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KEEP AN EYE ON CORN STALK INTEGRITY

The warm weather of the past few days has been welcome to help corn reach maturity and finish up small grain harvest. Predicted high temperatures in the 80’s this week and 70’s in the extended forecast make me optimistic that much of the corn will be able to reach black layer (physiological maturity) before we see frost. While that is good news, I encourage farmers and agronomists to scout corn fields for stalk strength issues prior to harvest, especially in areas that have turned dry.

During grain fill, corn prioritizes sending its carbohydrates to the developing kernels. If the plants experience serious stress such as drought, they can remobilize non-structural carbohydrates from stalks and leaves and transport them to the developing ears. Stalks can be physically weakened if the stress is severe and thus become more susceptible to stalk rot diseases, which further compromise the stems. Late season drought stress effects can be exacerbated in fields where there was also early season stress that restricted root growth, such as saturated soils or compaction. With our late, wet spring, there are fields out there that started out wet but are now facing much drier conditions.

Broken stalks are easy to see, but weak stalks are not. To test for weakened stalks, push on stalks at about shoulder level to approximately 30 degrees from vertical, as suggested by Iowa State Extension. If plants fall or pinch over, then stalk integrity issues are present. A tip from Dr. Bob Nielsen at Purdue University is to walk a field perpendicular to the rows and firmly push stalks out of your way as you go. You can also check stalk firmness by pinching the lower internodes to see if they are easily crushed between your fingers. If you find fields with 10% or more of the stalks easily pushed over or internodes that crush when pinched, prioritize them for early harvest to minimize losses from downed corn.

References

Anderson, M. and A. Robertson. 2020. Scout corn fields for stalk rot. Iowa State Univ. Extension. <https://crops.extension.iastate.edu/blog/alison-robertson-meaghan-anderson/scout-corn-fields-stalk-rot>

Nielsen, R.L. 2021. Purdue Univ. Stress during grain fill: a harbinger of stalk health problems. <https://www.agry.purdue.edu/ext/corn/news/timeless/stalkhealth.html>

[Clair Keene](#)

Extension Agronomist Small Grains and Corn

COVER CROPS – SOIL HEALTH FIELD DAY

Opportunities to incorporate cover crops into various cropping systems will be the focus of a North Dakota State University field day Tuesday, September 20. The educational event will focus on cover crop options, establishing alfalfa in an intercrop system, and how cover crops can be used in local farming systems and be beneficial to soil health. Lunch will be provided; however, registration by September 10 is required. Go to <https://tinyurl.com/yn49c3zr> to register online.



The cover crop tour will showcase several cover crop species.

The field day will start with coffee at 9 a.m. at the Hickson research site. To access the site, take I-29 south of Fargo to Kindred Exit 48 then turn east and then turn left (going north) on Highway 81. Drive 0.5 mile and you will see the field day flags.

A second stop will be at the North Dakota Agricultural Experiment Station (NDAES) in Fargo located 0.4 miles west of the corner of 18th Street North and 15th Avenue North or just east of the corner of Dakota Drive and 15th Avenue North. Lunch will be at the Fargo location before the afternoon program, which will end around 3 p.m.

The Hickson research site topics are:

- Corn-alfalfa intercropping and sorghum-alfalfa intercropping
- Sunflower-alfalfa intercropping
- Integrating alfalfa and winter camelina in soybean-wheat-sunflower rotations

The NDAES site topics are:

- Overview of competition in intercropping systems
- Freezing tolerance in winter cover crops
- Intermediate wheatgrass research in North Dakota
- Cover crops in soybean
- Benefits and challenges of cover crops
- Cover crops seeding date trial

Field day participants will have the opportunity to learn about cover crop research findings as well as connect and visit with other participants who have experience in incorporating cover crops into their farming systems. For more information on the field day, visit <https://www.ndsu.ag/op2n8f>.

This field day is part of the outreach effort associated with two National Institute of Food and Agriculture grants from the U.S. Department of Agriculture awarded to North Dakota Agricultural Experiment Station scientists and a North Central Sustainable Agriculture Research and Education – Professional Development grant

Resources:

-Growing Rye as a Cover Crop in North Dakota, publication [A2010](#).

- Winter rye as a preceding cover crop for pinto bean production in North Dakota, Publication [A2050](#).
- NDSU [Cover Crops](#) ag-hub website.
- NDSU [Cover Crops](#) Soil health.

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NOSTALGIA VS REALITY

I have had 3 ½ instances in my career where a person’s memory of the nature of a place substituted for the real name for the place. The first was in my stint in the retail fertilizer business. We had a customer with many farms and one farm was on a main road, and it was distinguished by having a white, wooden corn crib just inside the approach. The directions to the field were ‘turn into the culvert with the white crib’. After a few years, the white crib was torn down and buried, but the approach and the farm remained. To those of us who knew the farm when the white crib was present, it became ‘turn into the approach where the white crib used to be’. This term was confusing to nurse truck operators working for only a season, and with a smile we gave them more specific instructions.

The second was courtesy of my father-in-law who operated a small farm NW of Springfield, IL. It had a small hay field that he invited me to early in my marriage that he intended to hay the weekend we visited. He proudly got out of his pickup and announced that he was going to cut the ‘alfalfa field’ the next day, and bale it soon afterwards. I looked around. There was an alfalfa plant about 6 feet over there, another 10 feet the other direction, and a scattering of alfalfa around the field. To me, it was mostly brome grass with a pinch of alfalfa, but to him, he remembered it 10 years before as an excellent alfalfa stand. To him, it was still the ‘alfalfa field’.

The third was during my ND Soybean Council trip to China several years ago with my colleague Dr. DeSutter. We traveled throughout Heilongjiang Province, in what the Chinese proudly called their ‘Black Soil Region’. I recently came upon the name again while reading a scientific article written by Chinese authors about the region. The area indeed was the black soil region in the early 1950’s when it was converted from long-term native grasses to cropland by plowing mostly by hand (no horses-oxen, really by hand). However, the winds blow strongly from Mongolia over the region certain times each year, and the area likely lost huge amounts of soil into the 1970’s when it appears that the entire province had their field boundaries planted with poplar hedge rows; judging because when we toured in 2014 the trees all appeared to be about the same age. A problem still remains from water erosion, largely caused by continued ‘clean’ tillage, taking off crop residue for home fuel, planting in ridges that tend to direct the water downhill resulting in gullies, and the tendency for farm operators to plant up and down hills rather than across. So the region is probably most aptly named ‘The Brown Soil Region’, however, the region retains its ‘Black Soil’ title.

The one-half instance is about soils in North Dakota, because I hope that the process will reverse itself before it is complete. The North Dakota state motto is ‘Strength from the Soil’, which was altogether appropriate given that the state was covered by 2 to 4 feet of very high organic matter soil when first plowed between 1880 and 1918. Today, most of that topsoil has been lost, but the state motto is still ‘Strength from the Soil’, which is still mostly true. In many fields where no-till is continuously practiced there will be strength from the soil for as long as the practice is maintained. There are many other fields where historical baggage (‘what’s good enough for grandpa is good enough for me’), fear of crop failure, or peer pressure from neighbors and sometimes, surprisingly, landlords hindering a change from major tillage, all

contributing to continued soil loss. In these fields, if the rate of loss continues there will be no strength left in the soil, and yields will become poorer and poorer. Crops will be more susceptible to drought, have more emergence problems, will require more fertilizer and will be less profitable to farm. I have been encouraged, though, lately that more growers have seeded cover crops on prevent-plant acres, and I hope that this will be a step towards more soil-conscious management.

UPDATED NORTH DAKOTA CORN, SUNFLOWER, SPRING WHEAT/DURUM FERTILIZATION PUBLICATIONS AND N-CALCULATOR

In spring of 2022, higher fertilizer costs and higher grain prices were seen that were included in the NDSU fertilizer recommendations at that time. Although the correct N recommendation could have been achieved through division of both grain prices and N costs by a factor of 2, the extra math was cumbersome. Over the spring and summer, the N-Calculators have been updated to include higher grain prices for corn, sunflower and spring wheat/durum and N costs up to \$2 per pound N.

The updated North Dakota Corn Fertility circular SF-722 can be found at:

<https://www.ndsu.edu/agriculture/extension/publications/soil-fertility-recommendations-corn>

The updated North Dakota N Calculator on the web can be found at:

<https://www.ag.ndsu.edu/temp/cnc>

The North Dakota N Calculator contains the N calculator for corn, sunflower and spring wheat/durum. Once a permanent site is established, the updated site will be announced.

The N-Calculator mobile apps for iPhone and Android are being programmed now, but they are not yet ready for release. When they are available, an announcement will be made.

The updated North Dakota Sunflower Fertility circular SF-713 can be found at:

<https://www.ndsu.edu/agriculture/extension/publications/fertilizing-sunflower>

The updated North Dakota Spring Wheat/Durum Fertility circular SF-712 will be posted very soon.

Changes within the recommendations:

The previous N recommendations for corn did not anticipate as many growers growing corn in central North Dakota as there have been lately. Corn in central ND is almost always lower in yield compared to corn in the east due to too much or too little moisture, and the greater severity of soluble salts. Therefore, the category in the East of 'less than 160 bushels per acre' directed central ND farmers towards side-dress, which is important for eastern growers to consider due to leaching/denitrification issues, but not important for central ND corn growers. Therefore, a new region 'Central North Dakota' is presented in the updated recommendations. Also, the 'Langdon Region' now includes corn and sunflower growers, so 'the Langdon Region' is a category in these updated publications not only in spring wheat/durum as before, but also for the corn and sunflower recommendations.

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COLD FALL NIGHTS BRING CREEPY CRAWLERS INTO THE HOME!

As fall night temperatures drop and days get shorter several insects, such as boxelder bugs, multicolored Asian lady beetles, strawberry root weevils and cluster flies, and spiders may invade the home. These creepy crawlers like to overwinter inside the home for warmth, often in the wall voids where temperatures are 40-50F. Unfortunately, they often end up inside the home walking around on floors, walls and ceilings where they become a major nuisance if they occur in large numbers. However, these creepy crawlers are not harmful to people, pets or the house.

The best way to get rid of creepy crawlers inside the home is just vacuuming or physically removing them. To keep them out of the house, figure out where they are getting inside the house, and caulk and seal, repair screens or any entry points to prevent them from coming inside. Many insects only need a small crack like the 'thickness of a credit card' to get inside the home. These creepy crawlers most often find their way into garages, and then into the house if the garage is attached. Place sticky board mousetraps along the floor/wall edges in the garage, basement, and anywhere else you're encountering these creepy crawlers.

Fall invaders often congregate on the sunniest sides of the house - south and west sides. If populations are high, then a perimeter 'barrier' insecticide spray may be useful. Spray 3-5 feet out from the foundation of the house and up the siding of the house, in outdoor entry ways, and inside the garage along the floor/wall interface, especially ground level corners. Examples of insecticides labeled for outdoor use around home are: permethrin, synergized pyrethrins (Spectracide Bug Stop and other brands), pyrethroid insecticides (such as, esfenvalerate - Ortho Home Defense; lambda cyhalothrin – Spectracide; beta-cyfluthrin – Tempo SC Ultra), or carbaryl (Sevin). Please read, understand and follow the label; it's the law.

Once we get a couple of hard freezes, these creepy crawlers will no longer be active outdoors. Thanks goodness!



Left to Right: Boxelder bug and fishing spider (J. Knodel, and P. Beauzay, NDSU Ext. Ent.)

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AROUND THE STATE

NORTH CENTRAL ND

A dry pattern has dominated the scenario in the past two weeks. We had scattered thunderstorms in the area, but not so intense to bring the enough moisture to the soil. Last week the amount of rainfall observed in the region was very close to zero. At the NCREC, 0.12" of rain was observed since last Tuesday (August 30th). The following are precipitation observations across the area as noted by local NDAWN stations from August 30th through September 6th: Bottineau: 0.05"; Garrison: 0.00"; Karlsruhe: 0.00"; Mohall: 0.00"; Plaza: 0.00"; and Rugby: 0.60". Bare soil temperatures were observed at 74°F on the morning of September 6th.

Small grains, canola and flax harvest continue in the region. The dry pattern has shown some stress in some soybeans and corn fields. Flax bolls in some fields were falling down due to the dry conditions as well. Some canola fields were reported with shattering pods due to high temperature and lack of moisture. Some early planted soybeans might be ready for desiccation in a couple weeks. Winter wheat planting is expected to start in the weeks to come, mostly in areas with prevented planting.

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NORTHEAST ND

Small grains harvesting is in full speed, ranging from 40 to 75% completed in several counties. Spring wheat yields ranged from 40 to 80 bu with good test weights and barley yields ranged from 70 to 110 bu. (**Figure 1**)

Field pea harvestings are completed.

Soybeans are turning color in some areas while many fields are still green.

Dry beans are dropping leaves. Pinto beans harvesting has been reported from Walsh County.

Corn development is highly variable across the region. A majority of the fields are at denting stage while some late planted corn fields are still short of 300 GDD to maturity. (**Figure 2**)

Canola is being swathed/combined, while many other fields are turning color. (**Figure3**)

Sunflowers are dropping petals while some are at the late R5 stages.

(Continue for Figures)



Figure 1: A Wheat field nearing harvest and combines taking a break from harvesting in Cavalier County (Anitha Chirumamilla, Extension Cropping Systems Specialist, LREC)



Figure 2: Corn at denting stage in Ramsey County (Anitha Chirumamilla, Extension Cropping Systems Specialist, LREC)



Figure 3: Canola field ready for harvesting (Anitha Chirumamilla, Extension Cropping Systems Specialist, LREC)

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NORTHWEST ND

The northwest corner of the state has experienced mostly hot and dry weather conditions during the past two weeks. Most areas are dry. Some areas are fortunate to have received sporadic rain. According to NDAWN weather data, the towns of Alamo, Fortuna, Grenora, and Noonan received 1.43, 0.58, 0.76, and 0.43 inches of rainfall, respectively, on August 26th, and two days later, the town of Bowbells received 0.91-inch rain. However, hot daytime weather conditions followed suit with temperatures recorded up to the upper 90s. The hot and dry weather conditions probably did not help crops such as soybean, sunflower, and corn in dryland farming situations. I've seen fields of soybean and corn showing moisture and heat stress due to the hot temperatures and lack of rainfall in the past two weeks. However, the same weather condition has helped the drying down of crops such as canola, chickpeas, lentils, flax, small grains, and peas in preparation for combine harvesting.

Crop harvesting is the theme across the northwest counties. Harvesting activities are in full swing in McKenzie, Williams, and Mountrail counties. Harvesting of crops in Divide and Burke counties is expected to ramp up in the coming days. Most of the spring small grains have been harvested. At the WREC dryland farm, oat and barley yields have been running in the 40-bushel range. The low yield response was attributed mostly to grasshopper damage and shelling by the wind. Harvesting of flax, peas, chickpeas, and lentils continues across the counties. Safflowers are mature and will be ready for combine harvesting in a few days. Harvesting of canola in this corner of the state is starting to gain momentum as well. Corn fields are at R3 to R5 stage, soybeans are at R5 to R7, and most sunflowers are at R6 to R8. Grasshoppers still continue to cause damage to crops (**Figure 1**), although infestation levels vary from one field to another. Goss's wilt has been observed in irrigated corn mostly found in field edges. Charcoal rot also has been observed in soybean fields (**Figure 2**).

(Continue for Figures)

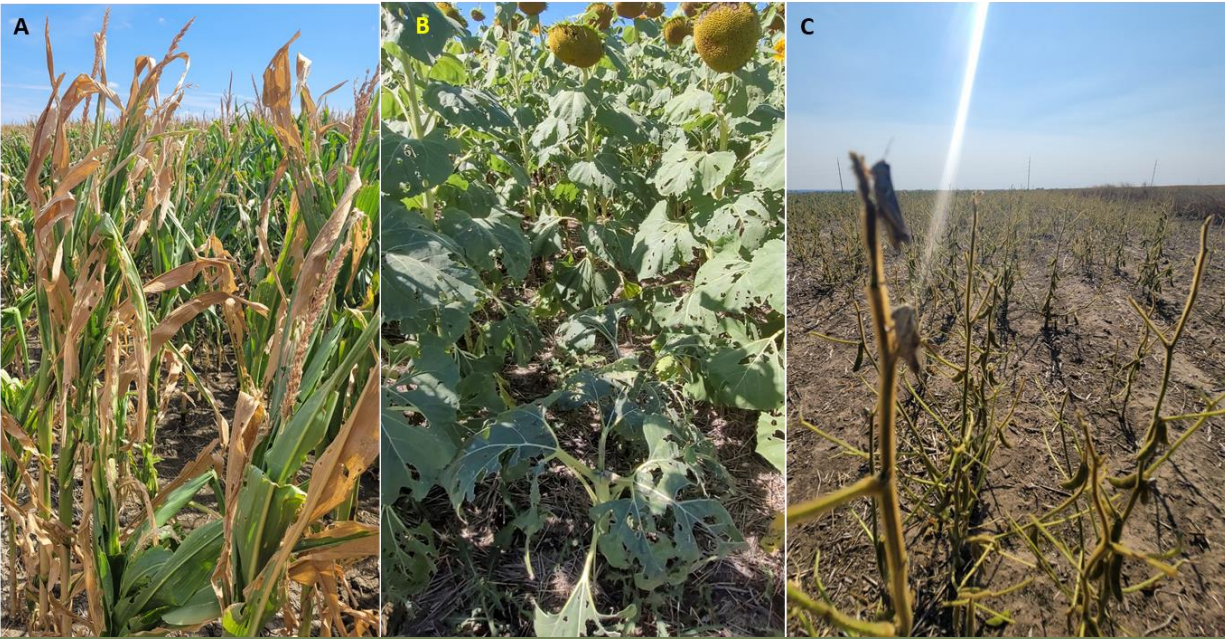


Figure 1. Advanced stage of Goss's wilt disease and grasshopper damage in irrigated corn (A), grasshopper damage in sunflower (B), and a soybean strip showing severe grasshopper damage at the edge of a soybean field (C). Pictures taken in Williams county.



Figure 2. A soybean field showing symptoms of Charcoal rot disease. Soybean plants are wilted and are dying off, with leaves still attached (A) and the lower stem of infected plants appear silver-gray (B). Pictures taken in Mountrail county.

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SOUTH-CENTRAL/SOUTHEAST ND

The region's landscape colors are transitioning from green to brown, due to crop maturity and harvest, and dry weather. In general, our brown landscape is resulting from small grain harvest, drought-stressed crops and dry pastures. Yellow-brown crops include dry bean, and timely planted and early maturing soybean. Green color remaining is due to long-maturity or June-planted soybean; corn, sunflower and hayland.

According to NDAWN, the region received 1.4 inches (Courtenay; Stutsman County) to 4.4 inches (Fingal; Barnes County) during July 1 to September 5. During this period, the Carrington REC received 2.7 inches and Oakes research site received 3.6 inches. The region's average daily water use by corn and soybean (plant emergence on May 31) was 0.2 inch during Aug. 30-Sept. 5.

The majority of the region's small grain acres have been harvested. Corn generally ranges from dough to dent (R4-5) stages. A September free of a killing frost is generally needed for corn to reach black layer. Soybean are in the late-seed development to initial maturity (R6-7) stages. Many fields are showing color change. Most dry bean are nearing or are at seed maturity; harvest will soon be commencing. Sunflower are in the mid- to late-seed development (R7-8) stages.

With soybean and other row crop canopies opening up, this is a good time for monitoring fields for pigweeds, kochia, common ragweed and other troublesome weeds (**Figure 1**).



Figure 1. Waterhemp visible above soybean canopy.

The Carrington REC conducted a **row crop field tour** on Thursday, September 1 (**Figure 2**). Farmers and crop advisers not able to attend this educational event can request an electronic copy of the tour booklet by contacting the Center. Information includes the following production research and recommendation summaries:

- Corn - starter fertilizer

- Dry bean - plant population X row spacing; winter rye as a preceding cover crop; white mold management
- Soybean - winter rye planting dates and rates as a preceding cover crop; white mold management
- Sunflower - sclerotinia head rot management; blackbird feeding reduction tools.



Figure 2. Nick Paulsrud, Central crop consultant, providing participants with a corn update.

[Greg Endres](#)

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SOUTHWEST ND

Earlier this summer we were concerned about disease pressure from all of the moisture we were receiving, however the second half of the growing season has been on the dry side for a majority of the region. According to NDAWN, from August 1st to September 5th Dickinson received 0.43 inch of rain, Mott received 0.73 inch, Hettinger received 0.39, Bowman 0.42, Amidon 0.56, Beach 0.58, Hazen 1.05, Mandan 1.85, and Carson with 0.34. The drier weather has helped with dry down for small grains and hay harvest, however it has not been ideal for row crops like corn and soybeans.

Many sunflower fields have been looking great across the region. Insects, mainly grasshoppers, continue to be a concern. Lately there has been a haze in the air from distant fires out west. Dry conditions have reminded many of the need to check fire extinguishers on harvest equipment, both in the cab and one that can be accessed from the ground. For more information check out the Crop Harvest Fire Prevention Checklist publication at <https://www.ag.ndsu.edu/publications/crops/crop-harvest-fire-prevention-checklist>

Harvested yields for small grains and canola have had a wide range depending on environmental stressors, planting date, and management, but for the most part things have been good. A common issue has been high amounts of green foxtail within small grain fields. A common thread has been barnyard grass and green foxtail thriving in low pH areas of fields and foxtail barley moving in especially where there is salinity (**Figure 1**). Along with these grassy weeds, Russian thistle, lambsquarters, redroot pigweed, and kochia have been holding on strong this year. In low soil pH situations, we have some preliminary yield data from a project funded by the ND Wheat Commission. In the trial we planted an

Aluminum toxicity tolerant and a susceptible variety and added a few different fertilizer treatments within the varieties. The tolerant variety (Lanning) yielded 65 bushels/acre and the susceptible variety (Soren) yielded 47.5 bushels/acre. Variety selection is our most economical short-term tool for these low pH situations, ideally we would apply tons of lime to fix this situation, if lime application is not feasible at the moment then choosing the right variety for the situation can make a large difference. Another short-term option that showed a statistical difference was 60lbs of actual P as triple super phosphate applied with the seed--on top of a regular P application--yielded 61 bushels/acre and the control with no extra P applied with the seed yielding 52 bushels/acre. We tried applying lime, gypsum, or calcium nitrate with the seed and these additions did not result in differences in yield from the control. Lime needs to be applied in tons/acre to have an effect over time on soil pH, a smaller rate with the seed hasn't shown a yield difference in small grains over 2 years of trials. Lime--also known as calcium carbonate--is a great calcium source, however the carbonate is what really helps us with low pH soil, and calcium products alone are not very helpful in acidic situations, especially at rates below 200 lbs/acre. Without fixing the issue with a high rate of lime we may be able to make up yield with band-aid management, but we are not using our nutrients efficiently, our herbicides may not act the way they are supposed to, and our soil biome is not functioning well.

Early maturing soybean varieties in the region are starting to turn (**Figure 2**). No-till practices have alleviated some of the moisture stress.



Figure 1. Wheat field in Hettinger County with green and yellow foxtail poking through the stand.



Figure 2. Early maturity soybean varieties like ND17009GT are beginning to turn. There hasn't been much for moisture but with a mixture of no-till practices preserving the early season moisture and some moisture from heavy dew in late summer the soybean crop is looking better than expected for the conditions we've had.

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