North Dakota State University
CROP & PEST REPORT

NDSU EXTENSION

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Inside this Issue...

CORN ROOTWORM TRAPPING NETWORK 1
2025 IPM CROP SURVEY – WHEAT & BARLEY INSECT PESTS 3
2025 IPM CROP SURVEY- SOYBEAN INSECT PESTS 5
2025 IPM CROP SURVEY – SUNFLOWER INSECT PESTS 7
CORN DISEASE SURVEY SUMMARY AND THOUGHTS 8
BIOLOGICAL DEGRADATION OF NEW WHITE MOLD SCLEROTIA 10
DUSTY SOYBEANS AT HARVEST... 11
END OF SEASON SCN SAMPLING 13
LOW FALLING NUMBER IN WHEAT, WHAT IS IT AND WHY DOES IT MATTER? 13
FARMING, RANCHING AND WORK-LIFE STRESS 14
AROUND THE STATE..... 16
NORTHEAST ND..... 16
SOUTH-CENTRAL/SOUTHEAST ND 16
FARM SAFETY – PREVENT COMBINE FIRES 19

entomology

CORN ROOTWORM TRAPPING NETWORK

This is the last update for the corn rootworm monitoring network in southeastern North Dakota. Trap results are also on the IPM website.

Trap Economic Threshold (E.T.): A capture rate of **14 or more adults per trap per week** indicates a high rootworm population and high risk for corn damage for the 2026 season. *A management strategy will be needed for corn rootworm control in that field.*

We captured a total of 831 beetles from September 18 to 24 (week 8), and 111 beetles from September 25 to October 1 (week 9) (Table 1, page 2). One western corn rootworm beetle was trapped in week 8 and none in week 9. Only the Cass County field near Argusville was above the E.T. during weeks 8 and 9. Corn rootworm numbers are declining rapidly as expected for the fall.

For the season's cumulative total, 4,854 beetles were trapped at ten trapping sites in six counties. The majority of the corn rootworms trapped were northern corn rootworms (99.8%, 4,845 beetles), compared to western corn rootworms (0.2%, 9 beetles). The highest trap sites were Cass County field 1 near Argusville (a total of 2,352 beetles), Sargent County field 2 near Gwinner (a total of 900 beetles) and Richland County field 1 near Colfax (a total of 613 beetles). The lowest trap sites included Steele field 1 near Finely (a total of 9 beetles) and Barnes field 2 near Rogers (a total of 16 beetles). The remaining trap sites ranged from a total of 106 to 241 beetles. See the corn rootworm trapping map and Table on the next page.

We thank Miro Grant for monitoring the traps and the North Dakota Corn Council for their support.

Northern corn rootworm on sticky trap (Patrick Beauzay)

Corn Rootworm Trapping

Season Final, 2025

July 30 – October 1, 2025

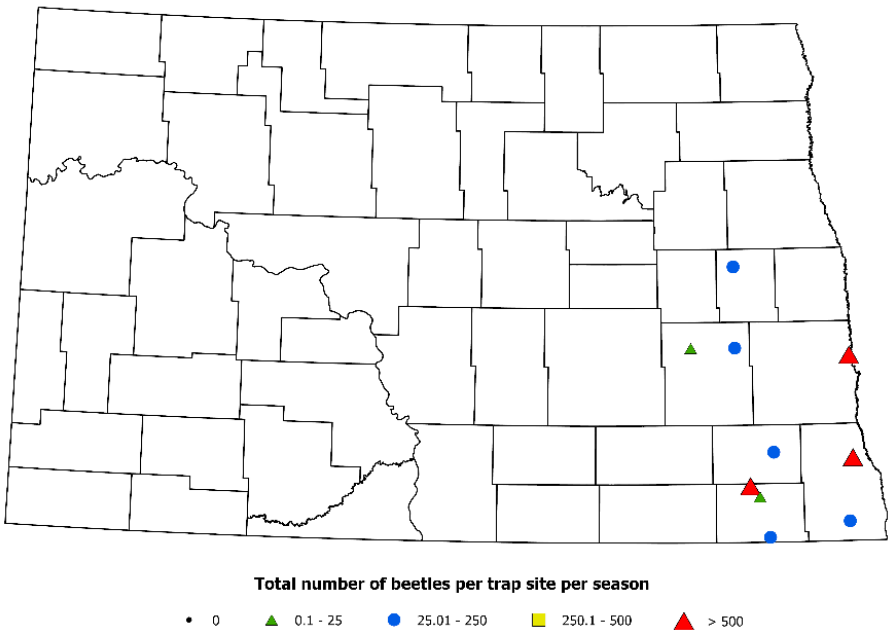

Table 1. Average number of adult corn rootworms (both northern and western) per trap per week in ND field corn, 2025.

Area	County	Nearest town	July 30 - Aug 6	August 7 - 13	August 14 - 20	August 21 - 27	August 28 - Sept. 3	Sept. 4-10	Sept. 11-17	Sept. 18-24	Sept. 25- Oct. 1	Cumulative Total NCW & WCR
SE	Barnes 1	Pillsbury	0.0	0.0	1.3	1.5	1.0	3.5	**14.3**	2.8	2.0	106
SE	Barnes 2	Rogers	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.8	0.3	16
SE	Cass 1	Argusville	3.0	4.5	**20.3**	11.4	**39.3**	**40.0**	**301.5**	**152.0**	**14.3**	2352
SE	Ransom 1	Lisbon	0.3	0.5	5.3	4.1	6.5	9.5	**17.3**	11.8	2.3	232
SE	Richland 1	Colfax	3.0	3.3	9.8	**16.7**	**23.5**	**25.3**	**59.0**	8.8	1.3	613
SE	Richland 2	Hankinson	0.8	4.5	7.5	3.0	2.0	2.5	**15.3**	2.3	0.8	156
SE	Sargent 1	Havana	0.8	2.5	4.3	4.7	10.3	6.3	**22.0**	5.5	3.3	241
SE	Sargent 2	Gwinner	4.3	**16.8**	**23.0**	**13.5**	**50.5**	**30.5**	**69.5**	13.8	1.0	900
SE	Sargent 3	Gwinner 2	-	-	-	4.9	12.3	11.0	**17.0**	8.5	2.8	9
SE	Steele 1	Finley	0.0	0.0	0.0	0.0	0.5	0.0	1.0	0.8	0.0	229
		Total # corn rootworm	**48**	**128**	**285**	**279**	**583**	**514**	**2075**	**831**	**111**	**4854**
		Percentage of NCR =	**100%**	**100%**	**100%**	**100%**	**99.7%**	**100%**	**99.7%**	**100%**	**100%**	
		Percentage of WCR =	**0%**	**0%**	**0%**	**0%**	**0.30%**	**0%**	**0.30%**	**0%**	**0%**	

Economic thresholds (ET) is an average of 14 or more adults per trap per week (regardless of species).

Red highlighted text indicates that the corn field is at or above ET

Janet J. Knodel
Extension Entomologist

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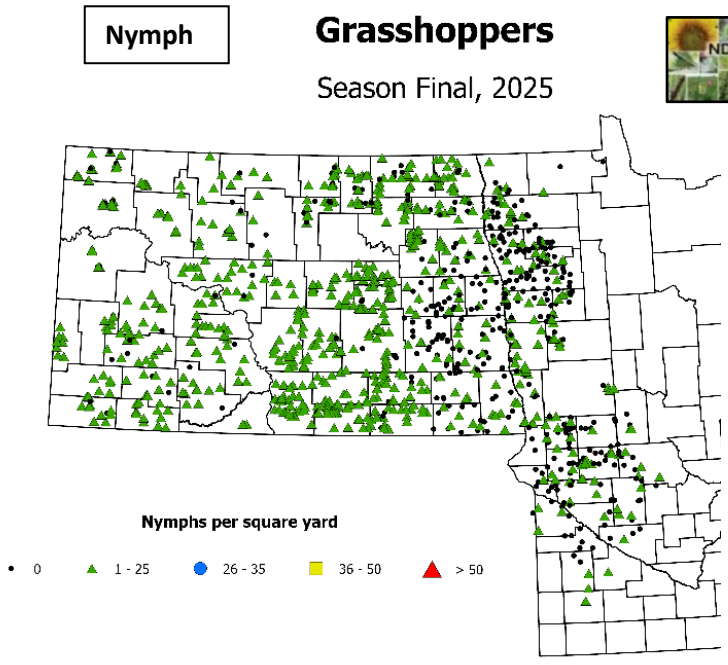
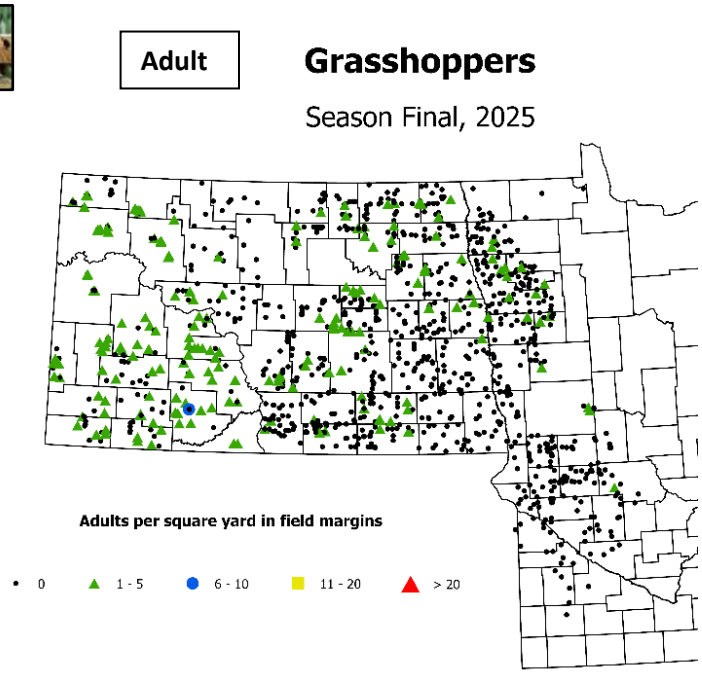
2025 IPM CROP SURVEY – WHEAT & BARLEY INSECT PESTS

The IPM (Integrated Pest Management) Crop Survey helps North Dakota farmers, crop consultants, and ag audiences stay up-to-date on important diseases and insect pests of wheat and barley grown in North Dakota. Eight IPM scouts and insect trappers operated out of the Dickinson Research Extension Center, the North Central Research Extension Center (Minot), the Carrington Research Extension Center, the Langdon Research Extension Center, the Williston Research Extension Center and the Fargo Agricultural Experiment Station.

NDSU IPM field scouts surveyed a total of 424 wheat fields (winter wheat, hard red spring wheat, durum wheat) and 63 barley fields for 18 diseases and 6 insect pests in North Dakota. The survey started on June 1st and continued through August 15th. Crops were surveyed from the 2-leaf stage (seedling) through ripening stages. IPM survey data/maps provided near-real-time pest information to North Dakota farmers and others in agriculture, assisting with scouting and pest management decision-making. Pest maps from the 2025 IPM Survey in North Dakota were uploaded weekly onto the NDSU IPM website. Key highlights of insect pests affecting wheat and barley in North Dakota are summarized below.

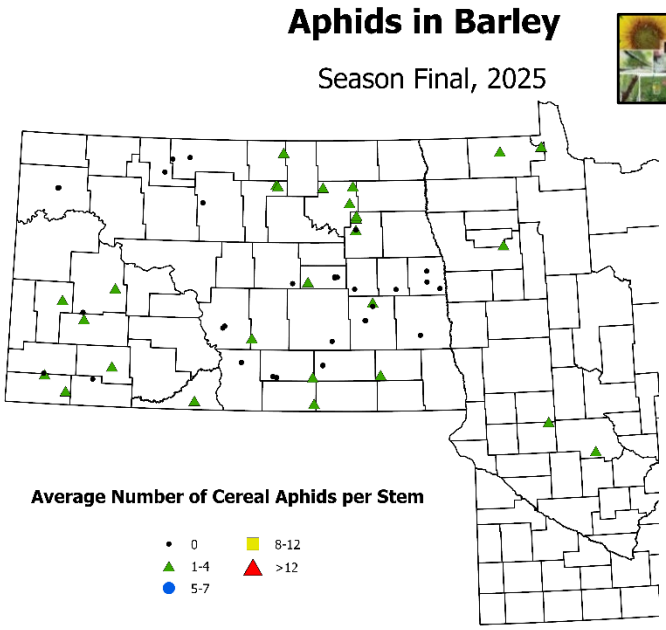
Grasshoppers – Grasshoppers were surveyed in all crops, including wheat, barley, soybeans and sunflowers. Adult grasshoppers were observed in 74% of the fields surveyed, 986 field tots in North Dakota. This indicates a lower prevalence of grasshoppers in 2025 compared to 83% in 2024 and 68% in 2023, and significantly lower than in the previous drought years (90% in 2022, 91% in 2021 and 2020, and 86% in 2019). The number of adult grasshoppers per 4 sweeps (1 yd^2) ranged from 0 to 6 in 2025, compared to a high of 76 in 2024. The number of nymph grasshoppers per 4 sweeps (1 yd^2) ranged from 0 to 16 in 2025.
Overall, the 2025 grasshopper densities were much lower in North Dakota. The cool and wet conditions from mid-May to June 2025 helped to decrease the severity of grasshopper populations and damage to field crops in most areas.

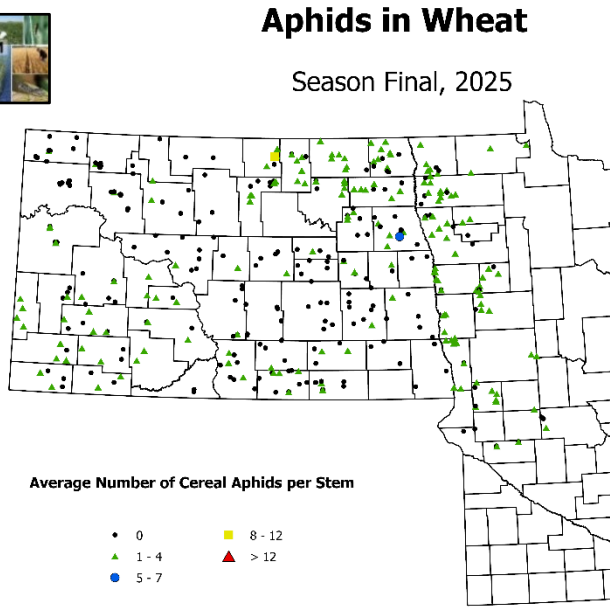




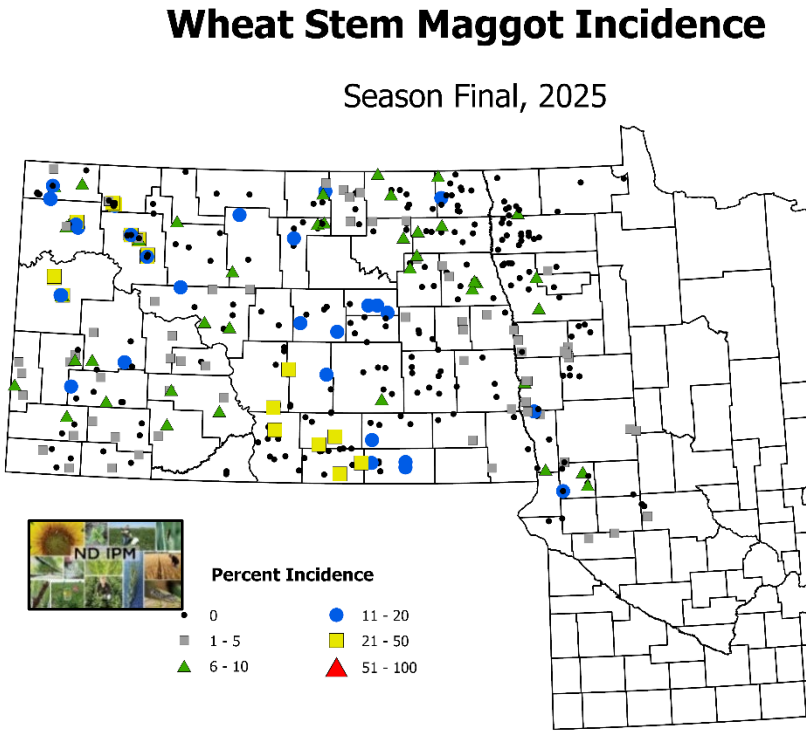
Insect Pests of Small Grains:

Grain aphids were observed in 25% of the wheat fields in 51 counties and 40% of the barley fields in 29 counties in 2025. Compared to 2024, this was a lower incidence of 29% in wheat and a higher incidence of 21% in barley. Grain aphids were first detected in mid-June, with the highest populations in mid-July in the northeast regions of North Dakota. In wheat, the average number of aphids per stem ranged from 0.2 to 7.8. In barley, the average number of aphids per stem was non-economic (ranged from 1 to 3) compared to wheat. Most of the wheat fields surveyed were below the economic threshold (E.T.). Wheat and barley fields that reached E.T. are shown in yellow squares or red triangles on maps.

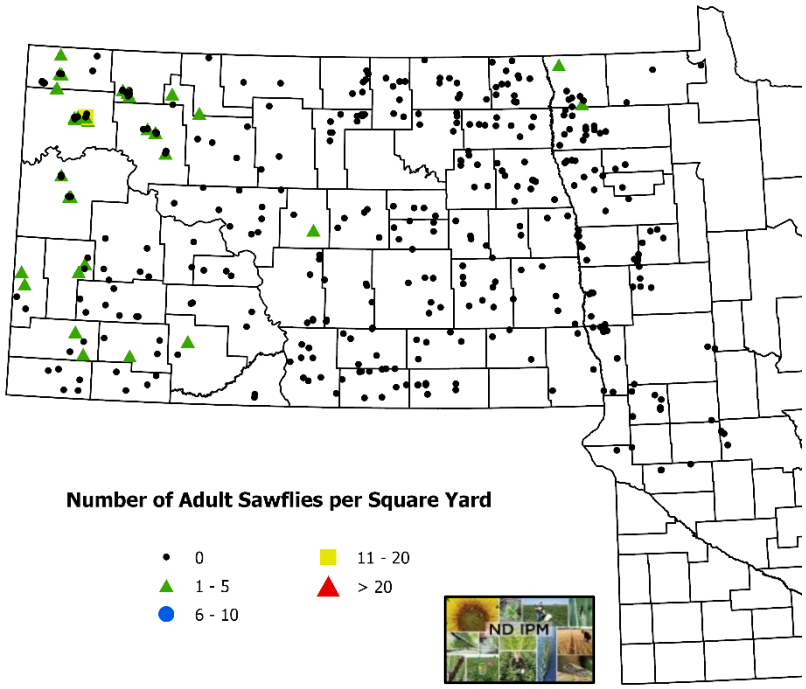




Wheat stem maggot was observed in 32% of wheat fields surveyed in North Dakota from late June through early August, and damaged white heads ranged from 2 to 48%. In 2024, a lower prevalence of wheat fields was infested, with 17% of fields affected, and 1 to 36% of the heads damaged. In 2025, wheat fields with more than 20% of their heads damaged were observed in the following areas: northwest Burke, Mountrail, and Williams counties; west-central McKenzie County; south-central Burleigh and Emmons counties; and southeast Logan and McIntosh counties. Overall, populations of wheat stem maggot were higher in 2025 than in 2024.



Wheat stem sawfly was collected using 15-inch sweep nets in 8% of the wheat fields surveyed from late June to late July, with a peak in mid-July in 2025. Numbers of adult sawflies per 20 sweeps ranged from 1 to 71 adults or 0.2-14.2 wheat stem sawfly adults per square yard. Wheat stem sawfly was most common in the northwest (Burke, Divide, McKenzie, Williams counties), and southwest (Golden Valley, Hettinger, Morton, Sioux, Stark counties); and west central (Oliver County).



Cereal leaf beetle

No new county detections of the cereal leaf beetle were observed in North Dakota in 2025. Cereal leaf beetle was first detected in 2000 in Williams and McKenzie counties, North Dakota. Since then, 13 counties are positive for the cereal leaf beetle:

- Northwest: Burke, Divide, McKenzie, Mountrail and Williams
- North central: McHenry, Renville and Ward
- Southwest: Golden Valley and Mercer
- Northeast: Cavalier, Nelson and Grand Forks.

Barley thrips were not observed in barley fields surveyed in 2025 or 2024.

2025 IPM CROP SURVEY- SOYBEAN INSECT PESTS

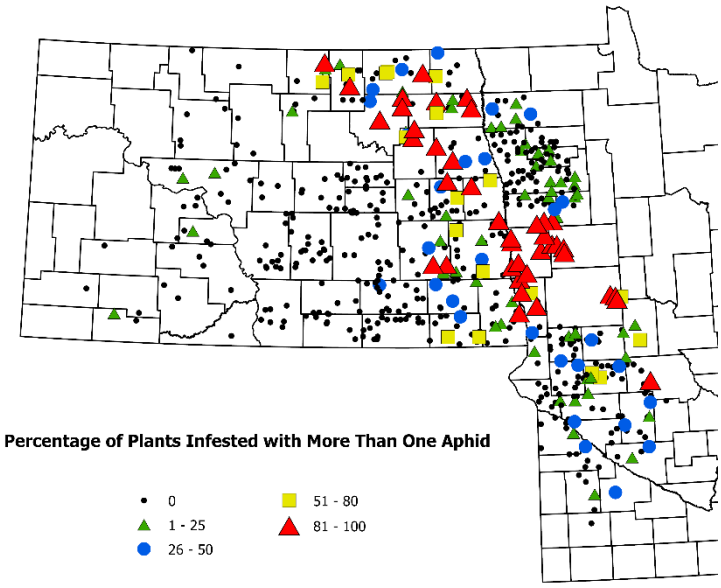
NDSU IPM scouts surveyed a total of 335 soybean fields in 43 counties of North Dakota during 2025. The survey was initiated in early June and continued through August 15. Soybeans were surveyed from the VE stage to the R6 growth stage. Key highlights of insect pests affecting soybeans in North Dakota are summarized below.

Soybean Insect Pests:

Soybean aphids – Soybean aphids were observed in about 24% of the soybean fields surveyed in 2025. This was similar to 2024. Soybean aphids were observed from early July to mid-August, primarily in the Red River Valley area of North Dakota and Minnesota. The percentage of plants infested with soybean aphids in fields ranged from 5% to 100%. The average number of aphids per plant was 25, ranging from 1 to 406 aphids per plant. Most of the positive fields were located in the southeast and northeast areas of North Dakota. Only one field surveyed reached the economic threshold (E.T.) level for soybean aphids in Walsh County (average of 250 aphids per plant, 80% of plants infested with one or more aphids and increasing population levels). However, more soybean fields were treated for soybean aphids based on calls to Extension Entomology. Soybeans were planted later in northeastern North Dakota, which favored the development of soybean aphids. Pyrethroid-resistant soybean aphids were reported in the Red River Valley region.

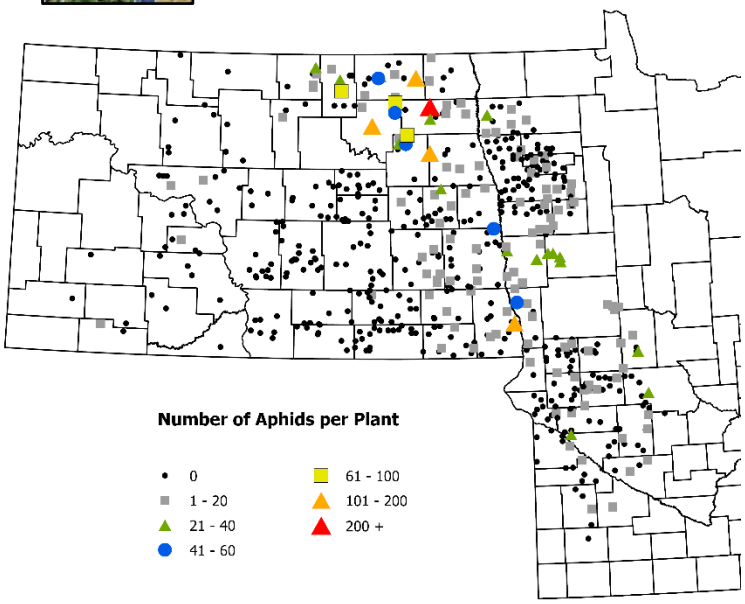
Soybean Aphids Incidence

Season Final, 2025



Soybean Aphids

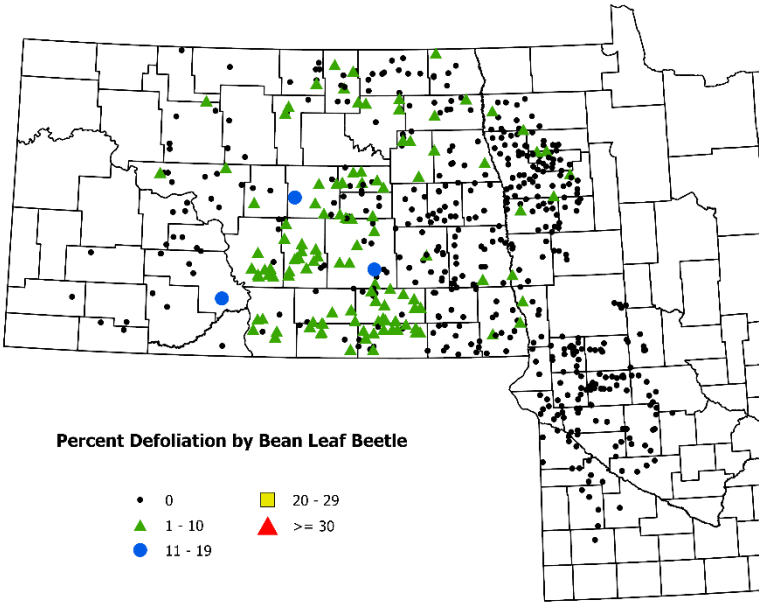
Season Final, 2025



Bean leaf beetles continue to be a pest further west and north in North Dakota. Beetles were detected in sweep net samples and by defoliation estimates in soybean. Defoliation was observed in 31% of the fields scouted, with defoliation levels ranging from 1 to 14%. Bean leaf beetle was present in southeast, northeast, south central and central North Dakota in 2025. Most of the soybean fields surveyed were not at economic levels for bean leaf beetle. However, a second generation of adult bean leaf beetles occurred in late August through September. Extension Entomology received more calls about bean leaf beetles causing late damage to seed pods due to the warm and dry weather.

Soybean - Bean Leaf Beetle

Season Final, 2025



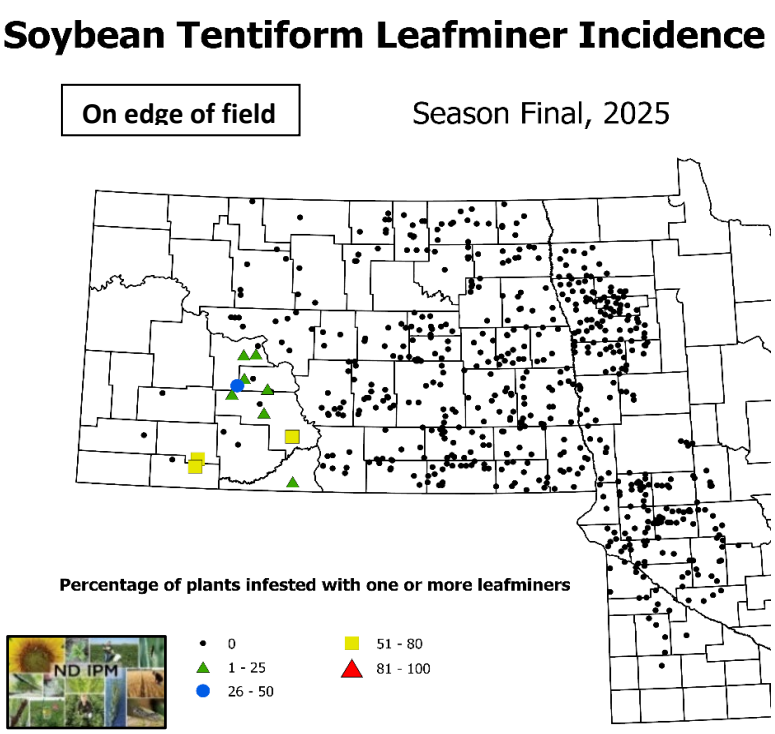
Spider mites were not a pest problem in soybeans in 2025 (or 2024) and were observed in only one soybean field.

No new records of **soybean gall midge** were detected in North Dakota in 2025, just like 2024 and 2023. The only positive detection has been in Sargent County, near Gwinner, in 2022, and no additional infestations have been found to date. A total of 335 fields in 43 counties were surveyed in 2025 and found to be free of soybean gall midge. This is continued good news for the North Dakota soybean growers!

Soybean tentiform leafminer (*Macrosaccus morrisella*), a potential new insect pest of soybean, was observed in six new counties in south central and southwest, including Adams, Hettinger, Mercer, Morton, Oliver and Sioux counties. Last year, it was also found in four new counties: Barnes, McLean, Mercer and Oliver. In 2023, it was first detected in Cass, Griggs, Ransom, Sargent and Traill counties. To date, it has been found in 15 counties of North Dakota.

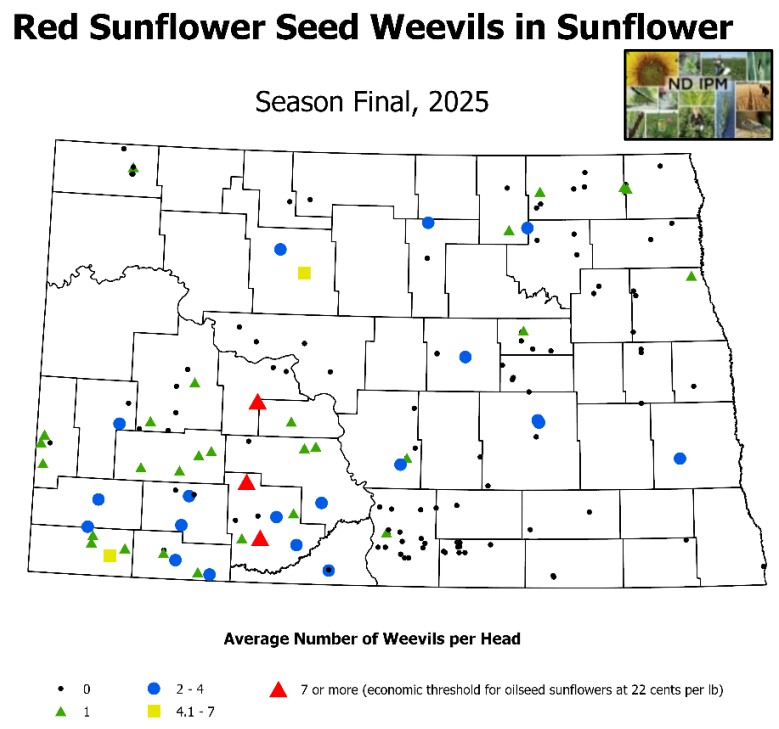
The incidence of plants infested with soybean tentiform leafminer ranged from 5 to 80%, with an average of 27% incidence on field edges.

This insect was first found on soybeans in Minnesota in 2022. Larvae create tentlike leaf mines in foliage, causing defoliation. Little is known about its pest management. So far, this insect has not reached a high enough population or caused sufficient defoliation to significantly impact soybean yields in North Dakota.



2025 IPM CROP SURVEY – SUNFLOWER INSECT PESTS

NDSU IPM scouts surveyed a total of 164 sunflower fields across 41 counties in North Dakota in 2025. The survey was initiated in early June and continued through August 15. Sunflowers were scouted from the 2-leaf through R6 growth stages. Key highlights of insect pests affecting sunflowers in North Dakota are summarized below.



Red sunflower seed weevils had higher populations in 2025 compared to 2024. Weevils were observed from R2 through R5 (flowering) from late July to mid-August. The average number of weevils per head ranged from 1 to 51, with an average of 2.8 weevils per head. Approximately 21% of the weevils were found at the field edge, and 19% were found within the field. In 2025, the E.T. for red sunflower seed weevils was more than 7 weevils per head for oilseed sunflowers, depending on market price, insecticide + application costs and plant populations. Approximately 6% of the fields surveyed at R5 were above the E.T., and these fields required an insecticide application. The highest populations were located in southwestern North Dakota.

Acknowledgments: We appreciate the assistance of Darla Bakko, Barb Niles, and Dr. Honggang Bu. Special thanks to the following individuals who assisted with IPM field scouting in North Dakota.

Ashlyn Williams, IPM insect trapper, DREC
Scott Knoke, ANR Extension County Agent, Benson County
Shelby Dietz, IPM insect trapper, CREC
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Thomas Crompton, IPM Scout & Insect Trapper, Fargo
Kartheek Chapara, IPM insect trapper, LREC
McKenna Schneider, IPM Scout, LREC
Samantha Turnquist, IPM insect trapper, WREC
Scott Roseth, IPM Scout, WREC

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Sam Markell, Extension Plant Pathology, Broad-leaf Crops
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Wade Webster, Extension Plant Pathology, Soybeans

plant pathology

CORN DISEASE SURVEY SUMMARY AND THOUGHTS

The corn disease survey (funded by the North Dakota Corn Council and North Dakota Department of Agriculture) was conducted from late August to the first week in October. Foliar disease pressure was very low prior to R5 (dent stage), however in corn fields scouted at R5 or beyond, high levels of foliar disease incidence and severity were observed. In general, the foliar disease levels of 2025 were the highest I have seen in the past 13 years. Possible reasons for why we saw high disease levels could be the extended warm Fall with sufficient leaf moisture periods (rain or dew) to drive disease development. Based on field observations and conversations with agricultural professionals, the late development of foliar diseases (past R5) likely did not contribute to significant yield losses. Below are summaries of `four corn diseases commonly observed in the past three weeks.

Northern corn leaf blight (NCLB) is a residue-borne disease and historically has been found at low levels in the ND corn fields (a few plants with a lesion or two in a field). This year, we documented NCLB in 86% of the fields, with relatively high severity on infected leaves (Figure 1). Given it is a residue-borne disease, it is possible we will enter 2026 with enhanced levels of NCLB inoculum that could result in greater risk if the environment promotes disease development.

Figure 1. Northern corn leaf blight lesions on several plants. Photo taken on September 12.

Southern rust and common rust do not overwinter in the state and are dependent on southerly winds/storms to carry spores northward. In 2025, southern rust was first documented on August 18 (very early), and high incidence and severity levels occurred late in the growing season. This year common rust was recorded in 91% of the fields and southern rust was recorded in 87% of the fields. The high levels of southern rust can be linked to higher-than-normal southern rust epidemics in states south of ND, such as Iowa and southern Minnesota.

Tar spot is a residue-borne disease that was first identified in ND in 2024 in 10 counties. In 2025, tar spot was confirmed on September 12 at very low levels in a few fields in Cass and Richland County. On Monday October 6th, I scouted 10 fields in Richland and Cass Counties and found tar spot in all 10 fields. Incidence (number of plants infected) was higher than what was observed in 2024, and severity was low in most fields. In one field, it appears a successful overwintering event of tar spot occurred resulting in a 'hot spot' of high incidence and severity (Figure 2). Given this observation, it is possible that we may see earlier occurrences of tar spot in 2026, and tar spot identification should be added to early scouting efforts in corn.

Crown rot and premature death (ghosting) of corn plants was observed at low levels throughout the corn survey (Figure 3). During the late season scouting efforts, stalk rots and poor stalk integrity was observed at variable levels in fields (Figure 4). Stalk rots often become more frequent when corn has experienced several stressors during the growing season such as temperature shifts, moisture absence/excess, and other pest issues such as foliar diseases and insect damage. This results in the plant cannibalizing nutrients from the stalk and allocating those resources to the ear allowing pathogens to take advantage (infection) of the compromised stalk tissue. For both crown rot and stalk rot management, hybrid genetics is our best management tool. At this point in the growing season, prioritize harvest to the fields that have the highest incidence of lodging and/or poor stalk strength.

Figure 2. High tar spot incidence and severity within a localized hot spot in a field.

Figure 3. Three 'ghosted' plants in the middle of a corn field. Notice premature death of plant tissue. It is likely these plants lodged a few weeks later.

Figure 4. Corn stalk failing the push/pinch test. Poor stalk integrity and shredded pith at base of corn plant.

Andrew Friskop
Extension Plant Pathology, Cereal Crops

BIOLOGICAL DEGRADATION OF NEW WHITE MOLD SCLEROTIA

White mold was a major point of conversation this season with certain areas of North Dakota having severe yield losses due to this pathogen. Unfortunately, many of the white mold susceptible crops were impacted, and as a result new inoculum was produced. This new inoculum comes in the form of sclerotia, which are hardened overwinter structures that resemble rodent droppings. In work from soybeans, our research indicates that for every 10% increase in incidence (% of plants infected) of white mold on a susceptible soybean variety, there is an estimated 25.4 lbs/ac of new sclerotia produced. With this substantial amount of new inoculum produced, there will be a potential increased risk of disease implications during the coming seasons, especially if planting another crop susceptible to white mold such as dry beans, canola, or sunflowers.

As we are harvesting, there is one option that stands out as a potential tool to help break down these sclerotia so that they do not survive to become a major threat in future seasons. This is a biological control agent, *Coniothyrium minitans*, which is marketed as Contans®. This is a naturally occurring fungus that parasitizes and destroys the sclerotia of the white mold fungus. By reducing the number of viable sclerotia present in the soil, this biological control could potentially lower disease pressure.

Figure 1. White mold sclerotia is present in grain after soybean harvest.

The timing of application is critical for this tool. This product is most effective when applied in the fall after harvest and is incorporated soon after application into the top 2 inches of soil. Incorporation is essential, as the product needs to come into direct contact with sclerotia to parasitize and break them down. Fall applications provide the biological agent enough time to colonize and attack sclerotia before soils freeze, leading to greater reductions in the overwintering population. Spring applications are also possible but generally less effective, as there is less time for the biological degradation to occur before the next susceptible crop is planted. However, if planting a non-host crop such a corn or wheat, this could become an option.

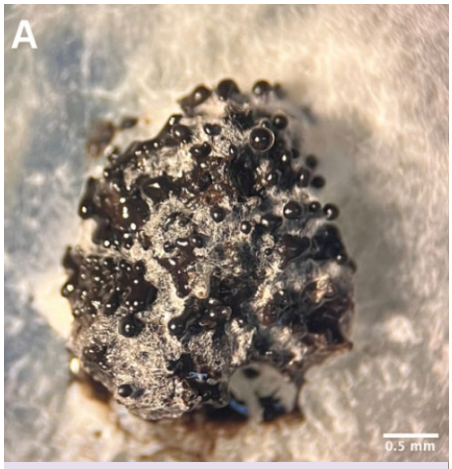

Figure 2. Image of a white mold sclerotia being infected and degraded by Coniothyrium minitans. Credit: Amit Sharma

It is generally recommended to target fields with a history of severe white mold pressure. The product is most likely to have significant reductions in situations where sclerotia are abundant and yield losses have been substantial in past seasons. Even within a field, applications can be focused on the pockets with the heaviest disease pressure, such as low-lying areas with dense canopy closure.

Wade Webster
Extension Plant Pathology, Soybeans
Sam Markell
Extension Plant Pathology, Broadleaf Crops

DUSTY SOYBEANS AT HARVEST

Over the past few weeks of harvest, I have received multiple phone calls about abnormally dusty soybeans. In some cases, these calls are also about black dust that is surrounding combines. When thinking about dusty soybeans there are a few diseases that could be the likely culprit behind these issues.

The first disease we often deal with is Diaporthe seed decay, caused by a combination of different species. When present, soybeans will be shrunk, shriveled, and can form a white chalky residue on their outer seed layer. Because of this, we can see reduced yields if this is present in fields. Often, this disease will show up as mature soybeans sit in fields for extended periods of time with late season rain and warm temperatures that favor the fungal growth. While there are varieties with varying degrees of resistance to seed decay, this is not very well characterized in commercial varieties. Any soybeans still waiting to be harvested across the state will be at increased the risk of this disease developing, especially across central North Dakota which had received precipitation this past week.

Figure 1. Diaporthe Seed Decay on soybean. Seeds that are infected have a shriveled appearance with chalky mold that develop. Credit: Albert Tenuta and Daren Mueller.

The second disease that has been on my radar has been anthracnose stem blight. This disease is often identified with irregularly shaped black lesions that develop on the stems and pods of soybeans. While infections can occur during early growth stages during pod development, this year infections are most prevalent at fully maturity, and as a result I am not expecting yield losses due to this pathogen. Because of the presence of this disease, there could be black dust created at harvest. One common misunderstanding with this pathogen is the similar name to Anthrax that can cause concerns with livestock. Anthracnose is completely unrelated and poses no lethal threat to humans or livestock.

The third disease that can contribute to dusty soybeans at harvest is pod and stem blight, caused by several species of *Diaporthe*. This disease is most commonly identified by the presence of small black fruiting bodies (pycnidia) that form in linear rows on soybean stems, pods, and occasionally on the seed. While infections can occur earlier in the season, symptoms are often most noticeable at maturity. In severe cases, pod and stem blight can reduce seed quality by producing discolored, cracked, or moldy seed, which can add to harvest dust issues. Unlike anthracnose, which tends to appear more sporadically, pod and stem blight often presents in patches across fields, especially in years with prolonged wet weather at the end of the growing season. While yield losses are generally minimal when infections occur late, the main concern is reduced seed quality that may impact grading and marketability.

Figure 2. Anthracnose stem blight on mature soybean plants. Credit: Crop Protection Network

Figure 3. Pod and Stem Blight on soybean stem and pod. Note the small black pycnidia are present in a linear row on the soybean stem. Credit: Craig Grau

In addition to true soybean pathogens, it is common to see the development of saprophytic fungi on mature plants and pods left in the field. These fungi colonize dead or dying tissue without causing disease. While they do not reduce yield directly, they can create dusty black or gray residue during harvest that may be mistaken for disease. Similar to other fungi, they are favored by wet conditions late in the season and extended periods of delayed harvest.

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Soybean Pathology

END OF SEASON SCN SAMPLING

Soybean cyst nematode (SCN) remains one of the top yield-limiting pests of soybean due to its ability to form resilient cysts in the soil that prolong survival for many seasons. Early and accurate detection is incredibly important for management, and soil sampling at the right time and place is critical to understanding what is present. Without sampling, it is nearly impossible to know if SCN is present or whether populations are increasing in a field.
The ideal time to sample for SCN is in the **late season (September–October)**, either just before or shortly after harvest, when egg levels in the soil are at their peak and give the most reliable estimate of population pressure. Use a soil probe or shovel to collect cores from about 6 to 8 inches deep in the root zone, taking 10–20 small cores across the area of interest and mixing them into a composite sample. From the mixed soil, place about 2 cups of soil into a sample bag and submit it promptly to a diagnostic lab. Avoid sampling frozen or overly wet soils, which may reduce egg recovery. North Dakota farmers are also eligible for the free SCN testing program, which is described in the Crop and Pest Report #9. Because SCN is often unevenly distributed across a field, it's recommended to use a targeted strategy. For fields already known or suspected to have SCN, it is recommended to focus on areas with stunted plants or yields that are lower than expected. In fields with no history of SCN, **sampling** should be performed around field entrances, headlands, or low-lying areas.

Once egg counts are determined, they can be used to guide management. Low levels may only require rotation and resistant varieties, while higher levels indicate that more aggressive management strategies are needed to protect long-term yield. Regular soil sampling every few years is the best way to monitor shifts in SCN pressure and track how well resistant varieties or other management strategies are holding up.

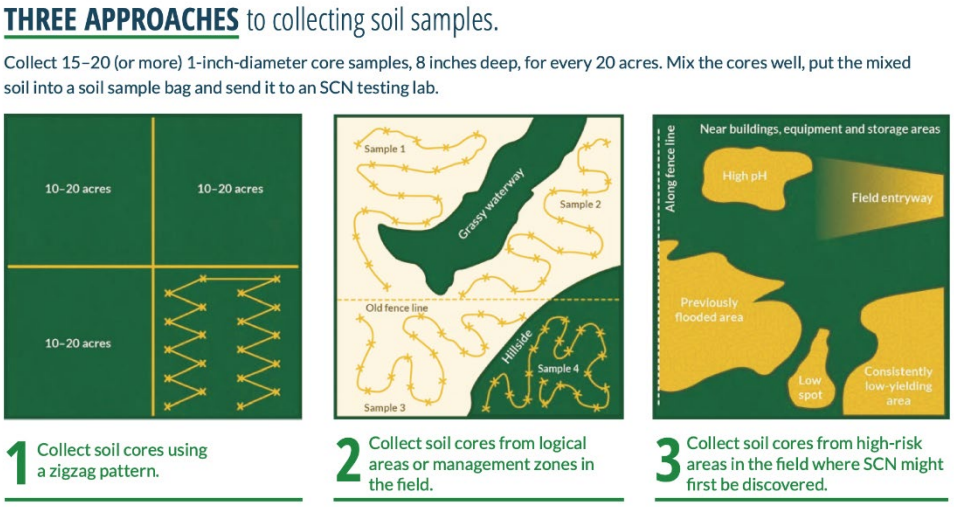


Figure 1. Examples of how and where to sample fields. Credit: SCN Coalition.

Wade Webster
Extension Plant Pathology, Soybeans

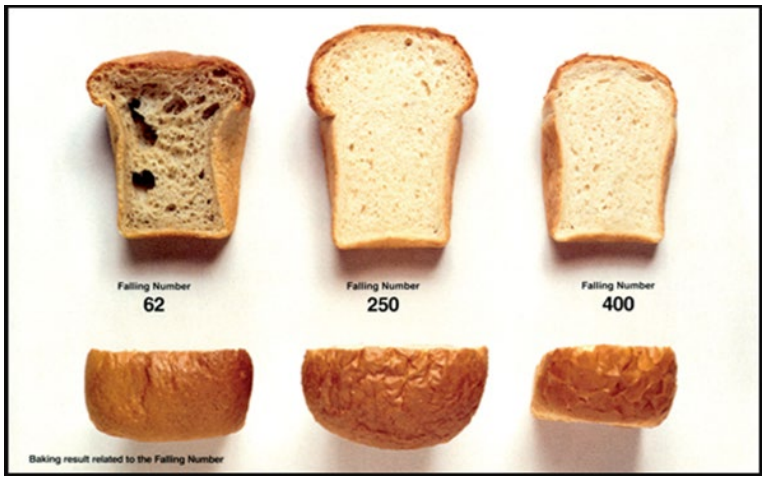
plant science

LOW FALLING NUMBER IN WHEAT, WHAT IS IT AND WHY DOES IT MATTER?

With hard red spring wheat being delivered to the elevators over the past weeks, we are starting to get a picture of 2025 crop quality. Overall, reports are generally good with average to above average yields and average protein levels. A few reports of high DON (a vomitoxin produced by the head scab pathogen) grain have come in, but thankfully, they are not widespread nor are they at levels comparable to some of our historically bad years for scab, e.g., 2016. I have been hearing some scattered reports of low falling numbers, especially in areas that received rain in mid August through early

September on ripe grain along with accompanying questions about the test and what it means. So for a quick primer, here are some basics about the falling numbers test.

The falling numbers test, formally known as the Hagberg-Perten Falling Number Test (HFN), is used to measure starch damage in flour. If mature wheat seeds, i.e., ripe grain, absorb enough moisture to begin the process of germination, enzymes in the endosperm are activitated and begin to break down the starch in the seed to feed a germinating wheat plant. While this is a necessary process for germination, it is not a good thing for grain whose end use is to be milled into flour. When the long, complex starches of the endosperm are broken down by these naturally-ocurring enzymes, the starch is no longer intact and cannot support the expanding matrix of a leavened (yeast-containing) baked good like white bread and the loaf fails to rise or collapses. Essentially, the falling numbers test is an objective measurement of pre-harvest sprout damage which allows a buyer to get a sense of how well flour made from that grain is likely to perform in their products. Typically, most elevators will discount wheat if it has an FN < 300. The University of Minnesota rates spring wheat varieties included in their variety trials for susceptibility to pre-harvest sprout damage. To check the score for varieties you have planted or are considering, you can find these ratings here: https://varietytrials.umn.edu/spring-wheat . To help visualize what bread made from low FN wheat can look like, see the image below from the University of Vermont Extension. The bread on the left was made from flour with FN = 62, the loaf in the middle from flour with FN = 250, and the loaf on the right from flour with FN = 400.



Clair Keene
Extension Agronomist Small Grains and Corn

farm health and wellness

FARMING, RANCHING AND WORK-LIFE STRESS

What images come to mind when you think of stress in farming or ranching? They might include:

- Running into town to buy spare parts.
- Listening to the radio and hearing the market drop on prices.
- Rushing to get work done before a storm.
- Working late into the night putting in a crop, handling animals or fixing equipment.
- Feeling fatigue, discouragement, or continuing frustration.

Despite such stresses, often folks do not reveal the stresses they face or talk about the frustrations they feel as they work on the farm or ranch.

Individuals or families in farming or ranching often experience pressures and uncertainty, especially during times of harvesting and planting. If feelings of frustration and helplessness build up and are not managed, they can lead to intense family problems involving one's spouse, children, parents or other relatives. If left unresolved, these stressful conditions can lead to costly accidents, health concerns and deaths.

Understanding Work-Life Stress
In the engineering field, **stress** refers to the capacity to withstand strain. Structures have a measurable strength and resistance to strain according to the type and size of material. If overloading occurs, the structure distorts and breaks.

Work-life stress refers to demands and pressures occurring in work settings that "spill over" into the rest of one's life. When applied to people, stress is more complex. Everyone takes in energy (strength) from the sun, air and food. When people remain relaxed and balanced as they go about their daily tasks, this energy flows in and out of their bodies in a healthy, harmonious way, but when they become mentally overwhelmed, physically fatigued or otherwise have difficulties due to work-life pressures, then they become "stressed out"—a recipe for health problems and other concerns.

You always have multiple choices in responding to and managing stress. Learning to identify your stresses, using healthy coping strategies, and managing your resources will help you develop a better work-life balance. Ideas and strategies for doing so are shared in the other fact sheets in this series.

Access Helpful Resources
Put your health first, because your health is the most important resource and what allows you to be resilient during times of stress. Take care of yourself.

To learn more specifically about farm/ranch life and work-life stress, read the NDSU Extension publication FS282, "Farming, Ranching and Work-Life Stress" – link: https://www.ndsu.edu/agriculture/extension/publications/farming-ranching-and-work-life-stress.

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.

Caption: Put your health first, because your health is the most important resource and what allows you to be resilient during times of stress. Take care of yourself.

Sean Brotherson
Extension Family Science Specialist

Adriana Drusini
Extension Farm and Ranch Stress Program Coordinator

around the state

AROUND THE STATE

NORTHEAST ND

Small grains harvest is largely complete, with generally favorable reports on both yield and protein levels. However, later-harvested grain suffered from lower falling numbers due to prolonged wet and humid conditions.
Canola harvest is mostly wrapped up across the region, with reported yields ranging from 1,500 to 2,500 lbs/acre. Survey results indicate high disease pressure in canola this season, including white mold, verticillium wilt, and isolated cases of clubroot.

Soybeans, dry beans, and sunflowers are now ready for harvest. Weekend rainfall temporarily disrupted harvest operations in many areas. Farmers who were able to get into soybean fields are reporting decent yields between 30 and 50 bu/acre. However, wet conditions during the flowering period contributed to significant white mold pressure in soybeans.

Sunflower fields are looking good overall, though Sclerotinia is present in some areas, causing stalk rot, wilt, and head rot.

Most corn is not yet ready for harvest, though a few early fields are being combined in Grand Forks County. Waterhemp is becoming more noticeable in soybean and sunflower fields, adding to the weed management challenges this season.

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SOUTH-CENTRAL/SOUTHEAST ND

Hard red spring wheat, canola, and buckwheat harvest has finally been complete in this region as of last week. It sure took a long time to get the hard red spring wheat harvested.

Photo 1: Kernel of corn has reached R6 (black layer – physiological maturity)

Corn in the region is between early R5 (dent) stage (milk line present to R6 (physiological maturity [black layer]) (photo 1). Corn in Sargent, Richland, and southern Cass Counties is mostly black layered, but as you travel north and west a lower percentage of corn has reached the R6 stage. The cold weather October 6th and 7th, has killed some corn in the northern parts of the region that were not at the R6 stage. Eddy and Wells Counties only have about 30% of corn acreage at the R6 stage. It takes about 15 days for corn at the ½ milk line to reach the R6 stage. Thank goodness for the hot temperatures the last two weeks, or more corn would not be at the R6 stage right now. Corn grain moisture at R6 is about 35%. When daily average air temperatures are around 55 degrees F, only about 0.4% moisture is lost per day. If corn just reached the R6 stage today and average daily air temperatures are only 55 degrees F, it will take

49 days for the corn to dry down in the field to 15.5% moisture. Let's hope we have some more hot weather to get the corn dryer. The least corn damage at harvest occurs when corn moisture is at 22%, meaning the corn will need to be dried to reach storage moisture of 15.5%. Corn harvest has begun in the southern part of the region and a partial field was harvested in Foster County. I have not heard any yields yet, but corn moisture in harvested fields is ranging from 14 to 25% moisture. A report in Emmons County reported only 52 pounds/bushel test weight where corn was frozen in early September. I have found multiple fields now in multiple counties having many "ghosted" corn in Kidder County. Still finding northern corn leaf blight in many corn fields in the region (photo 2 in Griggs County). I can find corn ear molds infrequently in most corn fields (photo 3 in Griggs County). I have also seen severe squirrel damage in corn along the edge of Cooperstown.

Photo 2: North corn leaf blight lesion in a Griggs County corn field.

Nearly all soybeans have reached physiological maturity and harvest progress in the region ranges from 15% in Wells County to up to 85% in Richland and Emmons Counties. Across the region soybean yields are disappointing according to most farmers. Field averages are ranging from 15 to 60 bushels/A with the most consistently higher yields in the western part of the region. One farmer in Griggs County reported a farm average of only 22 bushels/A after harvesting 1,300 soybean acres. Soybean moisture has been very dry, down to 8%, in some cases last week during the high temperatures. Soybean test weights are between 56 to 60 pounds/bushel. One soybean field in Emmons County had severe defoliation from bean leaf beetles on virus infected soybean plants that had no pods and stayed green. Based on this, most plants had at least one pod per plant showing bean leaf beetle feeding damage (photo 4 Emmons County). Photo 5 shows how the seed was disfigured and turned moldy due to the feeding damage with the pod opening up prematurely.

Photo 3: Ear mold in a Griggs County corn field

Photo 4: Bean leaf beetle soybean pod feeding.

Photo 5: The results of opening the pod having the bean leaf beetle damage and showing negative impact on seed quality.

Most dry beans have been harvested now throughout the region, with yields being disappointing like soybean. There are some great yields, but those types of fields are infrequent. Many dry bean fields are yielding poorly and seed quality in a few fields have been poor.

Sunflower harvest has begun in Logan, McIntosh, and Burleigh Counties already. I have not heard any yield reports as of yet. This is the year we conducted the National Sunflower survey. Sunflower diseases have been the most frequent yield limiting issues this year, especially in the southern to southwest parts of the region. There is a little less disease in the northern part of the region, but many diseases are still present. Photo 6 shows a Dectes stem borer found in a sunflower stem. Photo 7 shows some severe head rot in one field. Most fields had limited amounts of head rot in them. Only one sunflower field I was in had any frequency of powdery mildew.

Photo 6: Dectes stem borer larvae in an Emmons County sunflower field.

Photo 7: Sunflower head rot in Emmons County

Cercospora leaf spot is still causing damage to sugar beet plants. American Crystal finally started full harvest (piling) at midnight Tuesday morning (10-07-2025) while MinnDak is still in the pre-pile stage of harvesting.
I completed the soybean weed survey in Griggs County on September 28th. Photo 8 shows a severe infestation of waterhemp in a soybean field. Photo 9 shows on the left side how an off-label application of glufosinate was applied in the soybean field to try to reduce waterhemp seed production. The right side of the photo has many waterhemp plants not sprayed. Please check no-tillage fields for winter annual and perennial weeds. Photo 10 shows many large

Photo 8: Severe waterhemp infestation in a Griggs County soybean field

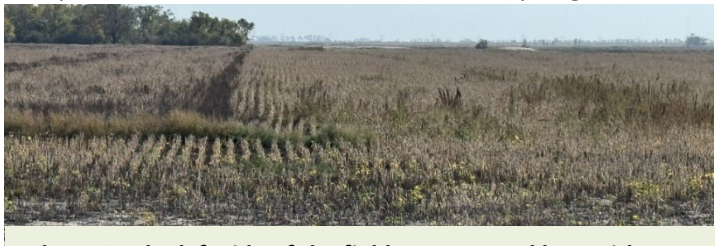

Photo 9: The left side of the field was sprayed late with an illegal glufosinate application and the right side of the field shows the numerous waterhemp plants in the field that were not sprayed.

horseweed (marestail) plants in a Foster County soybean field. Since most horseweed populations are resistant to glyphosate, 2,4-D at 0.75 pounds acid equivalent per acre should be mixed with the glyphosate. Just remember if foxtail barley is also present in the field, the 2,4-D will antagonize control of foxtail barley, so the glyphosate rate should be increased.

Photo 10: Many horseweed (marestail) plants in a Foster County soybean field.

Of the 27 NDAWN stations I've chosen this season across the region, the average maximum daily air temperature from September 23, 2025 to October 6, 2025 ranged from 76 degrees Fahrenheit near Finley, Hurdsfield, McHenry, and Wishek to 82 degrees Fahrenheit near Gardner, Milnor, Mooreton, Sonora, and Wahpeton, with an average of 79 degrees Fahrenheit, 4 degrees F above the last two weeks. The highest one-day maximum air temperature was 95 degrees F at Wahpeton which broke that day's record high at least according to Brekenridge, MN records by 6 degrees F. Most NDAWN stations in our region in the Red River Valley had one or two days of 90+ degrees F. The NDAWN stations reporting 90+ degrees F included Ayr, Galesburg, McKenzie, Casselton, Gardner, Hillsboro, Leonard, Mayville, Milnor, Mooreton, Sonora, and Wahpeton. The average daily minimum air temperature for the past two weeks at the 27 NDAWN stations ranged from 44 degrees Fahrenheit near Pickardville to 53 degrees Fahrenheit near Wirch with an average of 49 degrees Fahrenheit, 6 degrees cooler than reported in the last Crop and Pest Report. The lowest air temperature in the region was 26 degrees F at Pickardville on October 6, 2025. Linton, McKenzie, Pickardville, Steele, Wing, and Zeeland Counties had temperatures below 30 degrees F on October 6th.

Rainfall across these 27 NDAWN stations ranged from 0 inch near Brampton, Casselton, Edgeley, Fingal, Leonard, Marion, Milnor, Mooreton, and Sonora to 1.7 inches near Wing with an average for the period of 0.41 inches, 1.2 inches less than the average reported in the last Crop and Pest Report.

Have a great weekend and please stay safe!

Jeff Stachler
Griggs County Extension Agent

FARM SAFETY – PREVENT COMBINE FIRES

The following article is reproduced from NDSU Agriculture Communication – Oct. 1, 2025

Daily maintenance and monitoring conditions are key to preventing combine fires. Equipment fires, specifically combine fires, are a serious threat during the harvest season.

Soybean and dry edible bean harvest is in full swing across North Dakota, with field corn and sunflowers to follow. Weather conditions have been very warm and mostly dry, with a few intermittent showers across the state. North Dakota State University Extension farm and ranch safety specialist Angie Johnson urges farmers to stay current on necessary maintenance and inspect conditions to prevent equipment failures and fires.

Use an air compressor or leaf blower daily when the machine is off and cooled down to remove dirt, dust, chaff, and other plant residue that has accumulated. (NDSU photo)

According to the North Dakota Agricultural Weather Network (NDAWN), the second half of September was roughly eight to ten degrees above average in temperature and many parts of western and southeast. North Dakota had a very dry September. Combine these warm, dry conditions with mature crops and dried biomass, such as pasture or rangeland, and a simple spark from an equipment failure can cause a massive fire in minutes.

“During harvest season, producers need to monitor their local conditions, as if their area is experiencing localized fires due to dry conditions, make smart fire prevention decisions”, says Tom Claeys, North Dakota state forester.

“Equipment fires, specifically combine fires, are a serious threat during the harvest season,” says Johnson. “No one wants to lose their combine or the remaining unharvested crop in the field due to fire. The biggest risk, however, is the loss of human life, as combines, crops and other equipment can be replaced – you cannot.”

While performing daily maintenance and making repairs, take time to examine your combine’s electric and hydraulic systems, advises Johnson. Properly route or restrain wires and hoses to prevent them from rubbing or being cut by moving parts.

“Hydraulic systems are prone to producing small leaks, and there may be oily residues from repairs,” says Johnson. “Hydraulic oil combined with crop dust provides a ready fuel source that will burn if ignited. It is very common for the fuel source to be crop residue or soybean dust.”

Soybean dust is a fine, fluffy material that accumulates on almost all machine parts. A combine that is not thoroughly cleaned periodically will have highly combustible material tucked into numerous places ready to become a fuel source for fire.

“If your combine is on fire, be sure to call your fire department right away,” says Rich Schock, chief of the Kindred Fire Department. “By calling early, before the fire engulfs your combine and spreads further, we can work towards helping you protect your investment while also keeping you safe and out of harm’s way.”

The dust and chaff produced by harvest crops can be ignited by many sources. Sources include:

- Worn or damaged bearings
- Engine components, such as the exhaust manifold and turbocharger, which produce exhaust gases exceeding 1,000 degrees Fahrenheit
- Friction between plant parts rubbing together
- Electrical shorts or arcs

Johnson urges farmers to consider the following tips for reducing the risk of combine fires while harvesting crops:

Perform a re-operational check. Take time to walk around the combine before the start of each day during harvest season to identify any damaged or worn parts.

Use an air compressor or leaf blower daily when the machine is off and cooled down to remove dirt, dust, chaff, and other plant residue that has accumulated. Always wear hearing protection, eye protection and respiratory protection, such as an N95 mask. While blowing off residue, inspect high-risk areas, such as the engine and engine compartments, hydraulic pumps and pump drives, gearboxes, batteries and cables. When cleaning, take time to look for any issues that require repair, such as leaking hydraulic hoses, which can be a perfect place for chaff to stick and build up, creating an easy fuel source for a fire.

Take time to service the machine daily, as outlined in the combine's operator manual. Grease and lubricate bearings and chains, and continue to look for areas that have excessive wear or damage.

Watch for wiring issues. Today's combines are controlled by many sensors and electrical components that are extremely complex. Take a moment to inspect the wiring systems to identify any wires that appear to be loose or damaged due to rubbing or contact with moving parts.

Use an infrared thermometer. Hot bearings are a combustion source. Warm up your combine before taking it to the field, and use an infrared thermometer to determine the operating temperature of your combine's bearings. Safely open the combine's shields, and from a safe distance, point the infrared thermometer at a bearing to read the measured temperature. If one bearing has a temperature much higher than the others, it may be worn or damaged. Plan to replace the bearing as soon as possible. Infrared thermometers are inexpensive (less than $50) and available at many hardware and farm stores. Another great time to check the temperature of the combine's bearings is while you are waiting for the truck or grain cart.

Install an air intake kit. An air intake kit allows clean air found above the combine's "dust cloud" to enter the combine's air intake screen, rather than taking in the dusty, dirt-filled air produced during crop harvesting. Take the time to consider an option that will work best for you and your combine.

Avoid combining during fire danger conditions. Avoid harvesting when it is hot and dry. Relative humidity values are typically low in the fall, which increases the risk of fire, especially during late afternoon hours when temperatures rise. Limit the harvesting of extremely dry soybeans. Soybean moisture can get as low as 8% to 9% on a warm, dry afternoon. Monitor outdoor air temperature and wind speeds. As hard as it is to shut down for the day when conditions are favorable for harvesting, shutting down when temperatures are hot and windy could prevent you from losing your combine to a fire. Be aware and find out if your area is in a fire danger zone by accessing the interactive North Dakota Fire Declarations and Burn Restrictions Map from

Carry two fully charged fire extinguishers. Ideally, you should have two 20-pound ABC fire extinguishers on your combine, one located in the cab and the other on the outside of the machine, near ground level. Have them ready and operational, and review with workers how to use them when needed. Call 911 immediately to get your closest fire department on scene, as fires can escalate quickly.

If you have a water truck, ensure it is full and parked in the field you are combining, in case a fire starts.

Create a soil perimeter. Should a fire start, making a tillage pass around the perimeter of your field can help prevent the spread of fire to other areas.

Strategically park harvest equipment. While harvesting a field, park your semis, trucks, pickups, tractors, grain carts, and other equipment in a location with minimal vegetation. Hot exhaust can be emitted from these vehicles and can start a fire in the ditch if dry grass is present. Before parking equipment and machinery in a shed or quonset for the night, let them cool down first to reduce the risk of a building fire.

"Before going out to combine, let others know your plans and field location," Johnson says. "If you do not return when you say you will, have someone check to make sure you are OK. This also means you should carry a fully charged cellphone with you while you are combining."

Dust and fine crop particles are a natural result of combining. Taking time to clear the chaff and dust helps to remove a potential fuel source for combine fires.

“Even though it may feel like you are slowing down your harvest progress by stopping the machine to clean off chaff and dust, it could be the difference between finishing your harvest season or watching it go up in smoke,” says Johnson. “Do the best you can each day to keep your equipment cleaned and maintained. This will protect your investment and yourself from serious injury.”

For more information on crop harvest fire prevention techniques, visit ndsu.ag/combinefires.

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