North Dakota State University
CROP & PEST REPORT

NDSU EXTENSION

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entomology

ALFALFA INSECT PEST SURVEY

If you didn't have time to complete this survey the first time, here's your chance to take it! We need more farmers, agronomists, crop consultants and pesticide applicators from North Dakota or Midwest states involved in alfalfa production to take this survey. The survey results will help guide future research and extension recommendations and assess pest pressures from alfalfa insects.

Reports from North Dakota and neighboring Midwestern states suggest that **alfalfa weevil larvae may be feeding longer than expected and are not always well controlled by pyrethroid insecticides**. Similar issues have already been confirmed in Montana and parts of the western U.S., where populations of the alfalfa weevil have developed resistance to pyrethroids.

This Midwest Alfalfa Insect Regional Survey is coordinated by the University of Minnesota Extension. To participate, please click the survey link below or scan the QR code.

https://z.umn.edu/alfalfapestsurvey

NDSU Extension Entomology is also seeking alfalfa fields with high alfalfa weevil populations for the 2026 season. We will come out to the fields to collect live alfalfa weevil larvae for testing for pyrethroid resistance. If interested, please email janet.knodel@ndsu.edu and patrick.beauzay@ndsu.edu with "*Alfalfa weevil*" in the Subject line.

Thank you for your time and help.

Janet J. Knodel
Extension Entomologist

plant pathology

DEMYSTIFYING THE BIOLOGY OF BIOLOGICAL CONTROL

Biological control products, often called “biologicals,” are becoming increasingly common across agriculture, especially with plant protection and disease control. Over the past week, I have had three separate conversations about these types of products and how they should be considered distinctly different from our traditional chemical fungicide products. Biological products are a broad category, and not all products work the same way. Some biologicals contain living microorganisms, such as bacteria or fungi, intended to colonize the seed, roots, leaves, or other plant parts. Common examples include bacteria such as Bacillus and Pseudomonas, as well as fungi such as Trichoderma. Other products may contain non-living, naturally derived compounds, such as plant extracts, microbial metabolites, enzymes, organic acids, and other compounds produced by living organisms. This distinction is important because a living biological product must survive and become active after application, while a non-living biological product may behave more like a traditional fungicide, depending on the active ingredient.

When we think about biological products, especially those containing living microbes, it is helpful to remember that we are not simply applying a chemically active ingredient. We are applying an organism that must survive in a highly competitive and often hostile environment. Before moving on to the next paragraph, I want you to think about the question I am going to ask next. What percent of life in the soil do you think makes up all plant pathogens? Remember when thinking pathogens, we are talking about a large list including Rhizoctonia, Fusariums, Pythiums, Phytophthoras, Diaporthes, Sclerotinia, Clonostachys, Colletotrichum, and many more organisms with hard-to-pronounce Latin names that can cause issues in many of our crops. Now, thinking back to my question on the percentage of all life in the soil. Remember, we are also thinking about all the insects, fungi, bacteria, nematodes, and viruses. Final chance, answer the question in your head before moving on to the next paragraph.

The time has finally come for the answer, and as I am writing this, there is a drumroll going on in my head. The answer is estimated to be less than one percent of all life in the soil is a plant pathogen. Less than 1%! So, what is the other 99%, you might ask? These could include some of our rhizobia that help soybeans fix nitrogen, our saprotrophic fungi that help break down last year’s corn stalks, or, most likely, microbes that have absolutely no direct effect on crop growth. However, each of these microbes still needs to feed, compete for resources, and survive to produce the next generation. Now, as we redirect our attention back to the use of biological control products, it is important to think of these new biological products as an intruder, or put in more friendly terms, the new kid on the block. Initially, these biological agents will struggle to survive. Many of the other microbes in the soil will be competing for the same resources, whether that is food, water, or space. Even though these biological products we placed into our field are known to have protective or beneficial characteristics in a lab or greenhouse, under this new colosseum, which is our field soils, these biologicals will be competing with native microbes, which have been living in this soil for generations and have well-established ecological niches. This will be incredibly difficult for these biologicals to establish. However, it is not impossible for these products to still make it and be successful.

For biological products to succeed, they need to be placed in an environment where they can survive, establish, and become active. For most living biologicals, this often means having adequate moisture, favorable temperatures,

available nutrients, and placement near the target area, such as the seed, root zone, soil surface, or leaf surface. Now this will change for each product depending on its specific biology. For example, *Coniothyrium minitans*, the active agent in the product Contans, has optimal conditions between 60°F and 65°F, while Trichoderma harzianum, a commonly used beneficial fungus, grows best between 75°F and 85°F. However, just because these are the optimal temperatures for each species, it does not mean they will not survive. If they are placed in the soil at 50°F, they will simply be less competitive against the other native soil microbes. Because of this, biologicals should not be expected to work equally well in every field, every year, or under every environmental condition. The best chance for success occurs when the right biological product is matched with the right crop, target pest, application timing, placement, and field environment.

Wade Webster
Extension Plant Pathology, Soybeans

PLANTING CONDITIONS UPDATE

Across much of North Dakota, soils are still just shy of ideal planting conditions. As discussed in *In the Pod* with Jeff Stachler, soil temperatures around the Carrington area have not consistently reached 50°F yet (In the Pod: Soybean Updates | Spring Stalled: Soybeans on Hold). Statewide conditions are close, but not quite there. Some fertilizer applications have begun, but most operations are waiting for warmer, drier soils. Check your soil temperature at NDAWN | Soil.

That said, conditions are expected to improve soon, and increased field activity is likely in the coming week. As planting begins, remember to **stay alert and share the road safely** with farm equipment. To know more about good road practices, check this article: Share the road during spring planting season — Extension and Ag Research News.

Early Planting Considerations

Soybean seeds begin water uptake (imbibition) within hours after planting, with most uptake completed in the first 24–30 hours. During this critical window, soil temperatures at seed depth should remain above ~45°F. Cold rain or low temperatures immediately after planting can cause **imbibitional chilling**, leading to uneven emergence or seedling injury.

While soybeans tolerate cool conditions better than corn, very cold, wet soils can still damage cotyledons and reduce stand establishment. This is why post-planting conditions are just as important as soil temperature at planting.
Early planting also increases the risk of frost. Soybean cotyledons can tolerate temperatures below freezing better than corn, but injury becomes more likely as plants develop beyond emergence. To assess your local late-frost risk, consult the Freeze Date Tool.

Seed Treatments and Stand Protection

If planting early, seed treatments become an important management tool. As discussed by Wade Webster in *In the Pod* (In the Pod: Soybean Updates | Seed Treatments & Seedling Survival), treatments can protect seedlings for approximately two weeks after planting.

Not all seed treatments are the same. Products targeting **true fungi** differ from those needed for **water molds**. Therefore, it is important to understand what active ingredients are included in your seed treatment. If fields have a history of *Pythium* or *Phytophthora*, an additional product may be necessary to ensure adequate protection. For more details, see the 2026 Plant Disease Guide

Seeding Rate and Economics

Early planting can increase yield potential, but only if adequate plant stands are achieved. Cold, wet conditions increase the risk of seedling loss, so consider increasing seeding rates by about 10% when planting into marginal conditions. With tighter farm margins and rising input costs, including seed, fertilizer, and fuel, careful decision-making is especially important this season. Prioritize conditions that favor strong emergence to protect your investment.
Early soybean planting should be approached as a **risk-managed system**, not a race against the calendar. Success depends on balancing opportunity with risk; avoiding cold, wet conditions immediately after planting and ensuring proper seed protection.

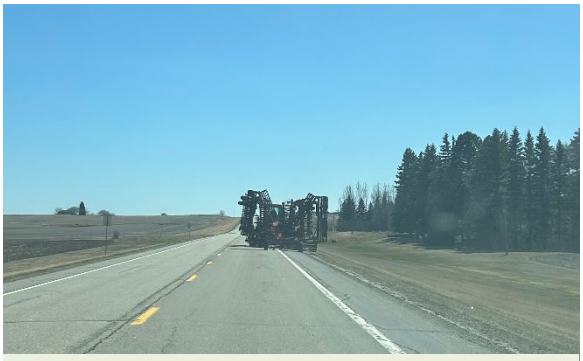
Ana Carcedo
Broadleaf Crop Agronomist

around the state

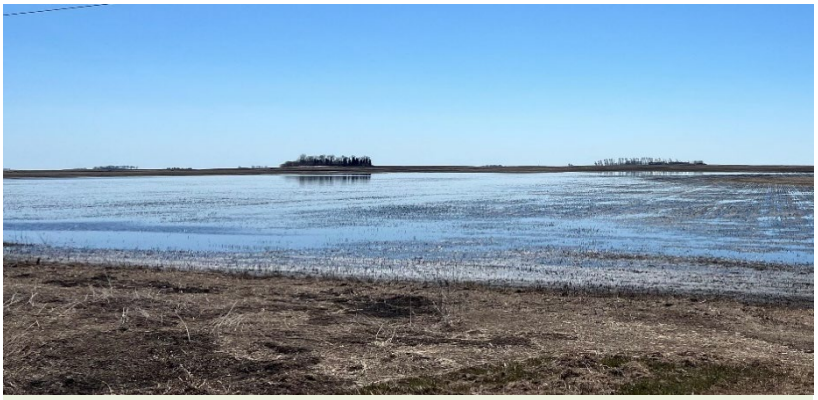
AROUND THE STATE

NORTHEAST ND

The majority of farmers are still waiting to begin fieldwork due to wet, cold soil conditions across much of the region. However, recent high winds should help dry out low-lying and saturated areas. Planting has begun in the eastern portions of Pembina, Walsh and Grand Forks counties, with small grains and sugarbeets currently being seeded. Soil temperatures range from 40 to 42°F, and overall soil moisture levels have been favorable so far this season. Field activity is steadily increasing, with more farm equipment on the roads and in the fields as producers begin harrowing, applying fertilizer, and planting.



Farmer moving equipment. Photo: Anitha Chirumamilla, LREC



Wet field in Cavalier County. Photo: Anitha Chirumamilla, LREC

Planting in Pembina County. Photo: Alissa Sharp, Extension Agent, Pembina County

Anitha Chirumamilla
Extension Cropping Systems Specialist
Langdon Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

The South-Central and Southeast Regions of ND include Emmons County in the southwest corner, Sheridan County in the northwest corner, and then all the way to the Red River with Traill County in the northeast part of the region and Richland County on the southeast border of the region.

Soils are drying out, and crop planting has been happening across most of the region in the past two weeks.

Approximately 55% of the small grains have been planted in the region, with LaMoure and Sargent Counties reporting all small grain acreage planted. Other areas with 55 to 70% of small grains planted include Sheridan, Griggs, and Burleigh Counties, while the remaining counties in the region plant less than 20% of their small grain crop acreage. The earliest-planted hard red spring wheat in Griggs and Richland Counties has begun to emerge. Emerged wheat is looking great at the moment.

Sugarbeets are being planted in the Red River Valley, with Richland County likely having the most planted acreage at around 80% of the crop, and some of the earliest-planted fields are starting to emerge.

Little corn acreage has been planted across the region, with Burleigh and Eddy Counties reporting no corn planted yet, while LaMoure and Richland Counties reported 10% of their corn acreage planted. Only about 5% of the corn acreage has been planted in the entire region so far! **Figure 1** shows a planter in a Foster County field. The current percentage of planted corn acres has occurred across most of the southern part of the region, at about 20% of the total corn acreage.

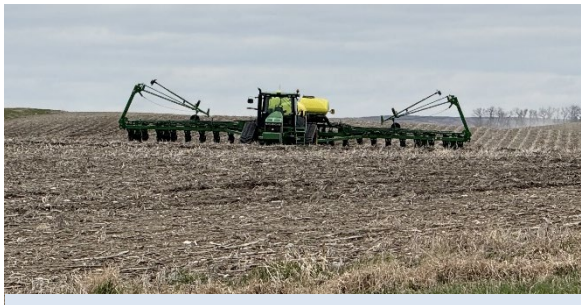


Figure 1. Planting corn in Foster County on May 5, 2026.

Few soybean acres have been planted in the region so far, with Eddy County reporting no soybeans planted and Emmons County

reporting 10% planted, with the average for the region at only about 4% of acreage planted. Last year at this time, Cass, Emmons, Richland, and Sargent Counties reported up to 40% of the soybean acreage planted!

About 3% of the canola has been planted so far in the region, with Sheridan County reporting the greatest percentage of acreage planted at 30%.

No other crops have been planted in the region at this time.

There are three major negative issues in the region at the moment. The first is soil surface moisture in sandy soils, where seeds are being planted into soils too dry to support germination. This is being reported mostly in small areas of Emmons, Burleigh, Sheridan, LaMoure, and Griggs Counties, except for Sheridan County, which is the driest. Both the surface and deep soil moisture are currently dry in Sheridan County. It was reported that the bottom of the post holes was dry in Sheridan County. The Tappen area is also quite dry. Based upon 47 of the NDAWN stations in the region reviewed, the Skogmo and Tappen NDAWN stations are the driest right now, with the 4-inch and 39-inch soil moisture being 8.3% and 8.6%, respectively, at these two depths for the Skogmo location and 12.6% and 6.8%, respectively, at these two depths for the Tappen location. If soils are being tilled to prepare a seedbed where soil moisture is limited, be sure to plant the field shortly after tillage is completed and make sure the seed is planted as deep as possible based upon the crop and good soil to seed contact is achieved using great press wheel pressure to preserve soil moisture for seeds to germinate.

The second major negative issue in the region is the 4-inch bare-soil temperature, which is the biggest driver of delayed corn and soybean planting. The daily average soil temperature for April for the 47 NDAWN stations ranged from 36°F at Bremen and Cooperstown to 44°F at Brampton, Ellendale, Livona, Sonora, and Stirum NDAWN stations, with an average of 41°F for the 47 NDAWN stations, which is about normal for April based upon the Cooperstown NDAWN station! Unfortunately, at 9:00 PM on May 5, 2026, the average soil temperature for the region was only 44.5°F, which is below the normal for this time of year! None of the 47 reviewed NDAWN stations reported a soil temperature above 49°Fon May 5th at 9:00 PM.

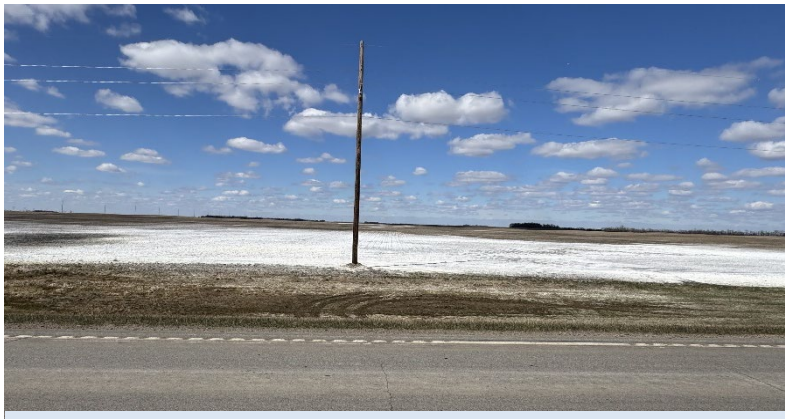


Figure 2: Large areas of Saline soils in Stutsman County.

Figure 3: Large Saline Areas in a Griggs County field.

The third major issue is the expansion of visual soil salinity. Larger areas of fields have thicker observed salts on the surface than in previous years, and more areas of fields have lower levels of visible salts on the soil surface in areas that previously have not shown visible salts on the surface. **Figure 2** shows a large area of thick salts in a Stutsman County field, and **Figure 3** shows a large area of varying degrees of visible salt content on the soil surface in a Griggs County field! Since the spring of 2021, I have never seen such a high percentage of fields with visible soil-surface salts. That being said, there has never been a season as wet, during and at the end of the season, as in 2025, and the lack of rainfall in the spring of 2026 is similar to 2021, allowing the salts to be flushed deeper into the soils. The best

recommendation is not to till these highly saline areas of the field because, as the soil surface dries, capillary action brings more salts to the surface; however, I am seeing many of these high-saline areas being tilled so far.

Over the past weekend, as soils were being tilled, soil wind erosion occurred on Sunday, as shown in **Figure 4**.

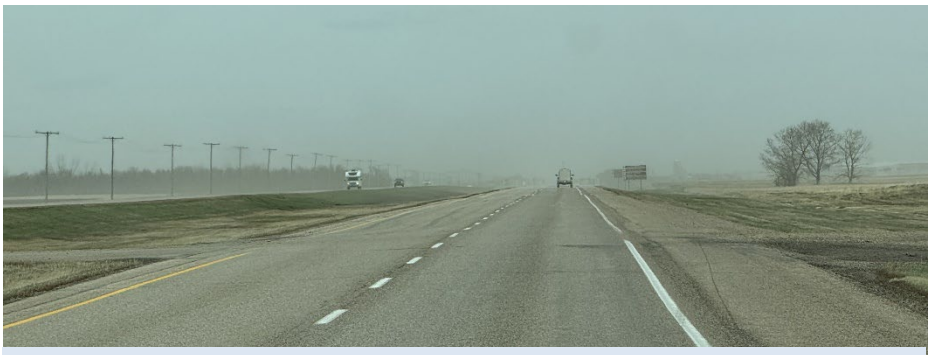


Figure 4: Soil Blowing due to tillage and high winds on Sunday May 3, 2026.

In the dryer parts of the region, it is becoming increasingly difficult to determine when to plant corn and soybeans, but especially corn. The more non-uniform the emergence of corn, the greater the corn yield loss. Soybean yields are minimally impacted by non-uniform plant emergence. In these drier regions, planting depth will be critical to maintain uniform corn emergence. If soil moisture is limited, be sure to plant corn into moist soil at a depth of 2.5 to 3 inches. Most hybrids can be planted this deep, and if there is little to no cold rainfall within 48 hours of planting, this deeper planting depth will not be a problem. Please don't plant corn shallower than 1.5 inches! Corn planted at a depth of less than 1.5 inches usually has poorer nodal root development, resulting in reduced yields. Planting corn into soils with an average daily 4-inch soil temperature around 55°F will take corn about 23 days to emerge, compared to an average daily 4-inch soil temperature around 65°F, which takes corn only about 7 days to emerge, usually allowing for a more uniform emergence and higher yields. Based on the calendar, we are approaching the time to start planting corn regardless of soil temperature, and make sure the seeds are planted into good moisture for more even plant emergence.

The average daily high temperature for April ranged from 48°F at the Ayr, Finley, and McHenry NDAWN stations to 54°F at the Livona, Streeter, and Strasburg NDAWN stations, with an average across the 47 reported stations of 51°F. Based upon historical records for Cooperstown, the average daily high temperature for April was 5°F BELOW normal! The average daily low temperature for April ranged from 26°F at the Galesburg NDAWN station to 31°F at the Sonora NDAWN station, with an average for the 47 stations of 28°F. Based upon historical records for Cooperstown, the average daily low temperature for April was only 1.6°F BELOW normal.

The total April rainfall and liquid equivalent from snow for the region ranged from 0.89 inches at Cooperstown NDAWN station to 2.24 inches at the Leonard NDAWN station, with a regional average of 1.6 inches. Based upon historical records for Cooperstown, April rainfall and liquid equivalent from snow was only 0.5 inch BELOW normal.

Please be safe during planting season, and please seek help if you are becoming depressed. Have a great rest of your week.

Jeff Stachler
Extension Cropping Systems Specialist

SOUTHWEST ND

Field activity continues throughout Southwest ND, though the lack of rainfall is a major concern for crop production in the region. No significant precipitation has been recorded in the Western half of the state over the last 7 days, and no rain is forecast for the next 10 days. The combination of dry conditions with low temperatures (dipping well into the 20's and 30's this week) will delay crop emergence and pose a significant challenge to both fertilizer and herbicide management.

In terms of herbicide management, the greatest concern is the efficacy of residual herbicides. When it comes to residual herbicides, it is advisable to consider a 7-to-10-day window for activation after the application date. Residual herbicide activation depends on moisture availability (rain or irrigation). Beyond this window, failure could occur due to:

- **Escapes**: Weeds will emerge through the inactive herbicide and survive
- **Degradation:** The inactive herbicide that's on the soil surface suffers photodegradation (degradation by light), reducing its longevity

With potential failure of residual herbicides, growers will have to be diligent and scout for weeds earlier. If residuals fail, earlier postemergence applications may be necessary.

In terms of fertilizer management, with persisting dry conditions, nitrogen losses from anhydrous ammonia applications are a major concern. To avoid nitrogen losses from anhydrous application, consider injecting the soil at least 4 inches deep, which will reduce the risk of loss. If ammonia can be smelled during application, it is a clear sign that it is being lost from the soil. In that case, the producer should either adjust the equipment setup to improve sealing, aim for a deeper injection, or wait until the soil has adequate moisture

Concerning crop progress, County ANR Extension Agents report that planting field peas, canola and spring wheat is 50-70% complete in Golden Valley County. Similar progress is reported in Adams County. In McKenzie County, 50% of the small grains have been planted, with field peas surpassing that number and lentils trailing behind. Planting in Bowman County is behind from previous years, at 30-40% of the spring wheat and canola planted. Similar conditions have been reported from Grant County, although part of the delay has been caused by excess moisture in April.

In Counties further North, like Renville, Bottineau and McHenry, field activities have just started, with some fertilizer being applied and some small grains being planted.

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