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entomology

CANOLA FLEA BEETLE EMERGING EARLY DUE TO WARM SPRING

The unusually warm spring has accelerated the emergence and development of insect pests, including canola flea beetles. These pests were recently spotted near Cooperstown on garden radishes (source: Jeff Stachler, CREC).

Both crucifer and striped flea beetles are emerging ahead of schedule. They typically begin feeding on volunteer canola and weeds such as wild mustard before moving into spring-planted canola fields. Depending on temperatures, it may take up to three weeks for adult beetles to leave their overwintering sites. Generally, striped flea beetles appear before crucifer flea beetles.

Weather plays a key role in their behavior. Warm, dry, and calm conditions promote widespread beetle activity and feeding throughout fields while slowing the growth of canola. Conversely, cool, wet, and windy conditions cause beetles to move more slowly into fields, concentrating their feeding near field edges.



Crucifer flea beetle, *Phyllotreta cruciferae* on left and striped flea beetle, *P. striolata* on right (Patrick Beauzay, NDSU)

Scouting and Monitoring Recommendations

It's essential to scout canola fields from the seedling stage through the 4- to 6-leaf stage during May and June. This helps assess whether insecticide seed treatments are effectively protecting the crop against flea beetles. Neonicotinoid and diamide insecticide seed treatment resistance has been identified in the striped flea beetle in North Dakota (Knodel et al., unpublished research).

Scouting and Monitoring Recommendations (continued)

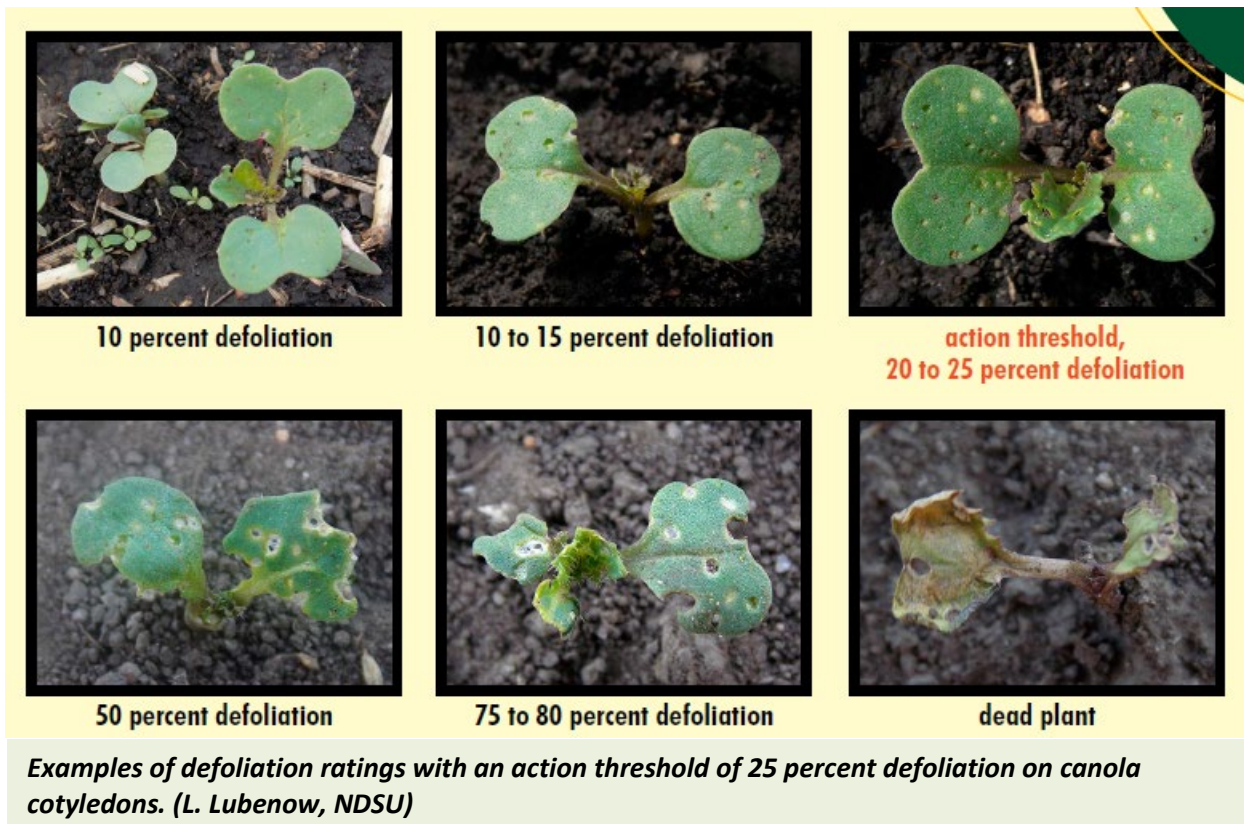
- ✓ Use yellow sticky traps to monitor flea beetle emergence and population trends. Note: traps indicate presence but do not determine threshold levels or control needs.
- ✓ Walk a W-pattern through each field and inspect five different sites.
- ✓ At each site, assess defoliation on 10 plants (a total of 50 plants per field).
- ✓ Calculate the average defoliation level.

Thresholds and Action Steps

Daily field checks are recommended. **For foliar insecticides, the economic threshold is 20–25% defoliation of cotyledons and/or the first true leaves, with active beetle feeding observed.** Be especially vigilant in hot, dry weather, when beetle populations can surge. Feeding typically slows during cool, rainy periods.

Treatment Options


If flea beetle populations reach or exceed the action threshold, consider a foliar-applied insecticide. The pyrethroid group of insecticides is commonly used. No reports of foliar insecticide resistance have been observed in either crucifer or striped flea beetles (Knodel et al. unpublished research). Use the high label rate of an insecticide to mitigate the risks of insecticide resistance. Timely application is critical to prevent significant crop damage. Refer to the current [North Dakota Field Crop Insect Management Guide \(E1143\)](#) for a list of registered insecticides for flea beetles in canola in North Dakota. Always read and follow all pesticide label instructions.



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plant pathology

PHYTOPHTHORA ROOT ROT MANAGEMENT BY RESISTANCE

As we kick off the soybean planting season across North Dakota, recent moisture across the state has created favorable conditions for oomycete pathogens, such as *Phytophthora sojae*, the pathogen responsible for Phytophthora Root and Stem Rot (PRSR, Figs. 1 and 2). With a forecasted warm May, it is critical to implement proactive management strategies to protect your soybean crop from this full-season disease. Selecting resistant soybean varieties is a cornerstone of PRSR management, and understanding the role of resistance genes and field tolerance can significantly reduce yield losses.



Figure 1. Early-season damping off of soybean plants due to *P. sojae*.



Figure 2. Plant death due to *P. sojae* with characteristic chocolate brown colored lesion on the main stem creeping upward from the soil.

Phytophthora sojae is a soilborne oomycete, often mistaken for a fungus, that thrives in warm, wet conditions, making it a significant threat to soybeans in North Dakota. The pathogen produces long-lived oospores that can survive in soil for years, germinating to release zoospores when triggered by saturated soils. These motile zoospores infect soybean roots and stems, causing characteristic symptoms like damping-off in seedlings, root rot, and dark brown to black stem lesions in older plants. Infection is favored by soil temperatures above 70°F and poorly drained soils, which is why recent moisture and forecasted warm weather could heighten the risk of disease development (Fig. 3).

Rps Genes for Complete Resistance

Incorporating soybean varieties with Rps (Resistance to *Phytophthora sojae*) genes is one of the most effective strategies for managing PRSR. These genes confer complete resistance by preventing the pathogen from successfully infecting the

plant when specific races of *P. sojae* are present. Common Rps genes like *Rps1c*, *Rps1k*, and *Rps3a* are used across North Dakota, but their effectiveness depends on matching the gene to the prevalent pathogen races in your field. Regular scouting and testing can help identify the *P. sojae* races present, allowing you to select varieties with the appropriate Rps genes. By deploying these resistant varieties, you can significantly reduce the risk of early-season infections, especially in wet, poorly drained soils.

Field Tolerance for Partial Resistance

In addition to Rps genes, selecting soybean varieties with partial resistance, also known as field tolerance, is crucial for managing PRSR across diverse field conditions. Partial resistance does not completely prevent infections but reduces the severity of disease symptoms and yield losses by limiting the pathogen's ability to spread within the plant. However, partial resistance is only activated within the plant after the first true leaves have emerged. This type of resistance is particularly valuable in fields with mixed or unknown *P. sojae* races or when Rps genes are overcome by new pathogen strains. Varieties with high levels of partial resistance maintain better root health and plant vigor, even under disease pressure, making them a reliable choice for long-term PRSR management in North Dakota's variable climates.

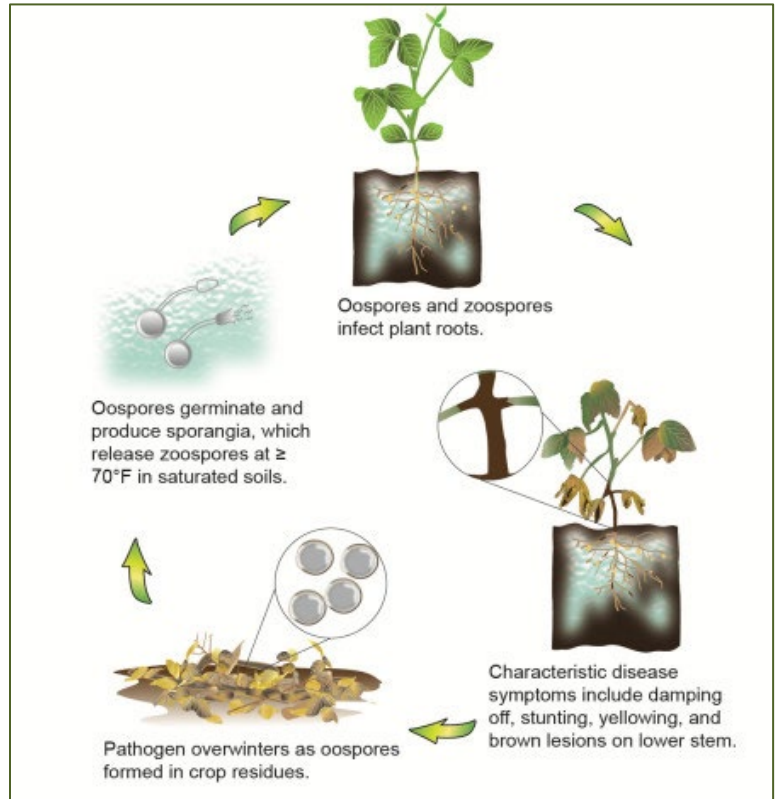


Figure 3. Disease cycle of *Phytophthora* Root and Stem Rot. (Credit: Crop Protection Network)



Figure 4. Partial resistance (field tolerance) can vary between varieties. The variety on the right has a higher level of partial resistance than the variety on the left. Both varieties contained *Rps1k*, which was overcome. (Credit: Martin Chilvers)

Additional Management Strategies

Beyond resistant varieties, integrated management practices can further suppress PRSR. Seed treatments containing effective active ingredients provide early-season protection against *P. sojae* infections, particularly when planting into warm, wet soils. Improving soil drainage through tiling or avoiding planting in low-lying areas reduces the waterlogged conditions that favor the pathogen. Crop rotation with non-host crops like corn or small grains helps break the disease cycle by reducing *P. sojae* oospore populations in the soil. Unfortunately, there are no foliar fungicides with efficacy against PRSR. Regular scouting and maintaining field records can also guide future management decisions. By combining these strategies with resistant varieties, you can build a robust defense against PRSR.

[Wade Webster](#)

Extension Plant Pathology, Soybeans



WATERHEMP CONTROL IN SUGARBEET

Congratulations to sugarbeet growers that applied soil residual herbicides for waterhemp control before the rainfall events on April 28 and May 1. Most areas received rainfall totals sufficient to activate ethofumesate herbicide.

What if you didn't get your fields planted before the rains? What are your waterhemp control options, especially as the weather calendar suggests dry conditions for the next 7 to 10 days.

Waterhemp will be emerging soon. It is true, I have not seen waterhemp or received calls from growers, retailers, or consultants reporting waterhemp. However, waterhemp emergence is close and you will need a soil residual herbicide applied at planting. I see three options.

First, use Dual Magnum alone at 16 fl oz per acre. I don't worry about Dual Magnum injury in May so the 1 pint rate will be fine, especially on soils with greater than 3% OM.

Second, use ethofumesate at 2 to 3 pt per acre mixed with Dual Magnum at 8 to 12 fl oz per acre. The Dual Magnum requires less rainfall for activation and the ethofumesate will provide longer residual control once activated.

Finally, I recommend incorporating ethofumesate with tillage if you plan to use ethofumesate alone. I suggest rates 4 pint per acre or greater if you intend to incorporate. Unfortunately, incorporating ethofumesate means cereals as nurse crops likely will not survive. You will need to pick either nurse crops or incorporating ethofumesate for waterhemp control but you probably cannot have both.

REVISED SPIN-AID SPECIAL LOCAL NEEDS LABEL FOR SUGARBEET IN MINNESOTA AND NORTH DAKOTA

North Dakota and Minnesota Department of Agriculture has approved a revised 24c SLN Label for Spin-Aid. The updated local needs label provides the following:

- Increased Spin-Aid use rates, especially on cotyledon to 4-lf sugarbeet.
- Recommendations for 2- and 3-times Spin-Aid application for kochia control.
- Recommendations for Spin-Aid mixtures with Stinger HL for common ragweed control.
- Aerial application.

TOLVERA NOW HAS NINE-MONTH CROP ROTATION INTERVAL TO SUGARBEET

You may have heard Dr. Kirk Howatt's presentation about Tolvera™ herbicide for broadleaf and grass weed control in spring and winter wheat, durum and barley? The product features two modes of action: tolpyralate, an active ingredient new to the cereals market and bromoxynil.

The crop rotation interval to sugarbeet was recently adjusted to nine months and is federally approved and approved by the states of North Dakota and Minnesota. Tolvera herbicide offers robust broadleaf and grass weed control without reliance on ALS or auxin modes of action. This herbicide can help with control of challenging weeds and grasses in cereals including kochia, foxtail species, barnyardgrass, and waterhemp.

[Tom Peters](#)

Extension Sugarbeet Agronomist
NDSU & U of MN



NDSU PLANT DIAGNOSTIC LAB

Do you have problematic plants that are stumping you in your fields or garden? Look no further than the NDSU Plant Diagnostic Lab (PDL)—your trusted resource for identifying plant pests and diseases for over 60 years! Serving farmers, consultants, county Extension agents, and homeowners, we provide quick, accurate, and affordable diagnoses to help keep your crops and plants thriving. If you're unsure about what you're seeing, please ask us. You don't need to have all the answers before you reach out—our lab is here to help.

Submitting a Sample: Key Guidelines


- **Choose Good Material:** Send plants or plant parts showing a range of symptoms, especially where healthy and affected tissue meet.
- **Whole Plant Preferred:** If possible, submit the entire plant wrapped in paper towels and in a secure bag. If roots are included, wrap them separately to prevent contamination of plant parts with soil.
- **Do Not Freeze:** Avoid freezing samples, as tissue can degrade when thawed. Instead, store them in a cool, dark place—like a refrigerator—until shipment.
- **Protect the Paperwork:** Fill out the sample form from our website and place it in a separate zip-lock bag to prevent water damage.
- **Send Photos:** Email clear, high-resolution images of close-up symptoms, the whole plant, and the surrounding area to ndsu.pdl@ndsu.edu.
- **Timely Submission:** Send the sample as soon as possible after collection, and early in the week to avoid weekend delays.
- **Shipping Address:** The preferred shipping method is physical courier for faster, more reliable delivery. Please mail samples to:


NDSU Plant Diagnostic Lab
1402 Albrecht Blvd., Walster Hall 306
Fargo, ND 58102

Need More Info?


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 www.ag.ndsu.edu/pdl

 Email: ndsu.pdl@ndsu.edu

 Phone: (701) 231-7854


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- Provide science-based recommendations
- Work with extension colleagues to ensure proper recommendations


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- Manage the problem
- Save time, effort, and expense
- Learn about the pests and diseases affecting your plants
- Target management to protect environmental health



Plant Diagnostic Lab 



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Plant Diagnostician



around the state

AROUND THE STATE

NORTHEAST ND

The planting season is now underway across the region, with much of the activity concentrated in the Red River Valley. Farmers are currently seeding sugarbeets, small grains, field peas, and some corn. Last week's rains largely bypassed the area, allowing fieldwork to proceed with activities such as tillage, fertilizer application, and planting moving ahead at a steady pace.

However, dry conditions paired with strong winds have created challenges, including dust clouds and soil erosion. In some cases, high winds have even forced farmers to pause planting as seeds were blown back into the seeder. Soil moisture levels vary widely across the region, ranging from very dry to saturated low spots.

Early weed pressure is beginning to show, with kochia and lambsquarters emerging in several fields. Volunteer canola has also begun to sprout, and flea beetle activity has already been observed in Ramsey County.



Spring wheat planting in Walsh County. Photo: Charlene Mc Gregor, Walsh County



Farmer spreading fertilizer in his field. Photo: Charlene Mc Gregor, Walsh County



A) Lambsquarters and B) Kochia seedlings emerging in wheat residue. Photo: Anitha Chirumamilla, Langdon Research Extension Center

[Anitha Chirumamilla](#)

Extension Cropping Systems Specialist
Langdon Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

Planting has begun across the whole South-Central and Southeast (a diagonal from Sheridan to Richland and Traill to Emmons Counties) areas of North Dakota with some crops having emerged across parts of this region.

Of the 27 NDAWN stations I have chosen this season for this region, the average maximum daily air temperature from April 21, 2025 to May 5, 2025 ranged from 61 degrees Fahrenheit near Finley and Streeter to 67 degrees Fahrenheit near Sonora with an average for the region for this period of 63.4 degrees Fahrenheit. Based upon historic weather near Cooperstown, the average daily high temperature for this time period was 2 degrees Fahrenheit above normal, so my guess is that was similar across the region. The average daily minimum air temperature for the above mentioned time period and the 27 NDAWN stations across the region ranged from 34 degrees Fahrenheit near Hope, Oakes, and Pickardville to 39 degrees Fahrenheit near Fingal, Hurdsfield, Livona, and Wirsch with the daily average for the region and time period of 36.8 degrees Fahrenheit. The historical average daily minimum air temperature for this time period near Cooperstown was 1.4 degrees Fahrenheit below normal. The coldest low temperature across the region for this time period was 17 degrees Fahrenheit on April 29th near Skogmo!

Rainfall for these stations across the region for the above mentioned time period ranged from 0.4 inch near Pickardville to 2.3 inches near Galesburg with an average for the region and period of 1.5 inches! Based upon historical average daily rainfall for this period, Cooperstown received 0.7 inch of rain above normal, which should be similar to many areas, but not all as some received way less than this normal in Sheridan County and likely way more than normal in Galesburg. At this point in time Sheridan is the driest county in the region followed by part of Burleigh County and a small part of northwest Wells County. As of May 5th, the four-inch soil moisture at Skogmo was only 8.1% and the 39-inch soil

moisture depth was only 11.7%, indicating very dry soils throughout the soil profile. Within this region and the stations reported, as of May 5th, Gardner had the greatest 4-inch and 39-inch soil moisture at 41.8% and 48.2%, respectively.

The average daily 4-inch soil temperature May 5th ranged from 51 degrees Fahrenheit near Galesburg to 65 degrees Fahrenheit near Courtney and Livona with an average for the region from these stations of 58 degrees Fahrenheit. With these current soil temperatures and the current eight day forecast corn should be planted now and should emerge quite uniformly if planted later this week.

As of May 5th, at least 50% of the hard red spring wheat has been planted in the region with Sheridan, Cass, Emmons, and Sargent Counties over 90% completed with planting. These counties have anywhere from 10 to 100% of the hard red spring wheat emerged with most looking good to excellent at the moment.

As of May 5th, only Cass, Emmons, Logan, McIntosh, Ransom, and Sargent Counties had greater than 20% of the corn acres planted with little to no corn emerged as of May 5th. That will change quickly with the warmer forecast.

Most dry peas in the region have been planted if soil conditions were dry enough.

Cass, Emmons, Richland, and Sargent Counties have the most soybeans planted as of May 5th at about an average of 40% for these counties. Few soybeans have been planted in most other counties of the region.

Canola is being planted now as well with the southern region nearly all planted. For those growing canola in the region, please scout for striped and crucifer flea beetles as populations appear to be very high already in most of this region. Most of the radishes in our garden in Cooperstown have been destroyed by both flea beetle species since I did not control the flea beetles.

Please apply the appropriate burndown herbicides in no-tillage fields as kochia seems to be quite prevalent this year.

With the presence of PPO-, glyphosate-, ALS-, and dicamba-resistant kochia in pockets scattered throughout the region herbicide choices are critical for all crops, but especially soybean. Please apply preemergence herbicides preferably to all crops for best weed control, but this is difficult in small grains and corn due to low prices for these crops and a few more effective postemergence herbicide available. Common lambsquarters seems to be fairly prevalent this spring as well in the region. All of the earliest emerging weed species have a high percentage of plants emerged already and many of the next wave of weeds are emerging as well including waterhemp in the Fargo area.

Please be safe while completing all farm work this week since most everyone will be out planting by the time you read this article.



Pictured on the left shows how dense kochia populations are this spring in some fields. Pictured on the right is common lambsquarters at about one inch in height.

[Jeff Stachler](#)

NDSU Extension Cropping Systems Specialist
Carrington Research Extension Center

SOUTHWEST ND

With an early snowmelt and quick soil dry-up, we were off to an early start to the season in southwest North Dakota this year. There were reports of fertilizer being applied as early as mid-March and spring wheat planted as early as late March in some counties. Despite persistent drought conditions, there was just enough moisture to get small grain crops—like spring wheat, barley, and oats—and even some corn in the ground.

With that, small grain emergence is already being observed in some fields, and farmers are moving on to planting other crops like canola, soybeans, and more corn. With an early start to the season, there are a few considerations to keep in mind to ensure good crop performance.



Figure 1. Spring wheat emerging in Stark County, ND.

The Importance of Early Season Stand Counts

With volatile markets, rising input costs, and unpredictable weather, every penny counts. Taking action early to assess crop health is an important step toward securing strong yields and profitability. Doing a stand count early in the season, once the crop has emerged, is simple and valuable. It only takes a little extra effort while you're already out scouting for weeds. This quick check helps verify whether seedbed prep and planting went as planned and whether the desired plant population has been achieved. For North Dakota, the minimum acceptable stand for small grains typically ranges between 8 to 14 plants per square foot.



Figure 2. Early small grain stand counts are crucial for determining crop health and yield potential.

How to Do a Small Grain Stand Count:

1. Count the number of plants in one foot of row at least five different locations across the field.
2. Take the average and use the table below to convert your count to plants per acre based on row width.

Table 1. Plant population per row foot based on seeding rate and row spacing

Row width	800,000	900,000	1.0 M	1.1 M	1.2 M	1.3 M	1.4 M	1.5 M
6 inches	9.2	10.3	11.5	12.6	13.8	14.9	16.1	17.2
7 inches	10.7	12.1	13.4	14.7	16.1	17.4	18.7	20.1
10 inches	15.3	17.2	19.1	21.0	23.0	24.9	26.8	28.7
12 inches	18.4	20.7	23.0	25.3	27.5	29.8	32.1	34.4

Beware of Low Germination Rates in Soybean Seed Lots

As the planting season progresses to crops like soybeans, growers should keep a close eye on their seed tags and double-check germination rates. Sub-optimal weather at harvest in many soybean seed production areas in 2024 can affected seed quality going into the 2025 season.

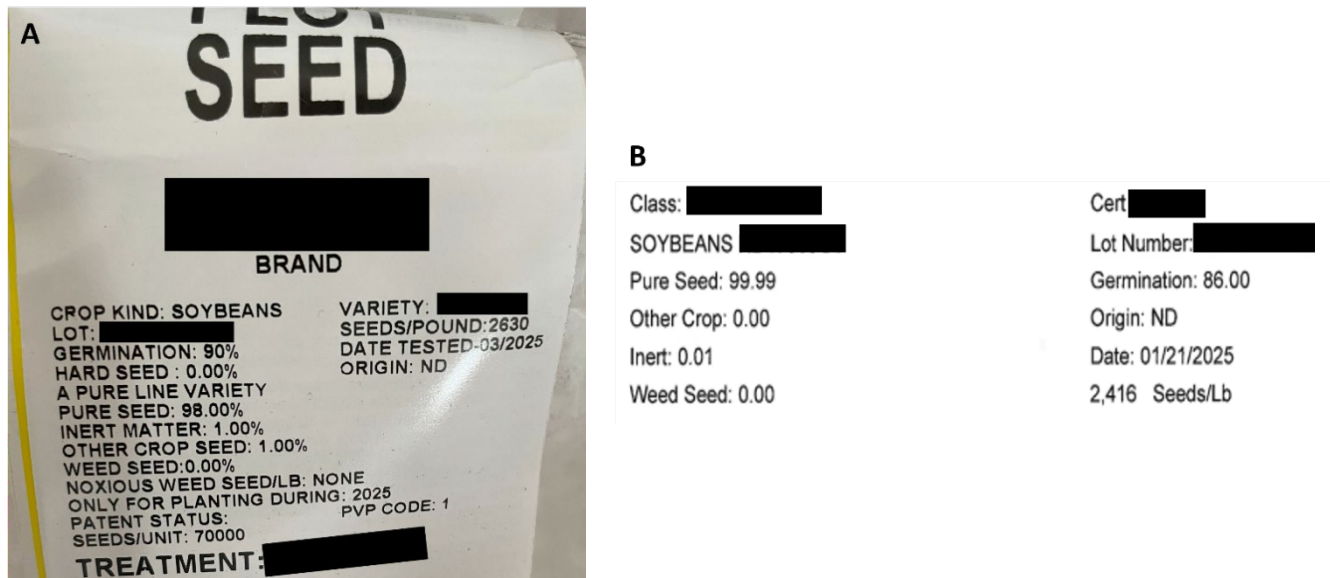


Figure 3. Soybean seed tag showing germination rate, date tested, and other key information (seed tag A shows 90% germination versus seed tag B shows 86% germination).

Here are a few recommendations for soybean growers:

- **Check the germination rate** on your seed tag before planting and adjust your seeding rate accordingly.

To adjust, divide your target plant population per acre by the germination rate in decimal form.
Example: If you're aiming for 125,000 plants/acre and your seed tag shows 85% germination (0.85), you'll need to plant approximately 147,000 seeds/acre.
- **Consider running a seed vigor test** to help decide which seed lots to plant first, especially for early planting conditions.
- **Seed treatment with fungicide** is always a good idea to protect against early-season diseases and reduce stand losses.

With planting season moving fast, it's easy to feel the pressure to rush. But taking the time to get things right from the start helps reduce variability across the field. While some yield can be recovered later in the season, few decisions have as much impact as those made at planting. A few extra minutes now can pay off more than anything you apply later.

[Victor Gomes](#)

Extension Cropping Systems Specialist
NDSU Dickinson Research Extension Center



WEATHER FORECAST

The May 8 to May 14, 2025 Weather Summary and Outlook

Typical of our Northern Plains climate, rain rarely falls evenly. In the past 30 days, south central North Dakota through the central Red River Valley has recorded above average rain. The same can be said of the far northwestern corner of the state. Sandwiched in between from Bowman County to Pembina County has been a strip of below average rain. In some areas, well below average rain. There is also another area of below average rain in far southeastern North Dakota (Figure 1). Dry looks to be dominating the region over the course of the next week with only spotty rain expected. This should allow for continued rapid planting in the next several days. There are indications of a storm in the second half of next week and that would be the most likely timeframe for precipitation in most areas.

Percent of Normal Precipitation - Past 30 Days (%)

May 06 2025

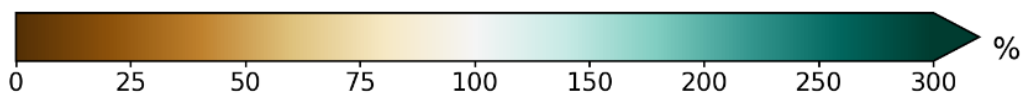
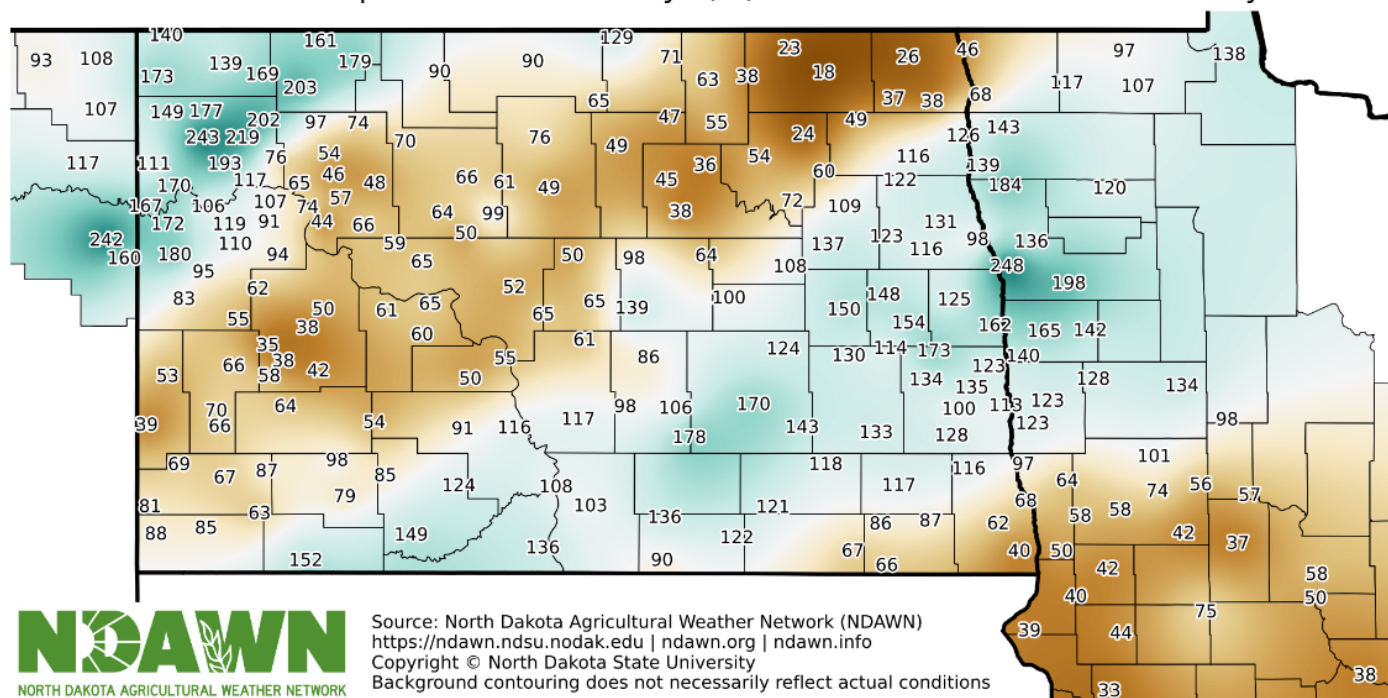


Figure 1. Percent of Normal precipitation for the 30-day period ending on May 6, 2025.

As an example of how dry some areas of the state are getting, parts of southwestern North Dakota have gone nearly a year without a daily 0.50 inch rainfall (Figure 2). Not shown, but some NDAWN (North Dakota Agricultural Weather Network) stations have gone nearly two years without a daily 1 inch rainfall.

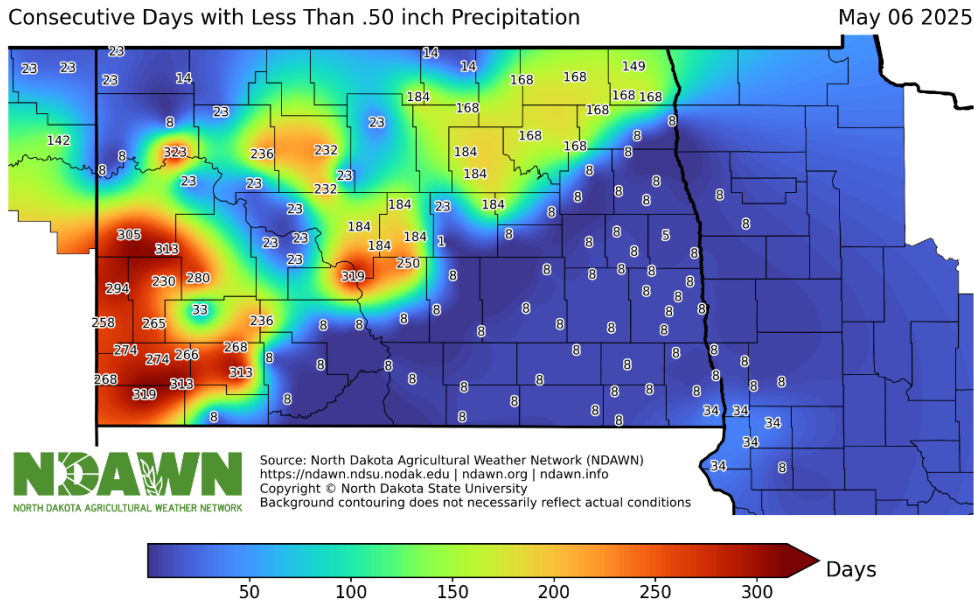


Figure 2. Consecutive Days Without a Daily One-Half Inch or Greater Rainfall (or melted snow).

April finished very close to the average for temperatures (Figure 3). It may not of felt that way, but it was a month as average as we can expect in our climate. April started cold and snowy, but finished with above average temperatures that balance things out. It was the second April in a row with at least average, or slightly above average temperatures. Overall, April has trended much colder this century, meaning the past two years have deviated from that trend of colder Aprils.

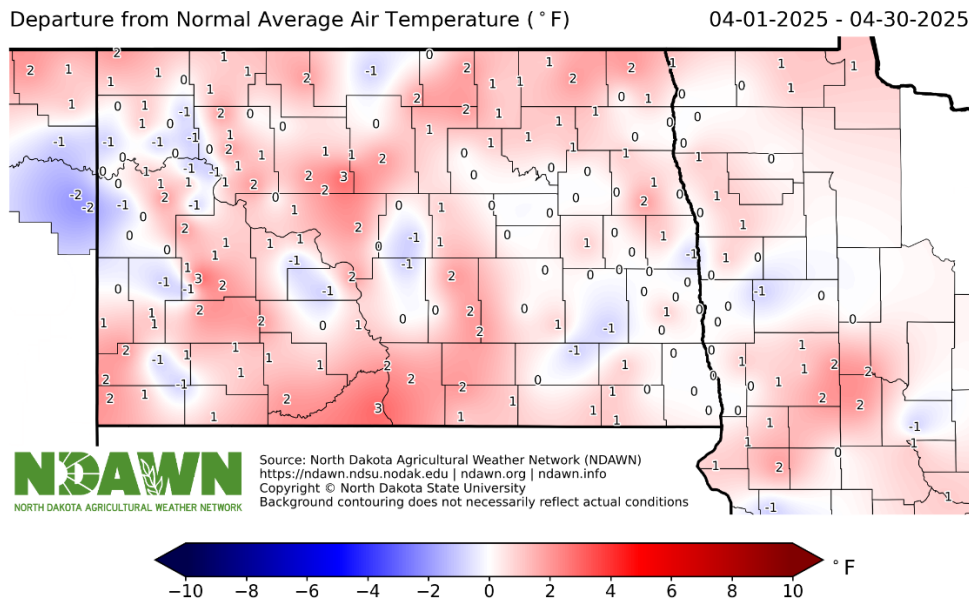


Figure 3. Departure from Average Air Temperature at NDAWN stations during April 2025

Figures 4 and 5 below are forecasted growing degree Days (GDDs) base 32° (wheat and small grains) and 50° (corn and soybeans) for this forecast period. This period is expected to produce the same number of GDDs that would normally be expected in June. It would be difficult to find another period this time of year with such a high number of growing degree days.

Growing Degree Days (Base 32) Forecast

May 08 - May 14 2025

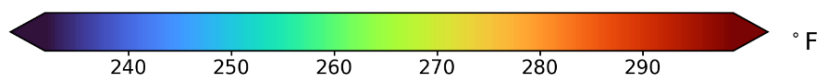
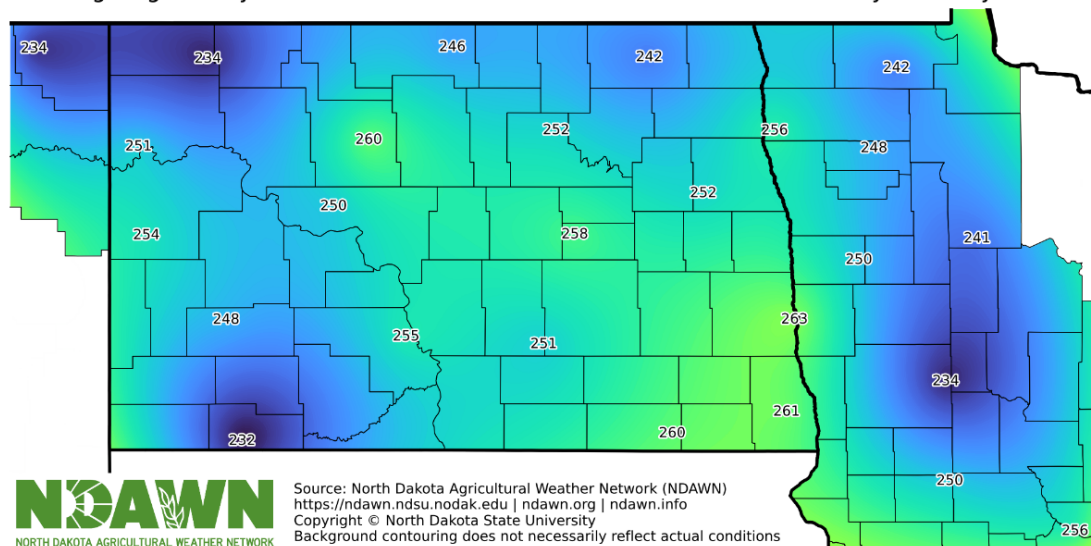


Figure 4. Estimated growing degree days base 32° for the period of May 8 to May 14, 2025.

Growing Degree Days (Base 50) Forecast

May 08 - May 14 2025

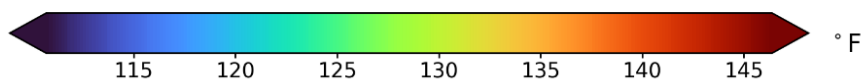
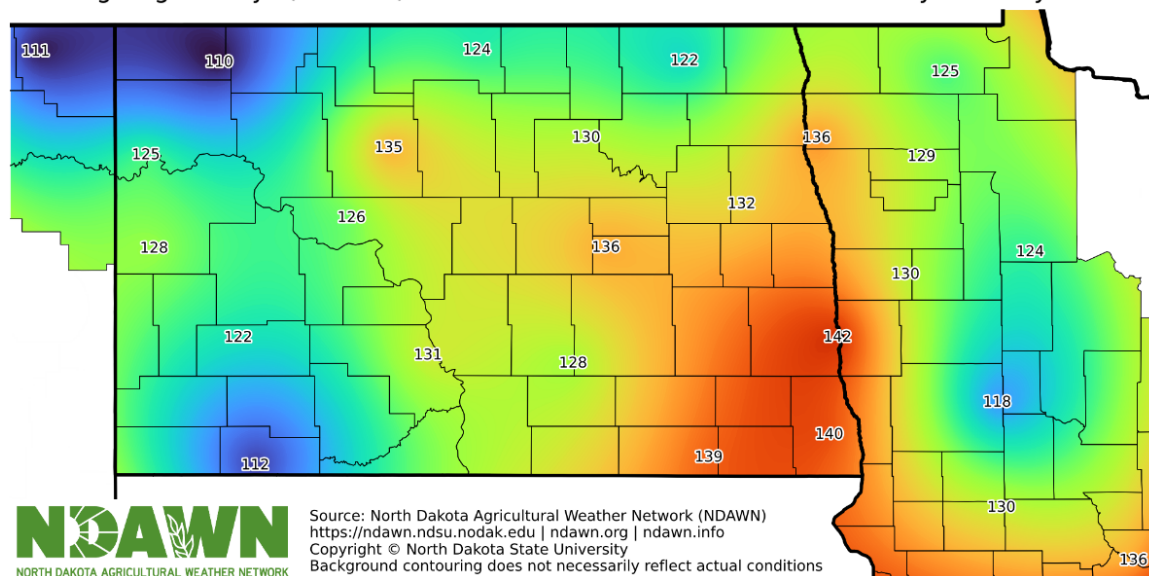


Figure 5. Estimated growing degree days base 50° for the period of May 8 to May 14, 2025.

The four-inch bare soil temperatures have now gotten close to or exceeded 50° in much of the region (Figure 6). Afternoon soil temperatures have been consistently above 50° or even 60° with morning readings (Figure 5) or daily averages closer to 50°. With temperatures near or above average during the next week, soil temperatures should continue to slowly warm.

Soil Temperature 4 Inch Bare Soil (° F)

May 07 2025 09:16 AM

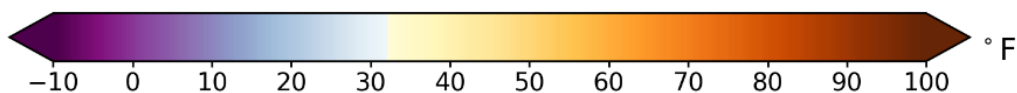
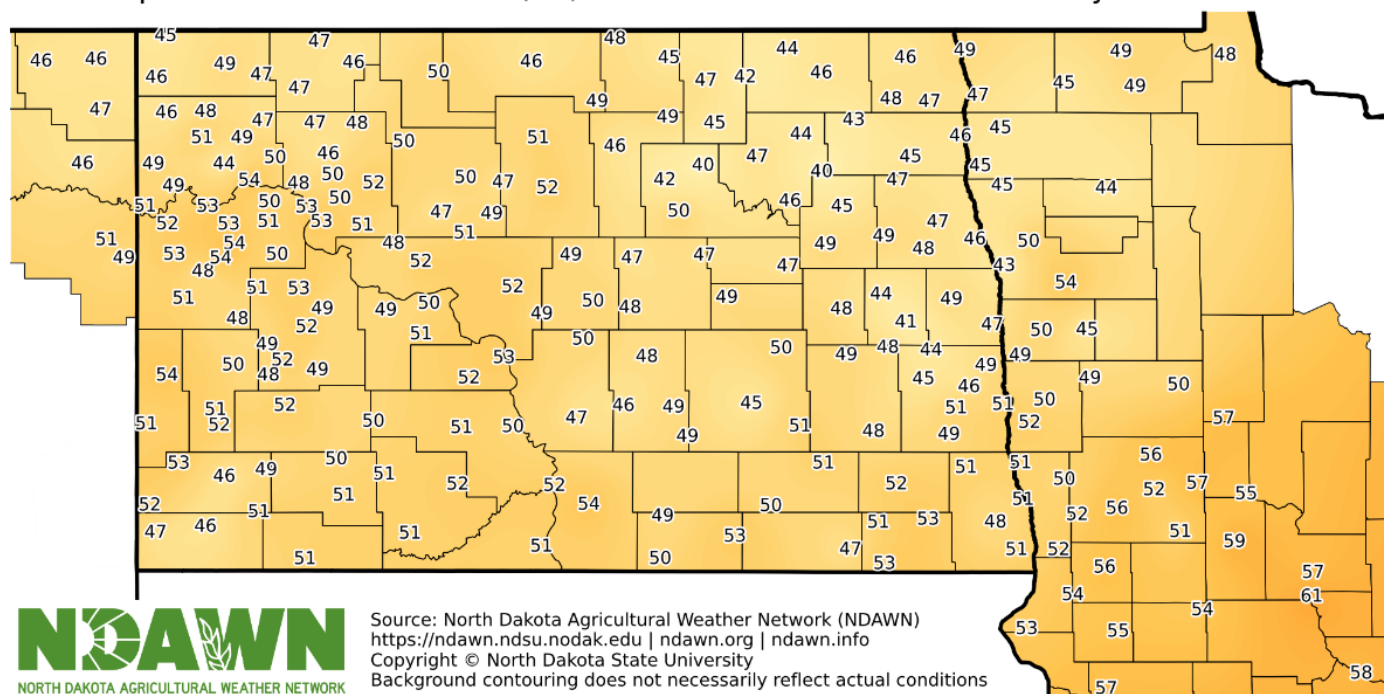


Figure 6. Four-inch bare soil temperatures at NDAWN stations at 9:15 AM on May 7, 2025.

If there are any requests for what you would like in this report during the 2025 growing season, please reach out to me.

[Daryl Ritchison](#)

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