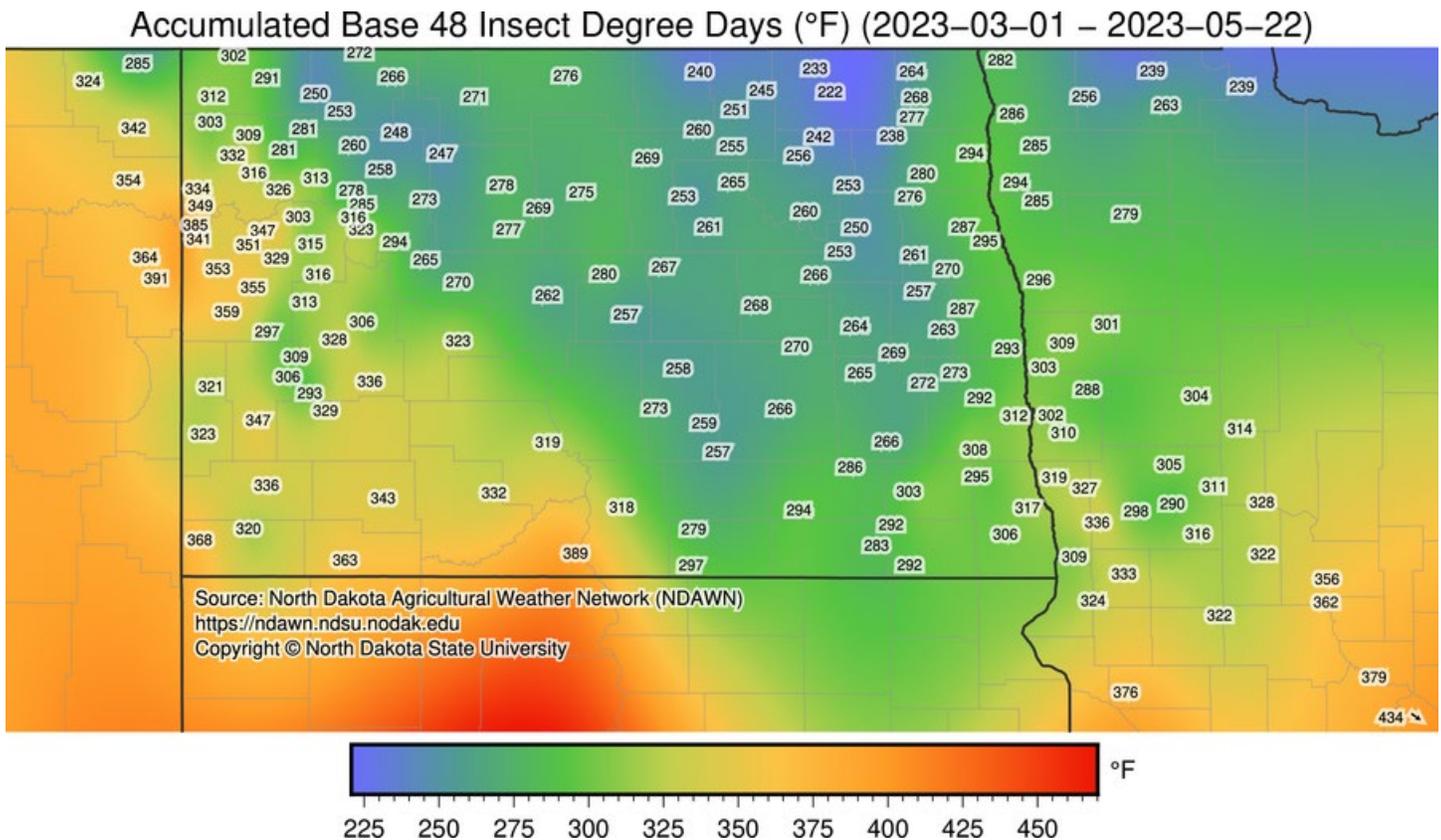


Figure 2. Defoliation caused by alfalfa weevil larvae

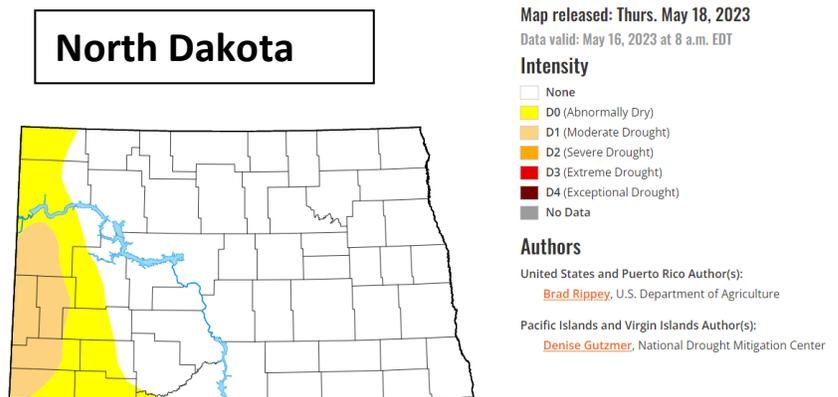
Figure 2. Current Alfalfa Weevil Degree-Day Accumulations (base 48°F) as May 23, 2023 (Source: NDAWN)



For more information on scouting and thresholds, see the NDSU Extension publication [Integrated Pest Management of Alfalfa Weevil in North Dakota E1676](#).

GRASSHOPPER FORECAST FOR 2023

Drought in North Dakota has fortunately declined to abnormally dry (yellow) and moderate drought (tan), mainly in the far western areas of North Dakota. The snow this winter and recent spring rains has improved the outlook for crop production in 2023. Grasshopper outbreaks typically occur during several years of hot drought conditions like we’ve seen in the past three years. Overall, the grasshopper forecast for 2023 should be improved for most of North Dakota, although the USDA APHIS PPQ 2023 *Rangeland Grasshopper Hazard* map (on next page) shows economic populations of adults 15+ per square yard (red) in west central and south-central areas of North Dakota. However, this map does not show other factors that affect grasshopper populations: the number of eggs laid by grasshoppers in late summer to fall and weather conditions in the winter and spring.



Scouting is important during spring nymph hatch (now) and later in the summer during adult emergence (late July through fall) in crops and rangelands. **Crop fields should be scouted at least once a week.** Since broadleaf crop seedlings (sugarbeets, sunflowers, canola, dry beans and soybeans) are more susceptible than small grains, these crops should be inspected at least twice a week. High densities of grasshopper nymphs can cause severe foliar defoliation on emerging seedling crops in a short time.

Newly hatched grasshoppers (Fig. 1) are extremely small (about the size of a kernel of wheat) and it’s difficult to count the number of nymphs per square yard when populations are high. **Newly emerged grasshoppers do not usually need to be controlled unless the population is at the “threatening” level or action threshold** (see Table 1). A sweep net is a good tool to collect and count small grasshopper nymphs. When scouting, use four 180-degree sweeps with a 15-inch sweep net, which is equivalent to the number of grasshoppers per square yard.

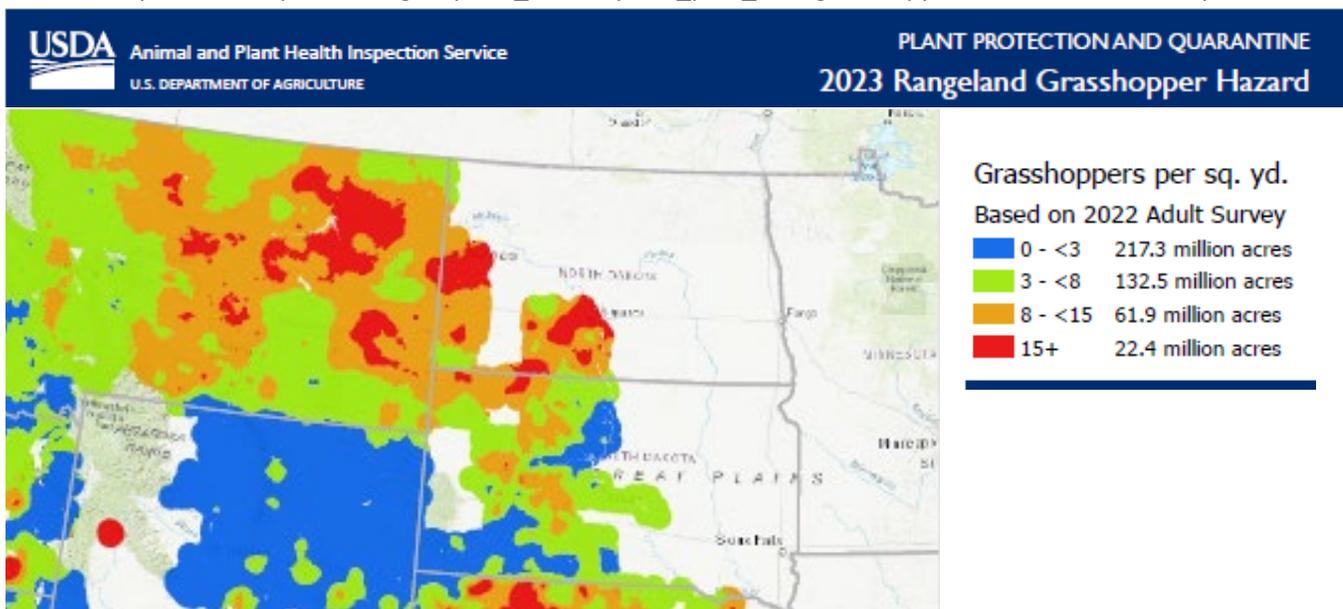


Figure 1. Grasshopper nymph. (Patrick Beauzay, NDSU Extension)

Table 1. Rating	Nymphs per square yard		Adults per square yard	
	Margin	Field	Margin	Field
Light	25-35	15-25	10-20	3-7
Threatening	50-75	30-45	21-40	8-14
Severe	100-150	60-90	41-80	15-28
Very Severe	200+	120+	80+	28+

Grasshopper nymphs are more easily and economically controlled. There are a number of advantages in treating grasshoppers early: (1) fewer acres will have to be treated and less insecticide is necessary to obtain control, thus reducing cost; (2) grasshoppers are killed before they have had the opportunity to cause significant crop loss; (3) smaller grasshoppers are more susceptible to pesticides than larger adult grasshoppers; (4) early treatment before grasshoppers reach maturity prevents egg deposition, which may help reduce the potential grasshopper threat for the following crop year.

Source: https://www.aphis.usda.gov/plant_health/plant_pest_info/grasshopper/downloads/hazard.pdf



[Janet J. Knodel](#), Extension Entomologist

RETURN PROGRAM FOR CHLORPYRIFOS CONTAINING PRODUCTS (TIME SENSITIVE)

The North Dakota Department of Agriculture has been in contact with Corteva and ADAMA about a return program for their chlorpyrifos products. Here's the information we were able to gather.

ADAMA announced a return program and Corteva AgriSciences announced a credit process for channel-owned inventory of chlorpyrifos insecticide brands:

- Cobalt, Cobalt Advanced (Corteva)
- CPF 4E (Corteva)
- Eraser (Corteva)
- Govern (Corteva)
- Hatchet (Corteva)
- Lock-on (Corteva)
- Lorsban WSP, Lorsban 15G, Lorsban 75WG, Lorsban Advanced (Corteva)
- Whirlwind (Corteva)
- Yuma 4E (Corteva)
- Chlorpyrifos 4E Ag (ADAMA)
- Vulcan (ADAMA)

To participate in *ADAMA's program*, please contact the Strategic Account Lead or Regional Account Manager at ordergroup@adama.com or call 866-406-6262 by **May 29th, 2023**.

To participate in *Corteva's return program*, please contact customer service, (Madison Siegal for packaged products USCustomerService@corteva.com or Korsen Stiner for bulk products at Korsen.Stiner@corteva.com) by **June 23, 2023** or by **September 22, 2023** or **as soon as possible**. They only anticipate two pickup dates, one in July and one in October, hence the dates.

For Corteva Products Only

Credits will be issued for the returned inventory from Corteva to the distributor. Credit will be issued by Corteva for package products within a week of the returned product arriving to a Corteva warehouse. Credit will be issued by Corteva for bulk product within a week of notification by TriRinse that disposal is complete. Corteva requests that all parties maintain records reflecting volume, brand, and date of return, as well as source of the inventory if applicable (ex: volume received in at distribution from a retail partner).

Jugs and tote returns will be taken only from distributors. When contacting customer service, please be prepared to provide a contact for each pick up location, gallons of inventory pack type, and if any partial containers are included in the volume. Partial containers should be visually assessed, and quantity should be reported to Corteva customer service.

Corteva will accept all inventory (unopened totes and jugs, partial totes and partial jugs, and bulk)

- Partial jugs must be securely capped and contained in a box for pick up
- Pallets of material must be securely shrink-wrapped
- If a recovery drum is required for opened containers, please coordinate with Corteva customer service to have one dispatched during collection.
- If utilizing a recovery drum or shrink-wrapping pallets with multiple brands in the pallet, please request a Section 17 label from your Corteva representative and affix to the drum/pallet.

Consolidation of product to fewer pickup points is appreciated where possible. Corteva will pay the freight for returns. Corteva will only accept returns of Corteva branded chlorpyrifos product; please work with the manufacturer of any other brands you have in possession.

Bulk tanks containing Corteva Chlorpyrifos brands will be serviced by TriRinse for product disposal. Distribution can arrange disposal or retail may contact Corteva customer service directly about bulk inventory – please be prepared to provide a contact for each pick up location and gallons of inventory. After customer service receives notification of bulk inventory in-channel, contact information will be provided to TriRinse, who will then contact your location to schedule product removal. Tank cleaning will also be provided if requested. Corteva will cover disposal and tank cleaning costs.

For ADAMA Products Only

Adama will cover costs for chlorpyrifos product returns if the customer has provided the necessary quantity to be returned and consolidated it to a single location for pickup by our contracted transporter. You may return partially used product.

Adama has provided customers with the following timeline for returns to expedite the process.

- Week of May 1st, 2023: Customer notification
- Week of May 29th, 2023: Customer to send completed Product Return Sheet. You can fill the Product Return Sheet by visiting <https://www.surveymonkey.com/r/BHZN6Z2>
- Week of June 5th, 2023: ADAMA Customer Service determines pickup logistics
- Week of June 19th, 2023: ADAMA Customer Service notifies return contact of pickup date
- Weeks of June 26th through July 17th, 2023: Product picked up from customer location
- Weeks of July 24th through August 7th, 2023: Product incineration
- Week of August 14th, 2023: EPA notified of completion of return program and product disposal

Reach out to ADAMA Customer Service at ordergroup@adama.com or 866-406-6262 for more information. Customer Service is coordinating the return process. Additionally, customers may also reach out to their Strategic Account Lead or Regional Account Manager for questions as they arise.

Background

In August 2021, the US Environmental Protection Agency announced it would revoke all tolerances of chlorpyrifos, which establishes the amount of pesticide that is allowed on food. The Final Rule was effective October 29, 2021, with tolerances for all commodities expiring on February 28, 2022. Since then, **registrants for agricultural-use chlorpyrifos products have voluntarily removed their registration from the state of North Dakota for these products and they are now illegal for use in our state.** To search North Dakota's pesticide registration database to find which products are legal for use in North Dakota, visit <http://www.kellysolutions.com/nd/pesticideindex.asp>

[Aubrey Sondrol](#)

Pesticide Outreach Specialist
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plant pathology

ASSESSING FUNGAL LEAF SPOT RISK IN WHEAT

Fungal leaf spots in wheat are the collective term given to tan spot *Stagonospora nodorum* blotch (SNB) and *Septoria tritici* blotch. Although all three can be found in North Dakota, IPM survey efforts have indicated the most common fungal leaf spot is tan spot (Figure 1), followed by SNB. Over the past five years, survey efforts have indicated the prevalence of tan spot has lessened in the state. This is likely attributed to differences in weather across growing seasons, availability of host resistance in most hard red spring wheat varieties, and the popular use of a fungicide-herbicide tank mix as an early season crop protection spray in wheat.



Figure 1. Lower leaves of winter wheat at the heading stage. Note several tan spot lesions with ellipsoid shape, tan center, and yellow halo.

Here are a couple factors to help determine tan spot and SNB risk in your field.

1. **Host resistance** – The availability and incorporation of host resistance has come a long way compared to the 1990s. There is a range of susceptibility in hard red spring wheat (HRSW) and hard red winter, but several have a good level of host resistance. Use the NDSU Hard Red Spring Wheat Selection Guide (A574-22) and the NDSU Hard Red Winter Wheat Selection Guide (A1196-22) to determine susceptibility of a variety.

- Previous Crop and Residue Management** – The cropping sequence and availability of wheat residue in a planted field are the most important factors to determine fungal leaf spot risk. Both the tan spot and SNB pathogen overwinter on wheat residue (Figure 2A) and release spores during the spring. One of the biggest reasons we tend to see more tan spot in winter wheat is because of the choice to use wheat-on-wheat in a no-till or reduced till system (Figure 2B). Whereas if you are planting wheat after a soybean crop with conventional tillage, fungal leaf spot risk is drastically reduced. Both sexual and asexual spores can travel by wind, but the closer the proximity of a wheat plant is to a spore source, the greater the chance for infection.

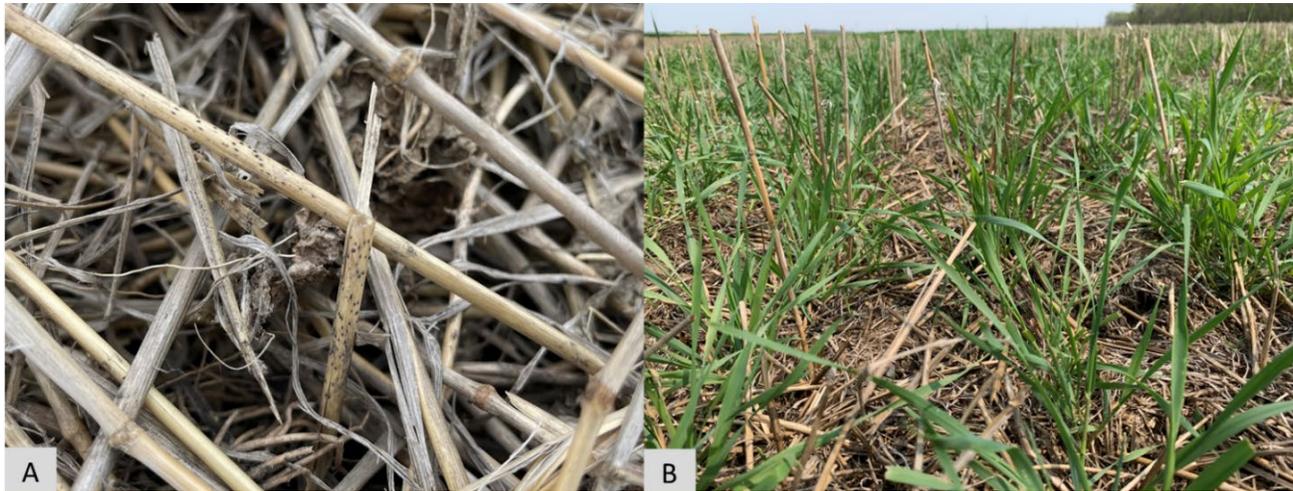


Figure 2. (A) Wheat residue with black fruiting bodies (pseudothecia) of the tan spot fungus. (B) Winter wheat field planted into no-till spring wheat residue (Photo by: Greg Endres).

- Weather** – Disease epidemics are heavily influenced by weather conditions. Conducive conditions for tan spot and SNB include a wide temperature range (68-80 F) and prolonged periods (6 to 24 hours) of wet conditions such as dew and rain. One way to help visualize conducive periods for tan spot and SNB is through the NDSU Small Grain Disease Forecasting Model (<https://www.ag.ndsu.edu/cropdisease>). The scout-based model is best used after tan spot or SNB has been detected in a field, however it does provide the environmental parameters to indicate if a day was favorable for pathogen infection (Figure 3).

Carrington - Flagging

May 23, 2023

Infection periods of tan spot, Stagonspora (Septoria) blotch and leaf rust

Interpretation: Yes = infection likely, No = infection unlikely. First, select the date when 50% of the flag-2 (or flag-1) leaves had disease symptoms. Then, consider a fungicide when 6-8 infection periods ("Yes" days) have accumulated. [\(More\)](#)

Model	5/22	5/21	5/20	5/19	5/18	5/17	5/16	5/15	5/14	5/13	5/12	5/11	5/10
Tan Spot	Yes	No	Yes	No	Yes	Yes							
Blotch	No	Yes	No	No	No								

Weather

Interpretation: Factors that most influence plant diseases are given here to help you mentally adjust for environmental differences between your field and the weather station. More complete environmental information from NDAWN, the latest doppler radar image, and one of many weather forecasting services are linked below. [\(More\)](#)

	5/22	5/21	5/20	5/19	5/18	5/17	5/16	5/15	5/14	5/13	5/12	5/11	5/10
Rain (in)	0	0	0	0	0.01	0	0	0	0.04	1.06	0	0	0.02
RH (%)	56	53	53	63	72	55	53	56	74	82	60	72	80
Temperature (F)	66.0	64.5	56.6	46.9	55.4	66.7	65.0	63.0	58.9	64.4	68.6	66.3	59.6
Wet period (hour)	8	4	1	2	4	3	1	2	1	14	0	6	6

Figure 3. Infection periods (yes or no) for tan spot and SNB and the corresponding weather factors for Carrington using the NDSU Small Grain Disease Forecasting Website. A value of 'yes' does not automatically guarantee an infection event occurred and the model is best used for late-season scouting after a tan spot or SNB has been detected.

[Andrew Friskop](#)

Extension Plant Pathology, Cereal Crops



GETTING-IT-RIGHT CROP PRODUCTION RECORDINGS AND RESOURCES AVAILABLE

Farmers and crop advisers had an opportunity to participate in soybean, sunflower, corn, canola and dry bean “Getting-it-Right” virtual meetings during the winter meeting season. The recordings of those meetings, conducted by North Dakota State University (NDSU) Extension in cooperation with the respective commodity groups, are available at <https://www.ndsu.edu/agriculture/ag-hub/getting-it-right>. The virtual meetings provided concise presentations to educate participants with research-based production recommendations for the 2023 growing season. Topics covered in

the meetings included cultivar performance; plant-growth stages; plant establishment; plant nutrition and soil management, weed, disease and insect management; an overview of crop markets.

In addition to the video presentations, specific crop-related educational resources to supplement the information from the presentation are available at the Getting it Right [web site](#). This link also provides access to the 2021 and 2022 Getting-it-Right meeting series videos that also include presentations on flax production.

2023 Getting It Right Soybean Production Series

1 2023 Getting It Right Soybean Production Series: ND Soybean Council welcome with Miki Miheguli
NDSUCREC • 85 views • 5 months ago

2 2023 Getting It Right Soybean Production: Variety Selection and Research Update with Hans Kandel
NDSUCREC • 105 views • 5 months ago

3 2023 Getting It Right Soybean Production: Plant Establishment with Greg Endres
NDSUCREC • 122 views • 5 months ago

Videos of each "Getting it Right Production Series" speaker are individually available for viewing.

[Hans Kandel](#)

Extension Agronomist Broadleaf Crops

[Greg Endres](#),

Extension Cropping Systems Specialist



THE WAR AGAINST WEEDS PODCAST

Many folks around the state are finally getting some cab time in while spraying, planting, scouting, etc. For those who enjoy listening to podcasts, I am a co-host of one focused all about weeds and their control. The War Against Weeds is a podcast hosted by myself, along with my colleagues at Kansas State University (Dr. Sarah Lancaster), and The Ohio State University (Dr. Alyssa Essman). We cover a diverse set of topics all related to weeds. Each episode typically has a guest host with expertise in that episode's topic. I like to say that not every episode is for everyone, but there is an episode for everyone.

Episodes are typically about 30 minutes in length. We currently have five seasons (about 75 full length episodes) of content posted online (<https://waragainstweeds.libsyn.com/>). The podcast can also be accessed using phone apps like iTunes, Google Play, and Spotify. So, if you have some cab time and want to listen to some Weed Science topics, feel free to check it out.



[Joe Ikley](#)

Extension Weed Specialist



Stem of a young bur oak tree that's been girdled by woodpeckers that are feeding on insect larvae.

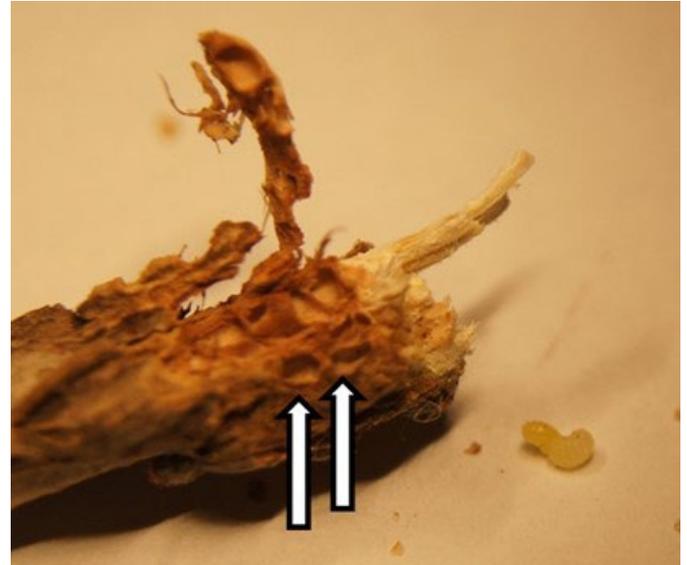
BUR OAKS, BUGS AND BIRDS—REVISITED

Since about 2006, we have occasionally seen damage to young bur oak trees from woodpeckers. The damage is highly variable, but at its worst, some trees have been mostly girdled or had the main stem killed. The birds are not to blame, however, as they have been searching for a tasty meal – insect larvae located within the bark. We believe the insect is a stingless wasp with the scientific name *Callirhytis flavipes*; it does not yet have a common name. (The scientific name for this insect may have changed to *Bassetia flavipes*, but I'm no taxonomist.)

The birds seem to be focusing on young trees, those with stem diameters from 1 to about 8 inches (at 4.5 feet above the ground). Larger trees may be affected as well, but the damage on those trees seems to be less severe. Some trees have escaped with no damage at all, especially those trees with smoother bark. Nearby trees may have destruction up-and-down the entire stem. The prevalence of this problem is pretty variable. We generally see a few cases each year, somewhere in the state, but it hasn't been a big problem in any one area for a long time. Examples have been seen throughout the state as far west as Mercer County. We haven't heard of any problems in conservation (shelterbelt) plantings, but it is definitely a possibility.



This tree was infested with insects a few years ago, which were then fed on by woodpeckers. The dead leader and limbs caused by that first infestation were pruned from the tree, creating poor structure. Insects re-infested the tree again in 2013 and in 2016.



Larva of Callirhytis flavipes found in a bur oak tree. Woodpeckers that feed on the insect are causing major damage to young bur oaks. Note the smooth chambers in the bark, that housed more larvae (arrows).

In a heavily infested tree, the main leader can be killed, which then must be pruned out. The result is a tree with poor structure that is stressed and might not survive in the long term. Some trees have been attacked more than once, and are damaged to the point that they must be removed. Unfortunately, the only recommendation that we have at this point is to prune out dead branches. Control methods still have not been developed. While systemic insecticides might offer some level of control, no research on this topic has been published. The latest research has focused on several parasitoids that can attack *C. flavipes*. A healthy parasitoid community may explain the apparent population swings that we've seen with this insect. A product called Tanglefoot Bird Repellent may deter birds from digging into the tree bark; however, since the birds don't feed on the trees until winter, applying the product right now will not help.

[Joe Zeleznik](#)

NDSU Extension Forestry Specialist



horticulture

THE MESSY AND CONTROVERSIAL SCIENCE BEHIND NO MOW MAY

No Mow May is a popular conservation movement to encourage people to abstain from mowing their lawns during the month of May. The stated purpose is to allow weeds to grow and flower in the lawn to provide nectar and pollen to nourish early season pollinators such as bees and butterflies.

People are surprised that NDSU Extension isn't promoting this practice. Our organization normally encourages pollinator-friendly conservation practices. However, No Mow May lacks scientific support and is even considered controversial.

No Mow May is a British pollinator movement that was embraced by the town of Appleton, Wisconsin. Numerous Wisconsin residents pledged to forego spring mowing. Seeing an opportunity, Lawrence University researchers decided to study this phenomenon. The researchers compared the pollinator species diversity and abundance between unmowed residential lawns and mowed park land. They published a study showing that unmowed residential lawns attracted more bee species and larger quantities compared to the mowed park land.

The Lawrence University research study was published and received a huge amount of national press including an article in the New York Times. Consequently, many communities across the country adopted No Mow May. Then an unexpected development occurred. On November 18, 2022, the original research study was retracted due to "several potential inconsistencies in data handling and reporting."

Scientific journals rarely retract articles that have been published. Admittedly, I had my doubts on No Mow May for other reasons. I frequently lecture on turfgrass management practices and was concerned that foregoing mowing for an entire month would damage lawns right before summer. One important rule of thumb for growing healthy lawns is to never trim off more than 1/3 the height of your turfgrass at one time. For example, if you allow your lawn to grow 4.5 inches tall, the maximum length that can be removed at one time is 1.5 inches leaving a 3-inch tall lawn.

No Mow May violates this rule because lawns may grow 12 inches or more during the month. Trimming a 15-inch lawn down to 3 inches on June 1 shocks the turfgrass plants. Even worse, this stress is imposed right before summer and therefore, the lawn is less able to handle heat and drought.

A second concern is that few homeowners have mower equipment that can handle tall grass. Consequently, deep swaths of "hay" will be left on the lawn when homeowners mow in June. Excessively long clippings may smother the lawn and will need to be raked up thereby depriving the lawn of the nutrients from the clippings.

A final concern is that No Mow May mostly results in blooming dandelions. Yes, many pollinator species visit dandelions for their nectar. However, recent research has shown that dandelion pollen is deficient in important amino acids.

If you want to support pollinator conservation, there are better methods for doing so. Consider installing a pollinator garden using nectar- and pollen-rich plants. Plant spring flowering trees and shrubs. If you want to make your lawn more sustainable, consider planting a bee lawn that includes Dutch white clover. For more information on pollinator-friendly practices, please visit the [NDSU Extension Pollinator Conservation Facebook](#). (Reproduced with permission from Dakota Gardener).

[Esther McGinnis](#), Extension Horticulturist



around the state

NORTHEAST ND



Planting canola trial at the Langdon Research Extension Center. Photo: Anita Chirumamilla

Plantings are progressing well all over the region. Approximately 50% of the acres have been planted. Majority of the small grains, field peas and corn acres were planted. Soybean and canola plantings are a priority this week. Farmers are working long hours to plant as many acres as possible. Early planted small grains and corn are emerging and are in 1-2 leaf stages. Dry beans and sunflowers will be planted next week.

The NDAWN data shows that the NE region received around 0.12-0.32 inches of rain last week helping the dry top soil. The soil moisture at Langdon NDAWN station shows 13.7%-20.5% of moisture in the top 2-4 inches.

The warm temperatures and rain events are helping the grasshopper hatches. Baby grasshoppers are found jumping around the field edges and grassy ditches. Canola flea beetles are still emerging strong with a slight increase in striped flea beetle numbers this week compared to the crucifer flea beetles.



Crucifer and striped canola flea beetles feeding on volunteer canola; Dead canola seedling from flea beetle feeding damage. Photos: Anita Chirumamilla

Due to dry conditions, white saline spots are showing up in the low spots and head land areas. The recommendation is to not to till/plant these areas with salt-sensitive crop like soybeans, as they are unproductive and there is no return on your input costs. Instead, choose salt-tolerant crops like barley and oats or perennial salt-tolerant grasses to cover these spots. Weeds like kochia, lambsquarters, field pennycress, wild buckwheat, and common mallow are emerging.



Wild buckwheat and kochia seedlings; common mallow seedling
Photos: Anitha Chirumamilla

[Anitha Chirumamilla](#)

Extension Cropping Systems Specialist
Langdon Research Extension Center

NORTHWEST ND

Western ND experienced freezing temperatures last week. Areas in Divide, McKenzie, Williams, Mountrail, and Burke counties experienced very low temperatures in the early morning hours of Friday last week. As per NDAWN, freezing temperatures at 32°F and below were observed between 1:00 am to 6:00 am in a lot of areas in the five northwestern counties. The temperatures were 6 to 12°F lower than the 5-year average lowest temperature for that same day. The lowest temperatures recorded were 27°F at 5:39 am in McKenzie County and 28°F at 5:00 am in Divide County. Questions arise as to the freezing damage of such cold conditions and possible damage to emerged crops such as canola. Freezing injury occurs when ice crystals form from within plant cells that rupture of cell organelles, membranes, and cell walls. A combination of factors can lead to crop injury such as the intensity and duration of the freezing temperature, moisture conditions, rate of thawing, growth stage of the plant, and the amount of cold hardening (acclimation) the plants experienced. The extent of damage can be determined 4 to 10 days after the frost event. Finding green regrowth at the growing points could mean recovery and replanting may no longer be needed. However, several more days are required for the survived plants to reach maturity. An article from the Canola Council of Canada discusses more about frost tolerance of spring seeded canola. To know more about frost damage to spring canola, please read more from the short article which can be found through this link, [Frost Tolerance of Spring Seeded Canola | NDSU Agriculture and Extension](#).

Most fields in the northwest region have been planted, with only a few acres left to be planted. Planting and putting down PRE and/or burndown herbicides has been the major field activities in the past week. Alfalfa and early seeded small grain and broadleaf crops continue to emerge and grow well which benefited from the substantial rain from two weeks ago. Fertilizers have also been applied. The past days have been hazy due to fires from up north in Canada and also at times have been cloudy, but temperatures have climbed up fast over the weekend. In this past three days (May 20 to 22) daytime temperatures averaged in the upper 70s to lower 80s°F and night time temperatures averaged in the upper 40s and early 50s°F across the northwest areas, as per NDAWN data. Bare soil temperature at the 4" depth averaged in the 60s°F across the region. As of this report, the weather forecast predicts a warm and hazy Wednesday with scattered rain showers and much higher chances of rain come Thursday and Friday which would help incorporate the applied fertilizers and newly planted fields.



Spring wheat planted into canola stubble in Mountrail county.



Pea planted into a sandy loam soil in Williams county.



Field with alfalfa-grass mix in McKenzie county.



Fertilizer applied in spring wheat planted into flax stubble in McKenzie county.

[Charlemagne "Charlie" Lim](#)

Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

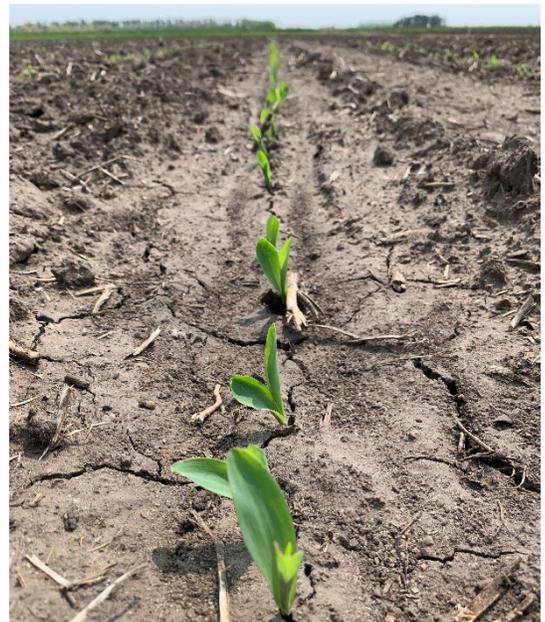


Barley nearing 3-leaf stage with an emerging tiller

According to NDAWN, rain received during May 1-22 ranges from 1.4 inches (Finley and Hope) to 4.8 inches (Jamestown), with the Carrington Research Extension Center (CREC) receiving 3.7 inches. The wettest areas generally are along the Highway 281/52 corridor. Despite excess soil moisture challenges, most farmers are making reasonable planting progress with small grain, corn and soybean. If we can avoid rain during the balance of the month, including Memorial Day weekend, most farmers should be comfortable with the amount of crop in the ground.

Early May planted barley and spring wheat are nearing or are at the initial tillering stage (3 leaf). The primary root system is starting to develop from the crown (located about 0.75 inches below the soil surface). Any management to provide adequate topsoil moisture for development this crown root system will pay benefits during the life of the cereal crop. The first yield factor, number of heads per acre, is being determined by main stem and tiller number. Head size is determined at the 4-leaf stage – temperatures in the low 70s or less will give us larger spikes. Starting in late June through early July, the other yield factors of seeds per head and weight per seed will be determined.

Mid-May planted corn has quickly emerged (e.g. about 10 days from planting to emergence with CREC trials). Unfortunately, the good crop emergence conditions (warm and moist soils) have also been good for abundant populations of annual weeds including foxtail, kochia, common lambsquarters and pigweed species.



Corn in the VE stage (planted at CREC on May 12; picture taken May 22).

[Greg Endres](#)

Extension Cropping Systems Specialist
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WEATHER SUMMARY AND OUTLOOK FOR MAY 25 THROUGH MAY 31

Last week was mostly dry, with the bulk of the rainfall occurring from Tuesday through Wednesday (Figure 1). Eastern ND and northwest MN between I-94 and US Highway 2 received anywhere from 0 to over 1 inch of rain. NDAWN stations near Mohall and Minot received about 0.5 inch - this area received over 3 inches the week prior. NDAWN stations near Beach and Sentinel Butte in Golden Valley County, ND received 0.27 inches and 0.75 inches, respectively. This area is still in moderate drought. The new [drought condition report](#) will be issued by 11:00 this morning.

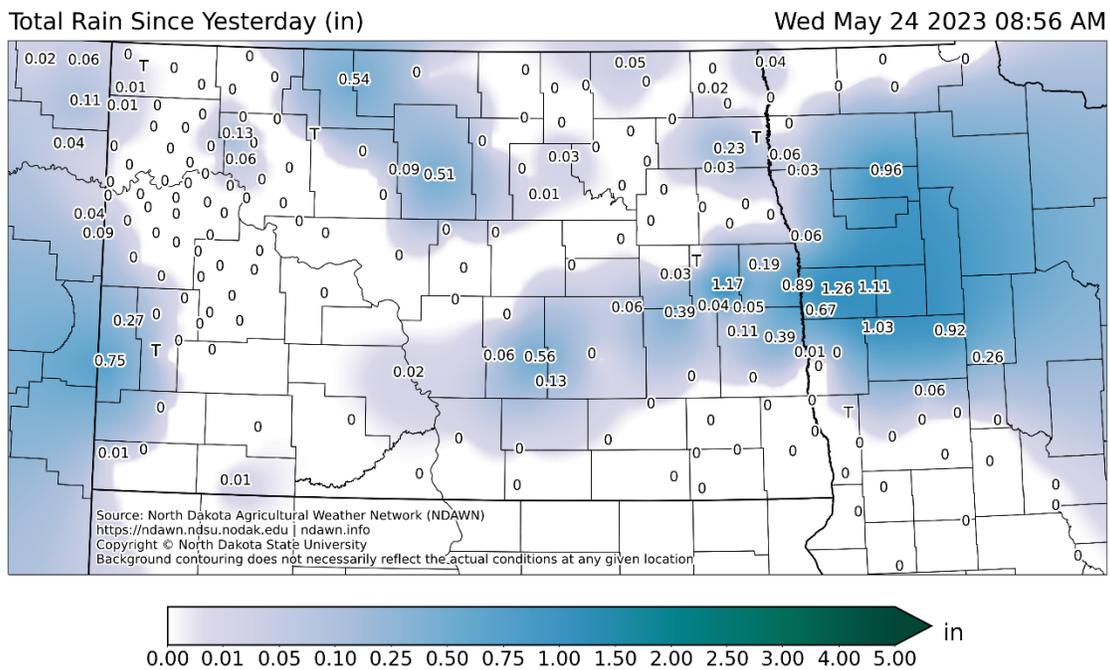


Figure 1. Total rainfall from May 23 through May 24 at NDAWN stations.

Average air temperatures were warmest in eastern ND and western MN (Figure 2). I'll summarize temperature and precipitation, including departures from normal, for the month of May in next weeks issue of the *Crop & Pest Report*.

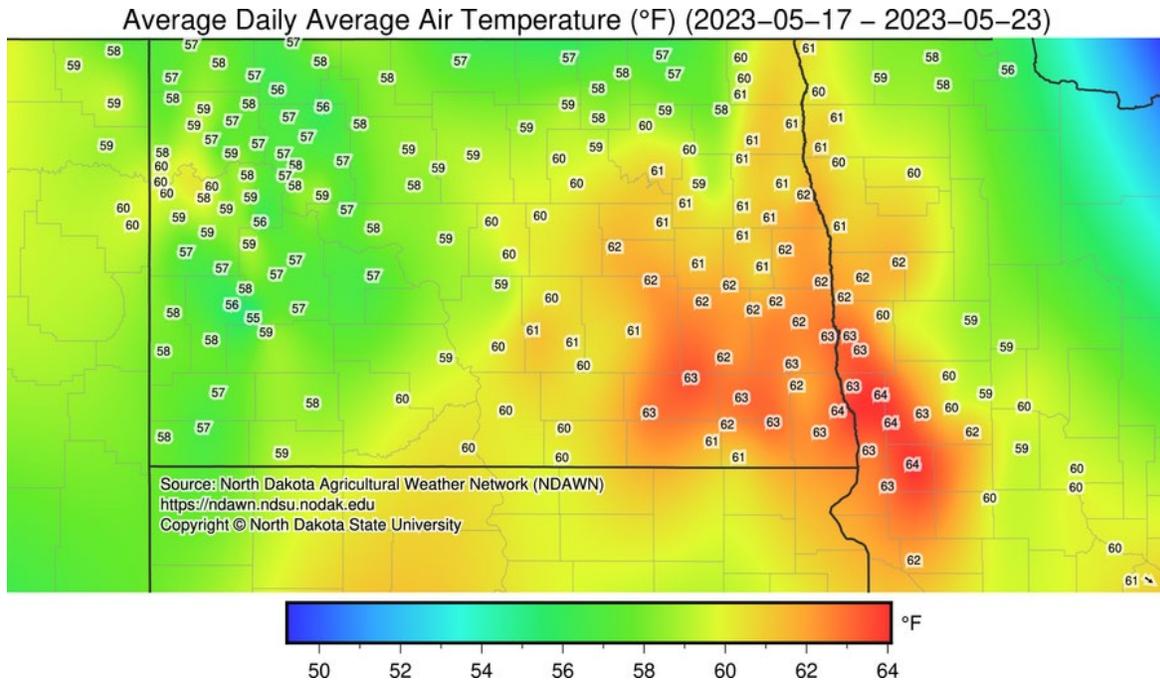


Figure 2. Average daily air temperature from May 17 through May 23 at NDAWN stations.

Soil moisture at the 4-inch and 8-inch depths appear to be largely at optimum levels across reporting NDAWN stations (Figures 3 and 4). Keep in mind that these values are recorded at NDAWN stations and may not reflect conditions at your specific locations.

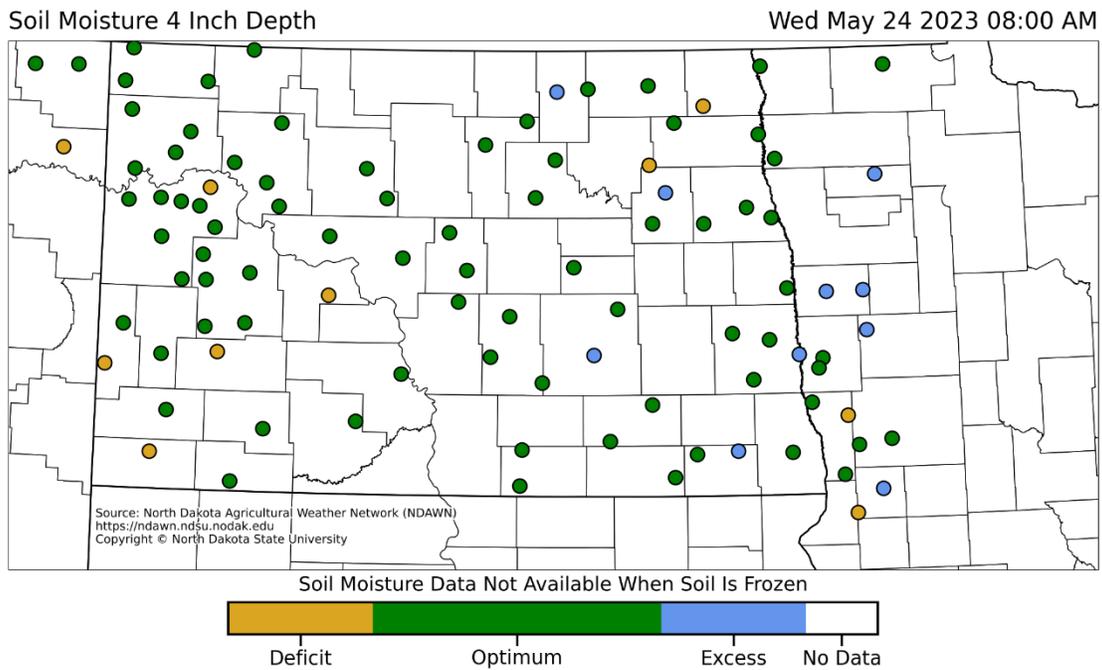


Figure 3. Soil moisture at 4-inch depth at 8:00 a.m. CDT on Wednesday May 24, 2023 at NDAWN stations.

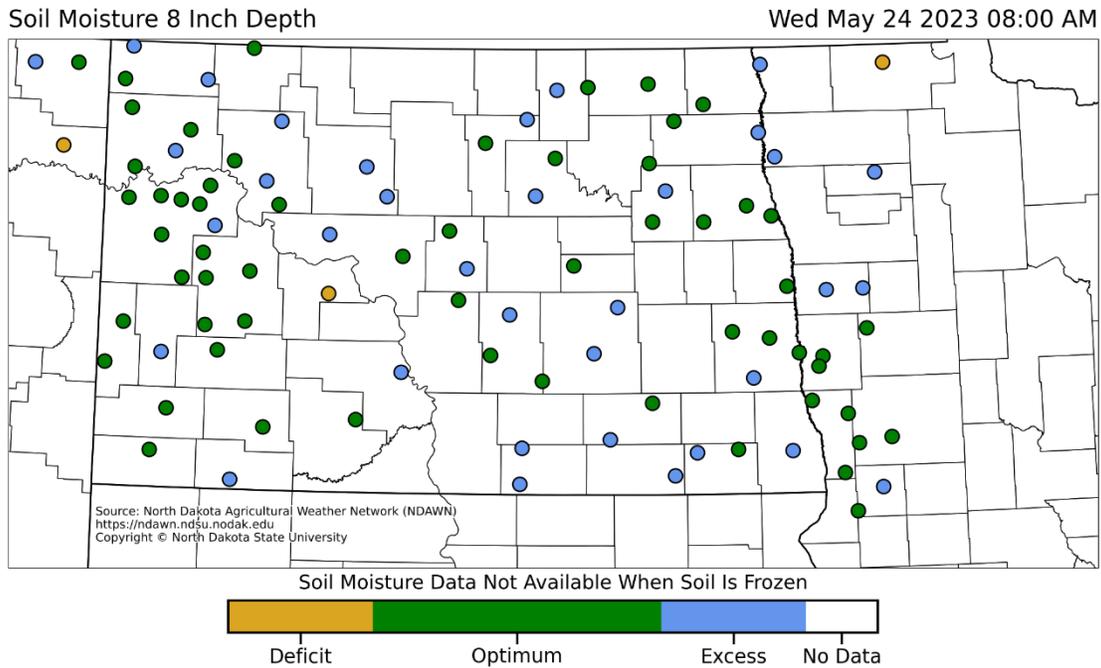


Figure 4. Soil moisture at 8-inch depth at 8:00 a.m. CDT on Wednesday May 24, 2023 at NDAWN stations.

Accumulated growing degree days (GDD) for wheat using base 32°F and a planting date of April 20, and GDD for corn and soybeans using base 50°F and a planting date of May 1 are depicted in Figures 5 and 6. We're ahead of normal for accumulated GDD for both wheat and corn/soybean using these planting dates (Figures 7 and 8).

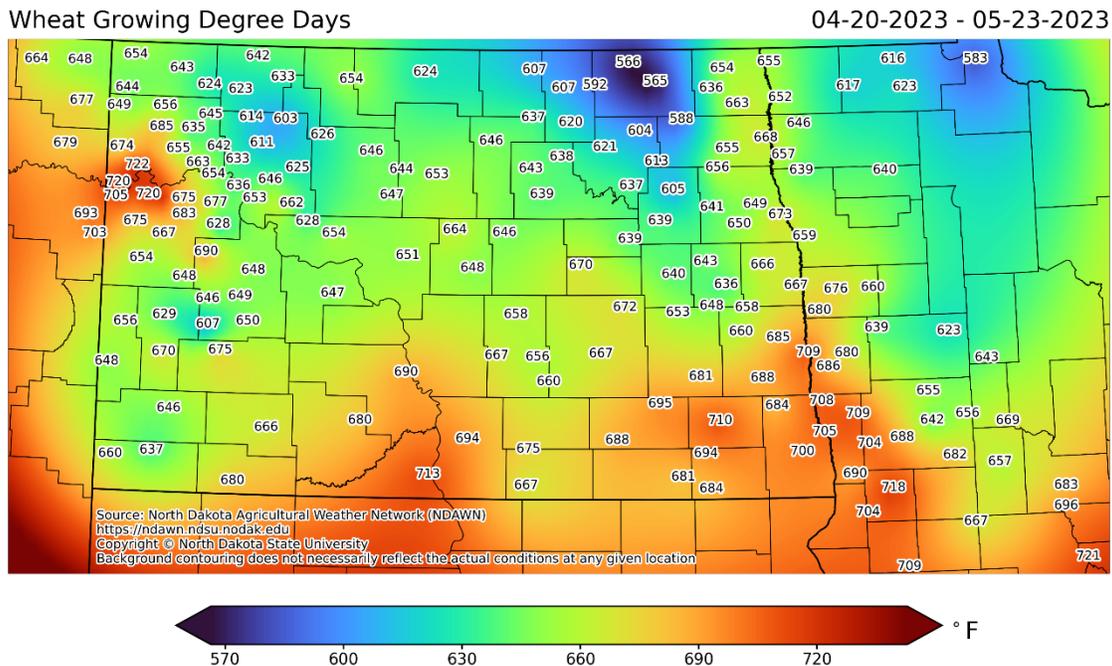


Figure 5. Wheat growing degree days from April 20 through May 23 at NDAWN stations.

Corn | Soybean Growing Degree Days 05-01-2023 - 05-23-2023

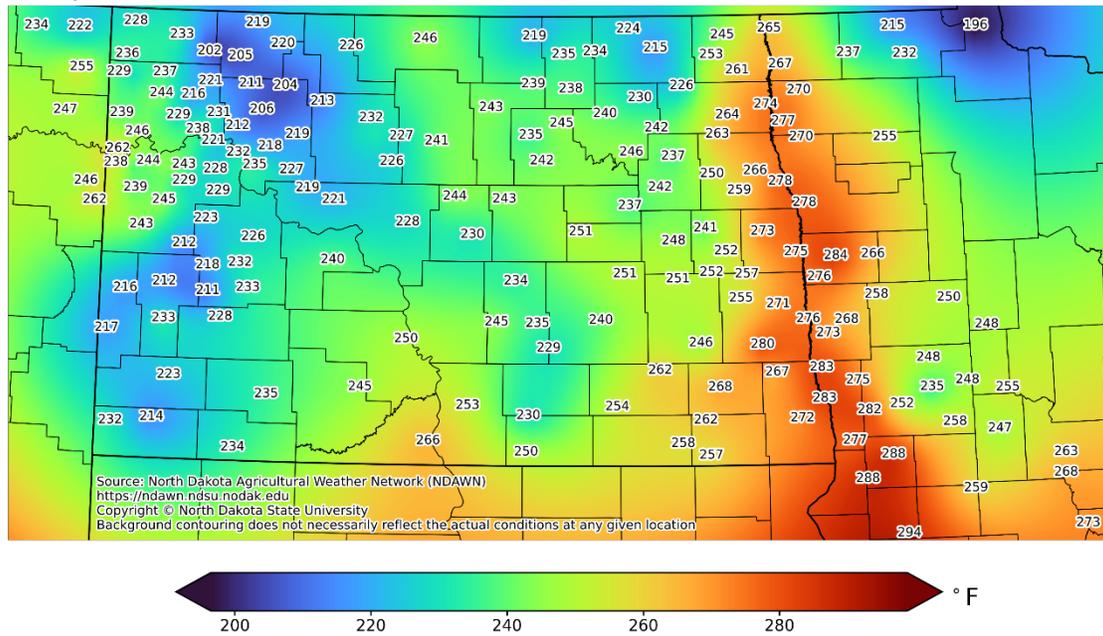


Figure 6. Corn and soybean growing degree days from April 20 through May 23 at NDAWN stations.

Departure from Normal Wheat Accumulated GDD (°F) (2023-04-20 – 2023-05-23)

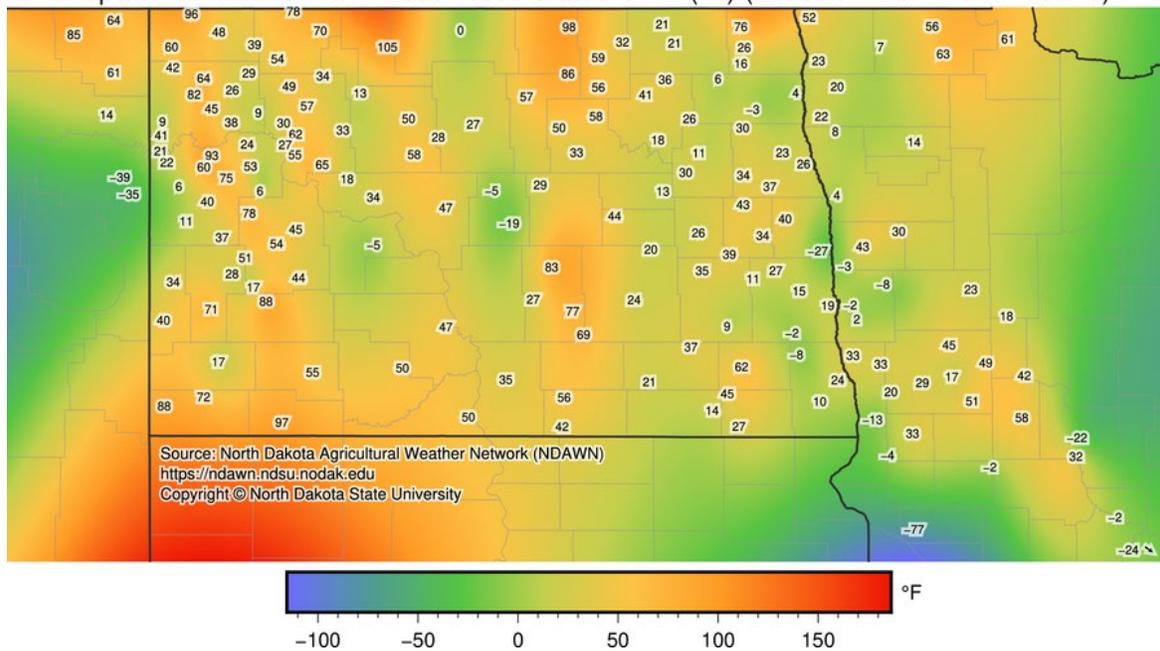


Figure 7. Wheat growing degree days departure from normal from April 20 through May 23 at NDAWN stations.

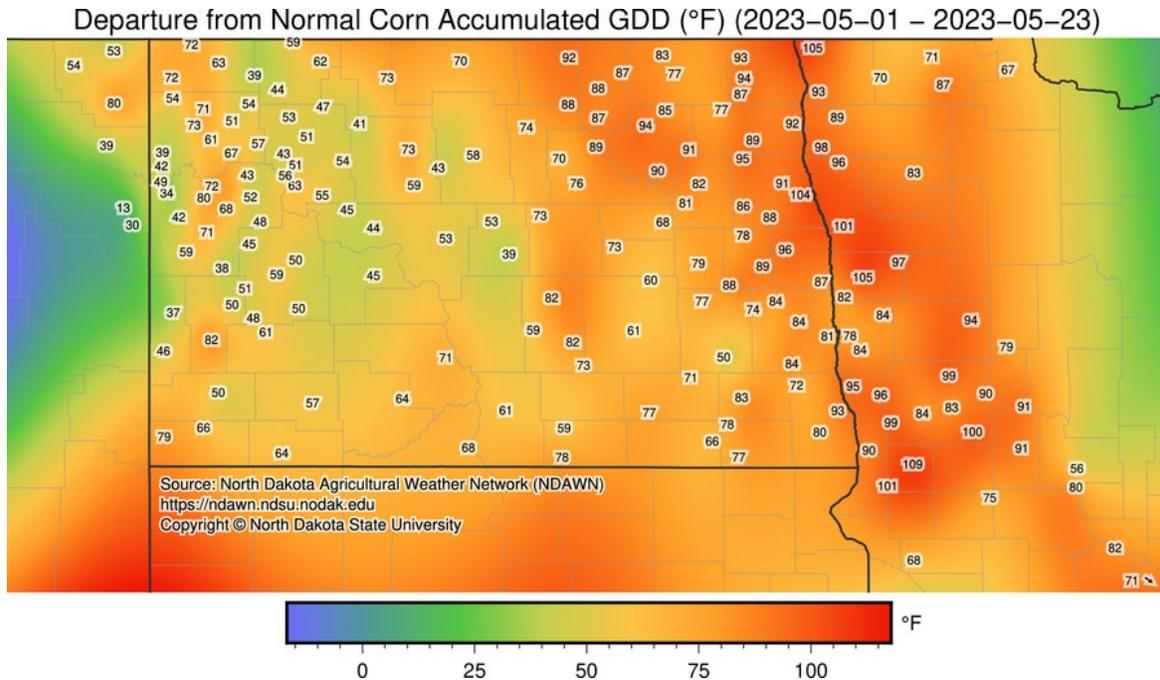


Figure 8. Corn/soybean growing degree days departure from normal from May 1 through May 23 at NDAWN stations.

Outlook for the Week Ahead

A stubborn high pressure ridge over the Great Lakes, along with a low pressure trough to our west will result in a southwesterly flow over our region, bringing unsettled weather especially to western and central ND at least through Memorial Day. The pressure gradient between the trough and ridge will result in windy conditions as well. The 7-day rainfall forecast is depicted in Figure 9. High temperatures will be near 80° west and mid-80°s east, with lows in the 50°s to low 60°s statewide.

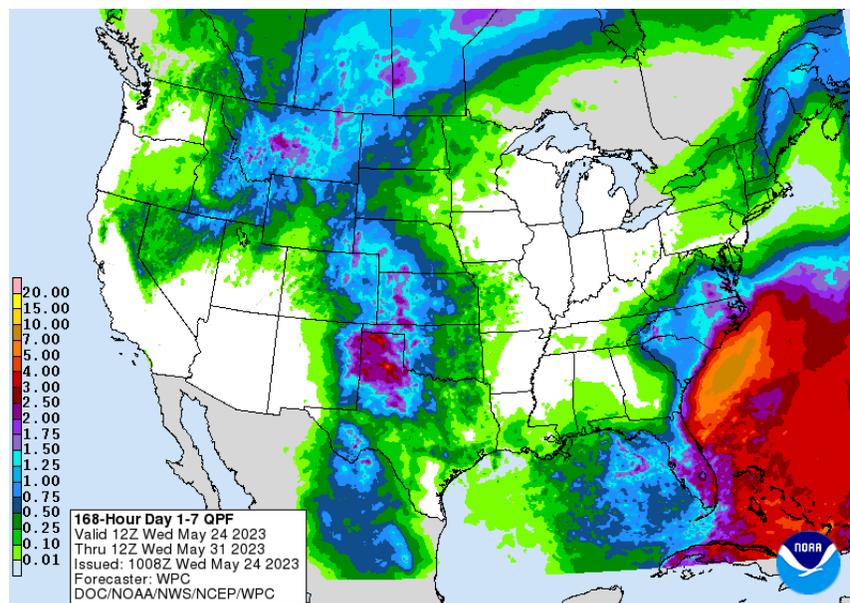


Figure 9. Precipitation potential for the continental United States from 7:00 a.m. CDT May 24 through 7:00 a.m. CDT May 31.

For the period from May 29 through June 2, precipitation looks to be near normal and temperatures will be above normal (Figures 10 and 11).

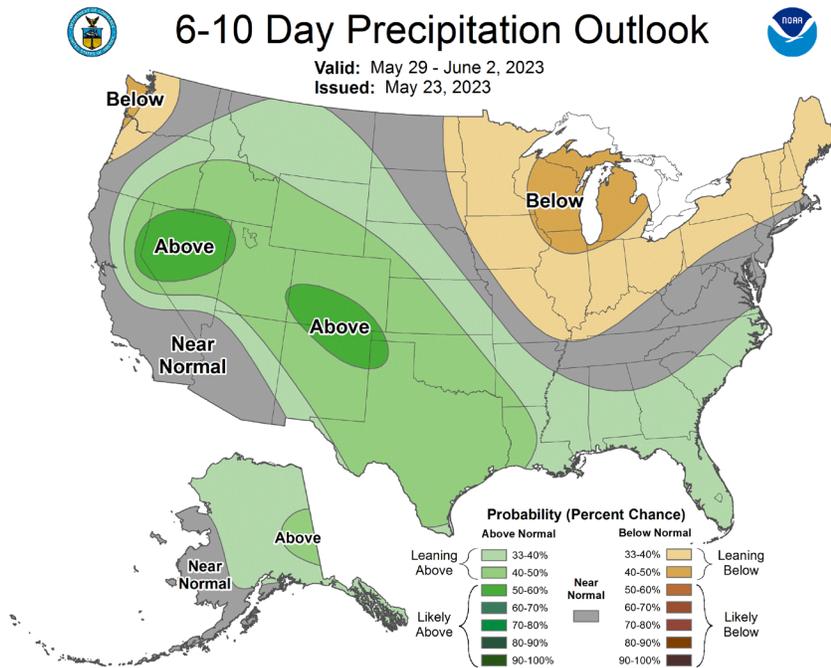


Figure 10. Precipitation outlook from May 29 through June 2 for the continental United States and Alaska.

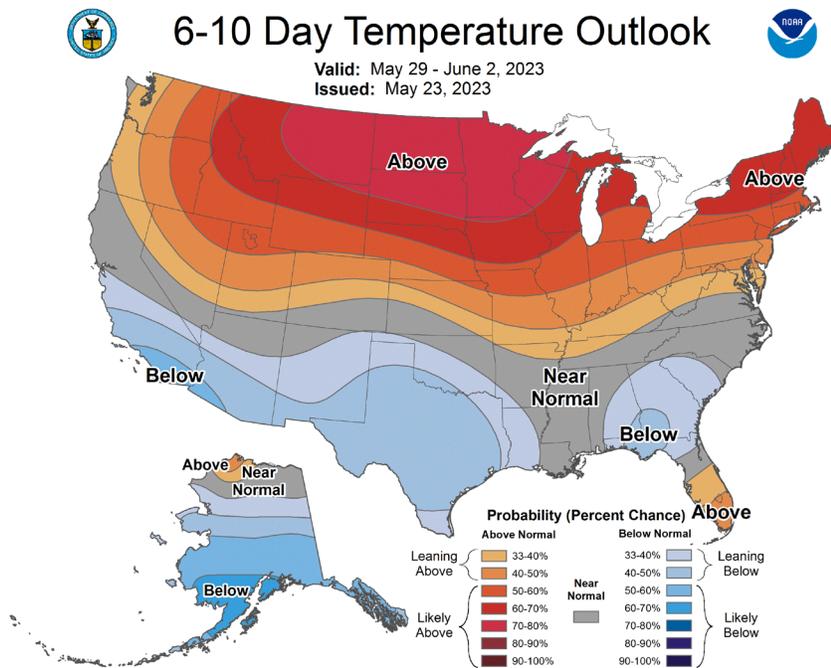


Figure 11. Temperature outlook from May 29 through June 2 for the continental United States and Alaska.

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