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entomology

SCOUT FOR DIAMONDBACK MOTH IN CANOLA

Diamondback moth adults and larvae have been observed at economic population levels in northeastern ND canola. The severity of diamondback moth infestations depends on the overwintering population in the southern states and how many moths migrate into North Dakota. The level of feeding injury varies greatly and depends on larval densities and plant growth stage. Larvae feed on the leaves, buds, flowers, seed pods, the green outer layer of the stems and, occasionally, on the developing seeds.

The adult diamondback moth is a small, gray or brown moth about ½ inch long. When the wings are folded, three cream diamond-shaped markings are present, hence the name diamondback moth. Mature larvae are green and about ½ inch long and spin a strand of silk when disturbed.

Diamondback moth larvae can be monitored in the field by pulling all plants from a 1-square-foot area and then beating the collected plants onto a clean surface or into a white bucket and subsequently counting the number of larvae dislodged from plants. Larvae often will dangle from canola plants on a silk thread. Repeat this procedure in at least five locations in the field to obtain an average number of larvae per square foot. The best pest management practices for profitable yields while preventing losses from diamondback moth on canola include early monitoring of adults and larvae, and insecticide treatment only if necessary.



Diamondback moth adult (W. Cranshaw, Bugwood.org)



Diamondback moth larva and leaf feeding (A. Chirumamilla, Cavalier County Ext. office)

Economic Threshold for Diamondback Moth in Canola
Flowering stage – 10 to 15 larvae per square foot
Pod stage – 20 to 30 larvae per square foot

ADULT CORN ROOTWORMS TRAP UPDATE

Adult corn rootworms continue to emerge at low numbers, based on yellow sticky trapping. Based on total counts, 71% of collected rootworms were northern corn rootworm (NCR) adults and 29% were western corn rootworm (WCR) adults. NCRs were observed last week in corn fields near Casselton, Cass County, Shenford and Sheldon in Ransom County, and Colfax and Antelope in Richland County. WCRs were observed near Sheldon in Ransom County and Colfax in Richland County. Other counties scouted last week that had no corn rootworms were Barnes, Griggs, Steele, Trail, and Grand Forks.

All fields were below the economic threshold (E.T.) of ≥ 2 beetles per trap per day (or ≥ 56 beetles per 4 traps per week as shown in Table 1). If above E.T., a high corn

rootworm population is expected the following year and a corn rootworm management tool will likely be necessary to protect the following year's corn crop.

Table 1. Adult corn rootworms (northern and western corn rootworms) per 4 traps per week in ND field corn, 2021.

Area	County	Nearest town	July 16-22	July 23-29
EC	Barnes	Cuba	0	0
EC	Cass	Casselton	4	5
EC	Cass	Kindred	0	0
EC	Griggs	Cooperstown	0	0
EC	Steele	Finley	0	0
EC	Traill	Alton	0	0
NE	Grand Forks	Gilby/Mcanna	0	0
NE	Nelson	Lakota	0	0
SE	Ransom	Shenford	1	1
SE	Ransom	Sheldon	0	4
SE	Richland	Colfax	1	3
SE	Richland	Antelope	0	1
Total # of corn rootworms =			6	14
Percentage of NCR =			83%	71%
Percentage of WCR =			17%	29%

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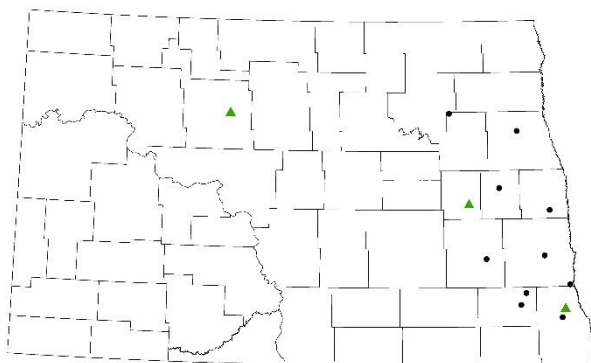
Extension Entomologist

EUROPEAN CORN BORER CONTINUES TO DECLINE

European corn borer (ECB) moths continue to decline. ECB Z-race moths (univoltine) were detected at 9 of the 13 of trap sites and ECB E-race (bivoltine) at 3 of the 13 trap sites last week (Table 1 on page 3). The ECB-Z and ECB-E-race moths peaked the week of July 2-8. The ECB-Z moths were 96% of the total trap catch last week, while ECB-E moths were only 4%. Corn crop stages were VT to R2.

European Corn Borer Trapping New York (or E-race)

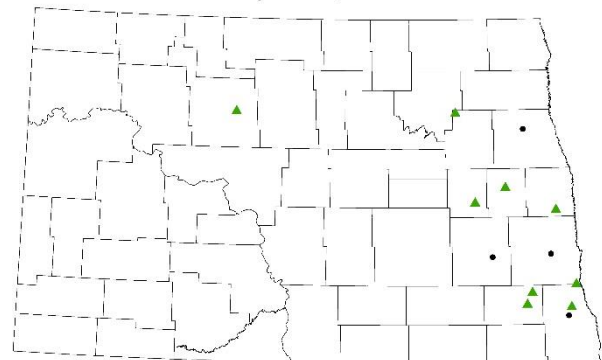
July 26 - 30, 2021



Total number of moths per trap per corn field
 • 0 ▲ 0.1-5 ● 5.1-10 ■ > 10

European Corn Borer Trapping Iowa (or Z-race)

July 26 - 30, 2021



Total number of moths per trap per corn field
 • 0 ▲ 0.1-50 ● 50.1-100 ■ 100.1-200 ▲ > 200



Table 1. Summary of pheromone trap catches for European corn borer in ND field corn, 2021.

Area	County	Nearest town	Race	June 18-24	June 25-July 1	July 2-8	July 9-15	July 16-22	July 23-29
EC	Barnes	Cuba	Z	0	0	0	0	0	0
EC	Barnes	Cuba	E	0	0	0	0	0	0
EC	Cass	Casselton	Z	0	0	0	0	4	0
EC	Cass	Casselton	E	0	0	1	0	0	0
EC	Cass	Kindred	Z	0	0	6	5	4	1
EC	Cass	Kindred	E	0	0	0	1	0	0
EC	Griggs	Cooperstown	Z	0	1	1	0	1	1
EC	Griggs	Cooperstown	E	0	0	0	0	0	1
EC	Steele	Finley	Z	0	0	25	8	3	11
EC	Steele	Finley	E	0	0	0	0	1	0
EC	Traill	Alton	Z	0	0	49	1	14	14
EC	Traill	Alton	E	0	0	1	0	1	0
NC	Ward	Minot	Z	1	1	0	1	0	1
NC	Ward	Minot	E	0	1	1	1	1	1
NE	Grand Forks	Gilby/Mcanna	Z	0	1	9	0	2	0
NE	Grand Forks	Gilby/Mcanna	E	0	0	0	0	0	0
NE	Nelson	Lakota	Z	0	8	31	22	38	10
NE	Nelson	Lakota	E	0	0	0	0	0	0
SE	Ransom	Shenford	Z	28	106	121	65	9	22
SE	Ransom	Shenford	E	0	0	8	1	0	0
SE	Ransom	Sheldon	Z	3	30	10	25	17	13
SE	Ransom	Sheldon	E	0	0	1	0	0	0
SE	Richland	Colfax	Z	0	1	5	8	0	3
SE	Richland	Colfax	E	0	0	0	0	0	1
SE	Richland	Antelope	Z	0	0	2	2	0	0
SE	Richland	Antelope	E	0	0	0	0	0	0
			Total # of Z =	32	148	259	137	92	76
			Total # of E =	0	1	12	3	3	3

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IPM CROP SURVEY - INSECT UPDATE

Soybean aphid numbers continue to be low and were observed in about 19% of the soybean fields scouted last week, mainly in the eastern half of ND and central to northwestern MN. The percent of plants infested ranged from 3-42% with an average of 1-5 aphids per plant among the positive observations, and located mainly in eastern ND. All soybean fields were below the economic threshold (average of 250 aphids per plant and 80% incidence). Growth stages of soybeans ranged from R3 (beginning pod) to R5 (beginning seed). See maps on NDSU's IPM website:

<https://www.ag.ndsu.edu/ndipm/images/soybeans/2021/7-19-7.30/aphidincidence.jpg>

<https://www.ag.ndsu.edu/ndipm/images/soybeans/2021/7-19-7.30/aphidnumber.jpg>

Spider mites increased slightly and were mainly present on field edges in about 14.5% of soybean fields surveyed last week, compared to only 3% last week. Field edge sprayings for spider mites in SE ND have been reported. See map on IPM website: <https://www.ag.ndsu.edu/ndipm/images/soybeans/2021/7-19-7.30/mitesedge.jpg>

Adult grasshoppers were detected in 89% of all the IPM fields (wheat, barley, soybean, sunflower) scouted last week and about 22% were at the economic threshold of ≥ 8 -14 adult grasshoppers per square yard in the field. Here's some of the photographs of the 2021 severe crop damage caused by adult grasshoppers. Thank you for sending them!

Frequent scouting is the key to early detection and timely pest management.



Adult grasshoppers defoliating soybeans on field edge, Griggs County (J. Stachler, Griggs Co. Ext. office)



Adult grasshopper chewing on tip of corn ear and silks (V. Calles-Torrez)



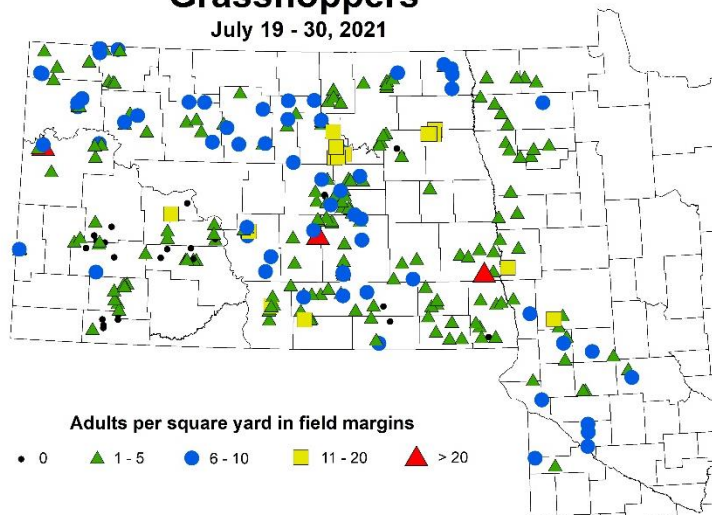
Adult grasshoppers feeding on sunflower heads, west of New Leipzig, ND (I. Dukart, IPM Scout)



Adult grasshoppers clipping heads of wheat near Sawyer, ND (T. Duchsherer)

Grasshoppers

July 19 - 30, 2021



CONTINUE TO SCOUT FOR SUNFLOWER INSECTS

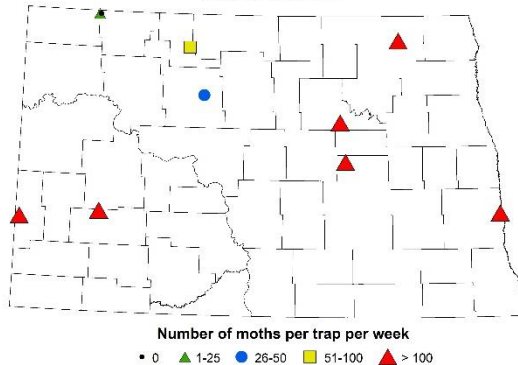
Sunflower crop stages were in the R1 (terminal bud) to R5.7 (70% flowered) stages last week in scouted IPM fields or in fields with IPM traps.

Trap captures for **BANDED SUNFLOWER MOTH AND ARTHURI SUNFLOWER MOTH continued to increase** for the third week in a row from a total of 973 moths two week ago to 1422 moths last week. The highest trap numbers of banded sunflower moths (>100 moths per trap per week) were located at trap sites in Cass, Foster, Benson, Cavalier, Golden Valley and Stark counties (see map).

Banded Sunflower Moth Trapping Network

Cochylis hospes

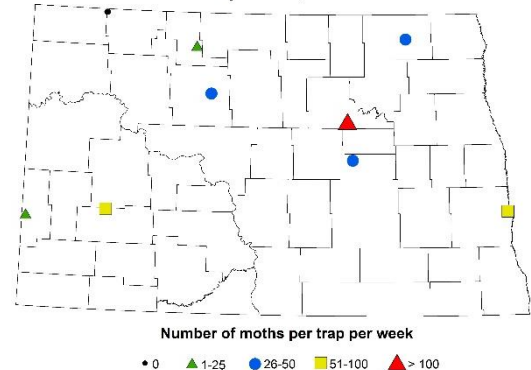
July 26 - 30, 2021



Arthuri Sunflower Moth Trapping Network

Cochylis Arthuri

July 26 - 30, 2021



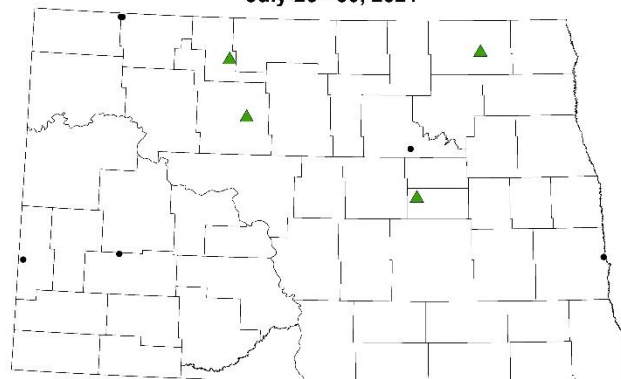
Two to six **SUNFLOWER MOTHS** per trap per week (non-economic) were captured at Foster, Ward, Renville and Cavalier counties trap sites this past week. These low numbers are below the **Economic Threshold (E.T.) of 28 sunflower moths per trap per week. If traps catches are less than 7 moths per trap per week, the infestation is considered non-economic. For field scouting, 1 to 2 moths per 5 plants is necessary for an insecticide treatment.**

Look for sunflower moth when scouting for other moths and red sunflower seed weevils. This $\frac{5}{8}$ inches long, grayish-tan moth migrates into ND sunflower fields during bloom. Eggs are laid on the face of the early flowering fields. Eggs hatch in 48 to 72 hours into larvae. Mature larvae are about $\frac{3}{4}$ of an inch long and have light longitudinal stripes on a brown body. Larvae cause feeding injury to the sunflower head by tunneling through immature seeds and the back of the head. Insecticide should be applied in early flowering (R5.1 - R5.3) when above the E.T.

Sunflower Moth Trapping Network

Homoeosoma electellum

July 26 - 30, 2021



Red Indicates Economic threshold level in trap during R3-R5

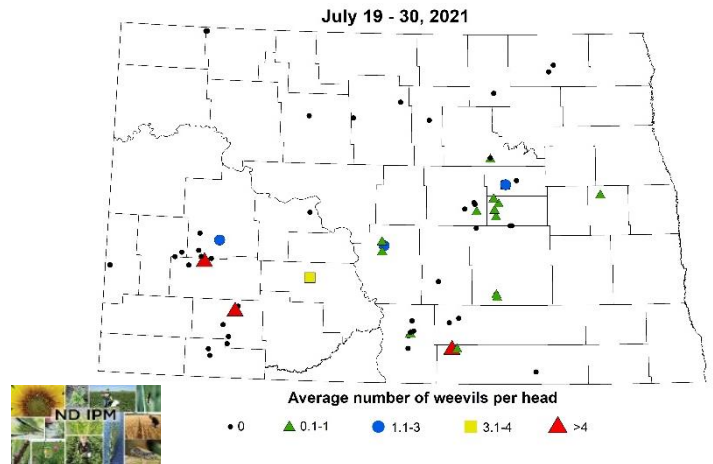


Sunflower moth adult (top, P. Beauzay) and larva (bottom, J. Knodel)

RED SUNFLOWER SEED WEEVILS were detected at 45% of the sunflower fields scouted last week, but only 12.5% were at the economic threshold of ≥ 3 -4 weevils per head. Continue to scout for weevils until sunflowers are past the susceptible crop stage, R5.7 (70% flowered).

See last week's [Crop and Pest Report #15, July 29, 2021](#) for scouting and E.T. of the red sunflower seed weevil.

Red Sunflower Seed Weevils in Sunflower



ARMYWORM AND BLACK CUTWORM TRAPPING NETWORK

Trap catches for true armyworm and black cutworm continue to decline as wheat matures and is harvested. True armyworms were detected at 30% of the trap sites and declined in half (total of 16 moths captured last week compared to 31 moths captured during the previous week). Black cutworms were detected at 25% of the trap sites with low numbers of moths captured, a total of 10 moths last week. Maps are available at:

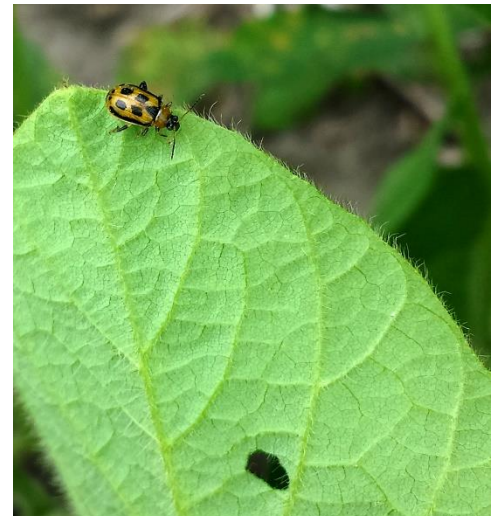
<https://www.ag.ndsu.edu/ndipm/wheat-insect-trap>

SCOUT FOR BEAN LEAF BEETLES IN SOYBEANS

Increasing numbers of bean leaf beetles (BLB) have been observed recently in southeastern ND, especially south and west of Wahpeton. Adults are yellow-green to reddish-brown and have four black spots (or no spots) with a black border on wing covers. The black triangle at the top of wing covers is always visible and used to identify this beetle.

The new generation of BLB adults are emerging (August) and feeding on foliage and pods. Feeding injury to leaves appears as small round holes between the leaf veins. Injury to pods appears as lesions similar in size and shape to leaf-feeding holes. This late season BLB feeding on the foliage and pods is more important than early season feeding of the overwintering adults. Late feeding may increase the risk of pod clipping, virus transmissions and secondary infections (rotting and discoloration) from fungi and bacteria. Although bean leaf beetle can vector viruses like bean pod mottled virus (BPMV), this had not yet been recorded in ND.

Bean leaf beetles are fast-moving so sweep nets are a good tool to detect beetles hiding in the soybean canopy. Treatment thresholds are based on either defoliation or number of beetles per plant.

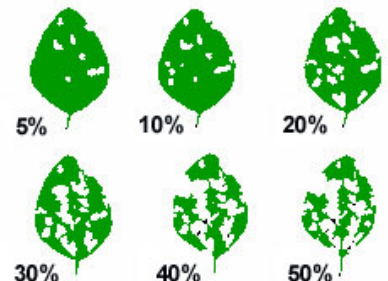


Bean leaf beetle adult
(T. Senger, former IPM scout)

Economic Threshold for Bean Leaf Beetle in Soybeans

Defoliation: Flowering to pod fill stage - 20% defoliation
or 10% pod feeding (or presence of clipped pods)

Number of beetles per plant: 0.5 beetle/plant during pod set to fill



COCOONS OF PARASITIC WASPS

These cocoons are 'good' beneficial insects or parasitic wasps in the insect family Braconidae. These tiny parasitic wasps (or parasitoids) lay multiple eggs within foliage-feeding caterpillars, such as armyworms or loopers. Eggs hatch into larvae, and they eat the insides of the caterpillar, thus killing it. Parasitism by the braconid wasps often causes the caterpillar to crawl to the tip of the plant, and it turns it into a zombie. Each mature larva of the wasp emerges and then spins a cocoon outside the caterpillar body. Extension Entomology has received many calls/emails/texts about these Braconid cocoons and whether it is a friend or foe on field crops. It is being observed on wheat/barley awns and on soybean leaves.



Cocoons of Braconid parasitic wasp found south of Dunn Center (M. Schollmeyer, grower)

[Janet J. Knodel](#)

Extension Entomologist



MANAGING CERCOSPORA LEAF SPOT OF SUGARBEET

Cercospora leaf spot (CLS) (Figures 1 and 2) is the most damaging foliar disease of sugarbeet in North Dakota, Minnesota, Michigan and Montana. The causal agent of CLS is the fungus *Cercospora beticola* which is most damaging in warm weather (day temperature of 77 to 90° F and night temperature above 60° F) and in the presence of moisture from rain or dew on the leaves for 8 or more hours. The fungus destroys the leaves and thus adversely affects photosynthesis. The longer and more severe the infestation, the greater the reduction in root yield, sugar concentration and recoverable sucrose. Higher impurities in roots of infected plants results in higher processing costs and reduces the throughput of the factory.

Growers typically manage CLS by integrating rotation with non-hosts crops including corn, soybean and wheat, planting CLS tolerant varieties, incorporating infected debris through tillage, planting away from a previously infected crop, and timely application of fungicide mixtures.

Growers should check with their respective cooperatives for recommendations made for specific factory districts.



Figure 1. *Cercospora* leaf spot damage on older leaves of sugarbeet plants as lesions coalesce.



Figure 2. *Cercospora beticola* kills the mature and productive leaves resulting in re-growth of new leaves. Severe disease starting in early summer results in reduced tonnage, significantly lower sugar content with higher sugar loss to molasses resulting in lower recoverable sucrose.

The best way to control CLS during the growing season is to apply effective fungicide mixtures in a timely manner. For ground application, apply fungicides in 15 to 20 gallons of water per acre at 60 to 100 psi pressure; aerial applicators should use 3 to 5 gallons of water per acre. Since *C. beticola* has developed resistance to multiple fungicides, and most individual fungicides have become less efficacious, all applications should be a mixture with different modes of action.

In field research trials, the use of triphenyltin hydroxide (TPTH) in a mixture with either an EBDC (such as Mancozeb/Penncozeb/Dithane) or copper (such as Badge/Champ/Cuprofix) in an alternation program with a triazole (such as Proline/Minerva/Inspire XT/Provysol) in a mixture with either an EBDC or copper provided good to excellent control of CLS (Figure 3) - in years when the fungicides were not washed off by heavy rainfall after applications. Another strategy



Figure 3. Picture of four inner rows of sugarbeet plot treated with fungicide mixtures in a rotation program: Topsin + TPTH / Inspire XT + Badge SC / Mankocide / Minerva Duo + Badge SC.



Figure 4. Picture of four inner rows of sugarbeet plot treated with multi-site fungicide mixtures in a rotation program in 2018: TPTH+EBDC / Mankocide / TPTH+Badge / Mankocide

that will work will be using mixtures of TPTH, copper products and EBDC fungicides in a rotation program at 14-day intervals during dry conditions (Figure 4) and 10 to 12 day intervals when there is more rainfall.

The availability of new and improved CLS varieties (CR) in some factory districts will be useful in managing CLS. In field trials, it was observed that new CR varieties, even in the absence of fungicides, were least affected by CLS and yields were significantly higher than CLS susceptible varieties that were sprayed multiple times (4 to 6) during the wet 2020 growing season (Figure 5) that was favorable for disease development.

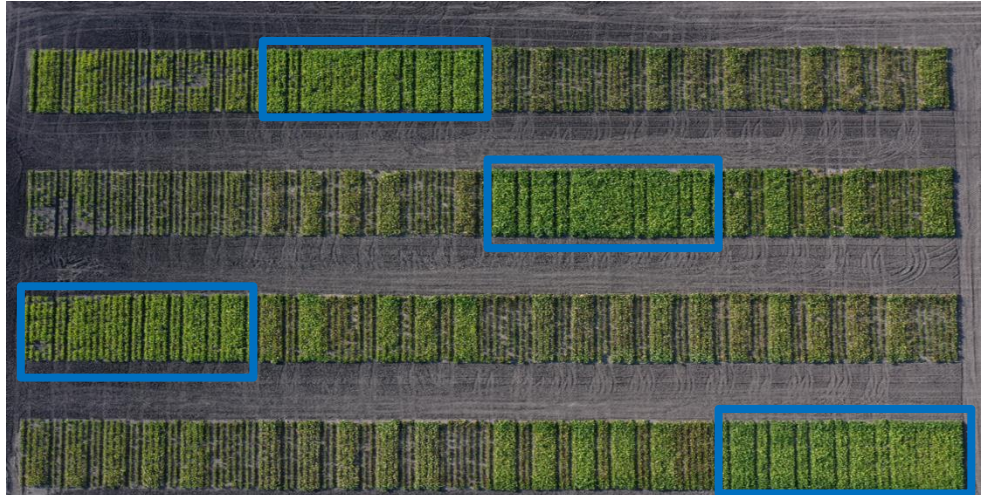


Figure 5. Improved CLS resistant variety (green with blue boxes) produced higher tonnage, sugar content and recoverable sucrose than susceptible varieties when conditions were very favorable for the development of CLS in 2020 in field trials near Foxhome, MN.

[Mohamed Khan](#)

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FERTILIZER VALUE OF DISTRESSED CORN HARVEST FOR FORAGE

Last week, the fertilizer value of spring wheat and barley straw was estimated. This week, the subject is corn harvested for forage. There are at least three possible harvest methods:

- whole plants cut close to the soil surface before or at tassel, or harvested after silking because pollination was very poor
- whole plants as silage, including some grain
- 'Stalklage' that passes through the combine at harvest. This does not include any grain, nor is it usually cut close to the soil surface. Whatever passes through the combine.

Whole plants cut at tasseling (VT)

Several years ago, I participated in a multi-state project in which we cut whole plants at early tassel. The percentage of N in this sampling would be a good estimate of what a corn grower should expect, although they would

have to estimate their dry matter weight. The P and K are estimated from the proportion of corn uptake at tassel compared to total seasonal uptake.

Percent N 1.7%
Percent P_2O_5 0.46%
Percent K_2O 1.5%

For each ton of dry matter of whole plants at tassel, the N would be 34 pounds per ton, P_2O_5 would be about 9 pounds per ton and the K_2O would be 30 pounds per ton.

Corn silage nutrient removal

Although the grain in corn silage this year will likely be much reduced compared to a more normal growing season, the N, P and K content would be expected to be similar to tonnage including grain. The nitrate in this silage would also be expected to be much greater, since it did not move to grain and was not converted to protein. The following values assume 65% moisture in the silage.

Percent N 0.63%
Percent P_2O_5 0.28%
Percent K_2O 0.35%

For each ton of silage (at 65% moisture), there would be 13 pounds per ton N, 5.6 pounds P_2O_5 per ton and 7 pounds of K_2O per ton.

Nutrient content from what comes out the combine

What comes out of the combine is neither whole plants nor is it silage. A combine usually cuts higher from the soil surface than a silage chopper, and it does not contain any grain. Also, the corn has grown to maturity, and therefore has different nutrient concentration than plants cut at tassel. It contains cob material, and some fines are lost to the soil surface. These figures come from my 1975-76 MS work at the University of Illinois. Every once in a while, I get a chance to share these values to someone's advantage.

Stalklage N, P and K concentrations-

Percent N 0.45%
Percent P_2O_5 0.11%
Percent K_2O 0.8%

For each ton of stalklage dry matter, there would be 9 pounds N per ton, 2.2 pounds P_2O_5 and 19 pounds of K_2O . Fertilizer values will vary and fertilizer prices, like grain prices, are volatile at this time.

Generally, present costs are about:

N 40 cents per pound
 P_2O_5 66 cents per pound
 K_2O 53 cents per pound (as KCl)

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CONTROLLING BROADLEAF WEEDS IN SMALL GRAINS STUBBLE

Small grain harvest is underway in eastern North Dakota and western Minnesota. Some small grain fields have broadleaf and grass weed escapes; weeds coexisting with small grains due to dry conditions affecting small grain growth and development (Image 1). Small grains did not out compete broadleaf weeds in 2021.

We suggest you WAIT to till fields following wheat harvest. Dry soils will make tillage much more difficult as compared to tillage after a rainfall event. Moreover, insects and rodents forage on crop and weed seeds, which are a source for their energy. University research reports greater than 5% per day loss of weed seeds, and total losses ranging between 20% to 90%, when weed seeds remain on the soil surface. Tillage after harvest greatly reduces predation of weed seeds since predators prefer not to dig for seeds.

We suggest waiting ten to fourteen days to till after harvest, or until waterhemp or kochia is approximately 4-inch tall (Image 2). We know that glyphosate alone does not provide control of glyphosate resistant waterhemp or kochia. Field research to evaluate waterhemp control from mixtures with glyphosate was conducted in August and September 2020 in wheat stubble (Peters TJ and Lystad AL. 2021. Waterhemp control in small grains stubble. Sugarbeet Res. and Ext. Rep.51:38-39). (<https://www.sbreb.org/wp-content/uploads/2021/04/2020-full-book.pdf>).

We observed 90% waterhemp control from Roundup PowerMax at 32 fl oz/A plus Sharpen (saflufenacil) at 1 fl oz/A with Prefer 90 NIS at 0.25 % v/v plus N-Pak AMS at 2.5% v/v, 6 days after treatment (DAT). At 22 DAT, there was no statistical difference between Roundup mixtures with Sharpen or Roundup and 2,4-D at 64 fl oz/A with Prefer 90 NIS at 0.25 % v/v plus N-Pak AMS at 2.5% v/v. Please be aware of crop rotation restrictions! Sharpen has a 4-month crop rotation restriction between application and sugarbeet planting; total months when soils are unfrozen. Sharpen is degraded in soil by microbes.

Soil moisture, especially in the surface layer, is lacking in 2021 due to our drought conditions. Thus, it is not clear how much microbial activity might be occurring in soils. We believe Sharpen for fall broadleaf control might be a risky proposition, especially in fields to be planted to sunflower, drybean, sugarbeet, and potato in the spring of 2022. Therefore, Roundup PowerMax plus 2,4-D probably is a better option for waterhemp and kochia control following wheat harvest.



Image 1. Waterhemp, kochia and common lambsquarters escapes in wheat, Cass County, ND



Image 2. Waterhemp regrowth after wheat harvest, Cass County, ND

Gramoxone (paraquat) was not an entry in the 2020 experiment but may be an alternative to programs with crop rotation restrictions. Apply Gramoxone SL at 1.3 pt/A (3 lb gallon formulation) or 2 pt/A (2 lb gallon formulation) with non-ionic surfactant at 2 pt per acre in at least 15 gpa water carrier when broadleaf weeds are less than 4- to 6-inches tall. We observed improved control of broadleaves greater than 6-inches tall when 2,4-D is mixed with paraquat. We have also observed improved control from early evening application as there is some paraquat translocation in plants from late afternoon applications. Finally, please be respectful of neighbors' sensitive crops especially when conditions are breezy.

[Tom Peters](#)

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HORNET SEASON IS HERE EARLY!

Hornets (or yellowjackets) belong to the family Vespidae. All yellowjackets sting and their stinging behavior is considered a defensive reaction when the colony is threatened. They can sting more than once because their stinger stays with the insect unlike with the honey bee. Yellowjackets are more aggressive during August and September and more likely to sting people. Although yellowjackets are actually a beneficial insect feeding on other insects, they often become a pest problem when nests are located near homes, schools, picnic areas, or playgrounds. Pest control is often warranted.

Biology: These wasps are social insects and build nests of paper-like material. Nests generally are located underground in mammal burrows, cavities or in between house siding. In the northern temperate climates, only the mated queen wasp overwinters from the previous year's colony. Queens are inactive during the winter, hiding in protected places like under tree bark or attics. In early spring, the overwintering queen builds a new nest and lays an egg in each cell. Larvae hatch from the eggs and are dependent on the queen for food. The queen forages outside the nest and brings food (caterpillars and other insects) back to the larvae until pupation. Sterile female workers emerge from the pupae and take over nest building and brood rearing, while the queen stays in the nest. During late summer into early fall, adult males and newly produced queens leave their parent colony. The colony dies off, and only newly mated queens will find a protected place to overwinter.

Control: Vespid wasps are active outside the nest during the daylight hours. Nearly the entire colony is in the nest during the evening and night-time hours, so control measures should be applied to the nest then. There are many insecticides labeled for control of hornets and yellowjackets. The difficulty is making the treatment without being stung. Usually, an aerosol spray of one of the many fast-acting wasp killers will quickly kill all workers present in the nest. Examples of fast-acting products are permethrin, synergized pyrethrins (Spectracide Bug Stop and other brands) or pyrethroid insecticides (such as, esfenvalerate - Ortho Bug-B-Gon Garden & Landscapae Insect Killer; lambda cyhalothrin - Spectracide). A slower-acting insecticidal approach is to apply carbaryl (Sevin) dust directly onto the exposed nest and entrance hole. After treatment, check the nest for any activity the following day and re-treat if necessary. Nests should be removed to avoid attracting dermestid beetles at some later time and to keep wasp pupae from possibly reestablishing the nest. Yellowjacket nests can become an important source of carpet and other dermestid beetle infestations in the home. If dealing with yellowjacket nests in structures like homes, the nest entrance should never be plugged from the outside. If constrained, yellowjacket workers cannot escape to the outside, and they may locate or



chew a new way to escape toward the inside of the home or structure, creating a possible stinging threat for people inside., so the nest should be removed whenever possible. When outside enjoying your picnic, avoid wearing bright colors and perfumes which are attractive to hornets and yellowjackets, and keep garbage away from the picnic table.

[Updated article written by J. Knodel from a past Crop & Pest Report.]

[Janet J. Knodel](#)

Extension Entomologist

around the state

AROUND THE STATE

NORTH CENTRAL ND

A dry pattern returned to the region over the last week. No rainfall was registered at any of the area NDAWN stations during the week of July 26th. Bare soil temperature at the NCREC is observed at 82 degrees F.

Grasshoppers continue to be observed, with localized spots of higher populations being noted. In some localized areas, adults are clipping the heads of small grain plants (figure 1). The upper left photo was submitted to Dr. Janet Knodel. It was taken between Sawyer and Raub, ND. Please keep in mind the importance of scouting during this time and reflect on the two different possible thresholds for grasshoppers in adults – border threshold (21-40 per square yard) and an in-field threshold (8-14 per square yard). If thresholds are met, control may be required in some circumstances. Some grasshopper nymphs are still observed in the area. Spider mite calls have begun to come in for horticultural related topics. Currently, no agricultural related spider mite calls have been received; however, drought conditions tend to allow populations to rise with crops, such as soybean, already under stress. Red Seed Sunflower Weevils are also being observed in the region. Please refer to Dr. Knodel's article on red seed sunflower weevil in last week's edition of the Crop & Pest report for information on thresholds and control.

Crop harvest of small grains and pulses is increasing in the region but reported crop yields are low compared to the long-term average. Several small grain fields are being harvested for hay and some calls came in related to harvesting drought affected corn as hay or silage. Corn in the field is showing signs of stress and producing two ears per plant. Some canola fields will be ready for swathing later this week; however, the uneven fields would impose complications to decide the best time to start swathing.

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Figure 1. From the top left clockwise: Wheat head affected by grasshoppers; grasshopper in the wheat head; yellow field peas; sunflower

NORTHEAST ND

Producers have started combining/swathing small grains with yields ranging between poor to average (0-60 bu). Winter wheat yields were reported as 75 bu/acre. Some small grains are being cut for livestock and some of the crop is being grazed. Crops such as canola, soybeans, corn are in decline, showing symptoms of stress. Beans are cupping and even sunflowers are wilting in some areas. Grasshopper problems are very bad. Slough grasses are being cut. The alfalfa second cutting is wrapped up with variable results - from no cutting to decent in fields with timely rain. Hay is being tested for nitrates, with some levels high. Producers are worried about hay shortages and selling their cattle. In anticipation of drought, some producers planted millet in Walsh County which yielded better than expected. Water ponds and sources are drying up, thus reducing the quality of water for livestock. Many ranchers have been hauling or laying pipe to bring additional water to pastures.

[Anitha Chirumamilla](#)

Extension Agent Cavalier County

SOUTH-CENTRAL/SOUTHEAST ND

According to NDAWN, the region's July rainfall total ranges from 0.1 inch (Carrington, Courtenay and Dazey) to 2.6 inches (McHenry). Estimated daily water use during the past week (July 27-Aug 2) for plants emerged May 20 was about 0.25 inch per day for corn and soybean.

Harvest is in progress for the region's small grain crop. Grain yield is highly variable and well below average, but quality is good (e.g. high test weight and protein).

The following are the most advanced row crop growth stages observed at the CREC earlier this week: corn, R2 (blister) but nearing R3 (milk); soybean, R5 (seed development on pods within the upper four plant nodes); dry bean, R6 (seed developed to at least 0.25 inch in length); and sunflower, R6 (drying ray flowers). At these stages and normal growing conditions, approximate days to physiological maturity: corn, 40-50; soybean, 40-45; dry bean, 35-40; and sunflower, 30. However, with continued adverse growing conditions, these periods likely are liberal as plants attempt to produce seed as quickly as possible.

Upcoming crop tours:

August 12 – CREC Fingal area off-station corn research; 8 a.m.

August 25 – CREC Row Crop (corn, soybean and dry bean); 12:45 p.m.



Corn ear starting to show color in kernels indicating transition to R3 stage.

[Greg Endres](#)

Extension Cropping Systems Specialist
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SOUTHWEST ND

According to NDAWN, from July 26th to August 2nd Dickinson received 0 inches of rain, Beach 0, Amidon 0.06, Bowman 0.08, Hettinger 0.17, Mott 0.15, Carson 0.14, Mandan 0, Hazen 0, and Dunn 0. Drought and heat stress continue to have a negative impact on crop conditions, but conditions have been good for drying down the small grains for harvest. Grasshopper pressure has really exploded in the region, mainly an issue along the edge of fields. Red sunflower seed weevils are also present in the region. Small grain harvest is going strong with yields varying across the region from zeroed out or baled to 50 bushels/acre. Small grain trials at the Dickinson REC are averaging around 18 bushels/acre and trials at the Hettinger REC averaged around 44 bushels/acre. There are some pockets that received timely rains that have resulted in some great looking crops.



Figure 1. Grasshoppers on sunflowers near New Leipzig on August 2nd. (photo credit IPM scout Iris Dukart)

[Ryan Buetow](#)

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**WEATHER FORECAST****The August 5 to August 11, 2021 Weather Summary and Outlook**

This past week, temperatures were near average across much of the North Dakota Agricultural Weather Network (NDAWN) with the exception of parts of NW North Dakota and the far southern Red River Valley (Figure 1). These next 7 days will start with a similar trend, then the area will probably see a spike in temperatures on Sunday, back to near average early next week, then perhaps another spike in temperatures toward the middle of next week. These temperature transitions should come at least with some rain. The best opportunity for widespread precipitation appears to be Friday night through Saturday night.

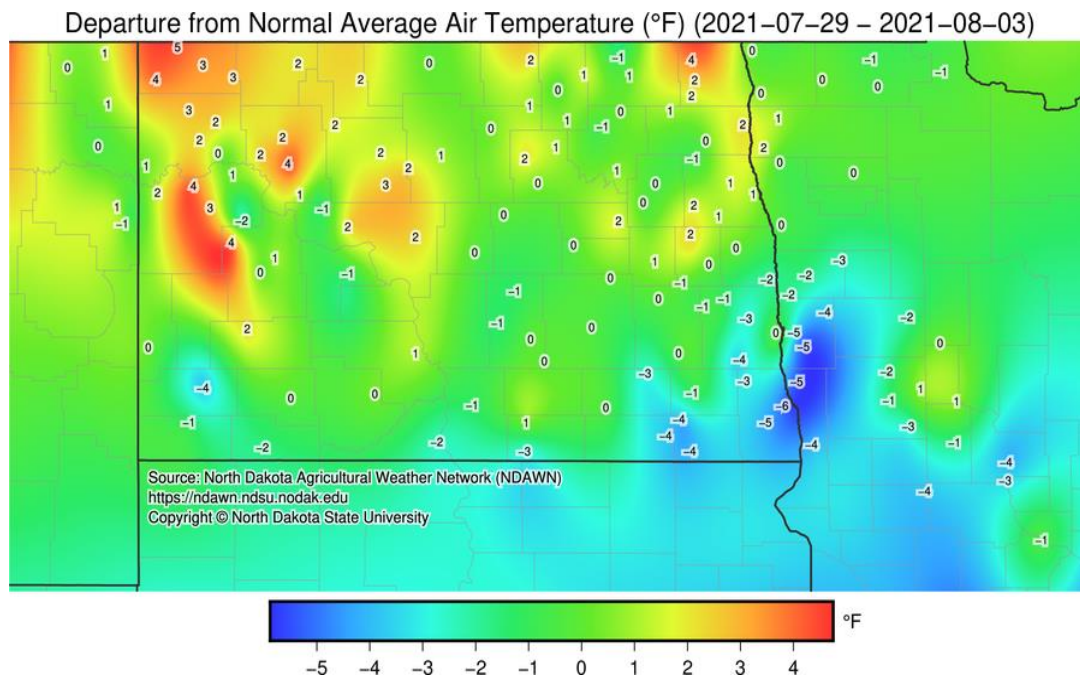


Figure 1. Temperature departures from average at selected NDAWN stations for the period of July 29 through August 3, 2021

This past week the rain was scarce with much of the NDAWN coverage area recording little or no precipitation (Figure 2).

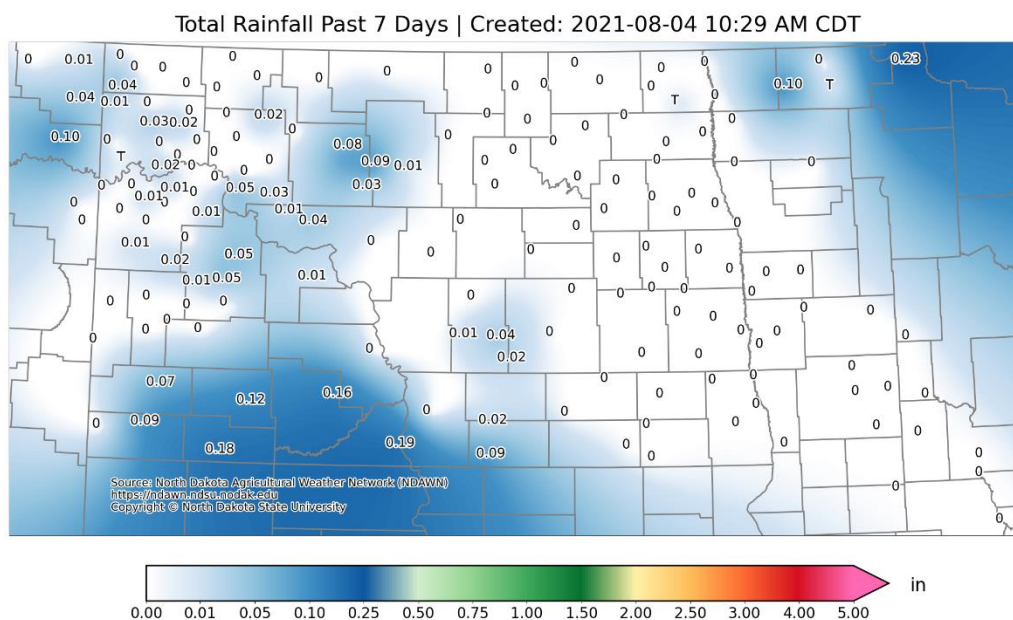


Figure 2. Total rainfall for the 168-hour period ending at 10:30 AM on August 4, 2021 at NDAWN weather stations

July marked the end of the second month of summer. Figure 3 has the Percent of Normal Rainfall for the first two month of summer. A high percentage of NDAWN stations have only recorded from 40% to 60% of average rain from June 1 through July 31, 2021.

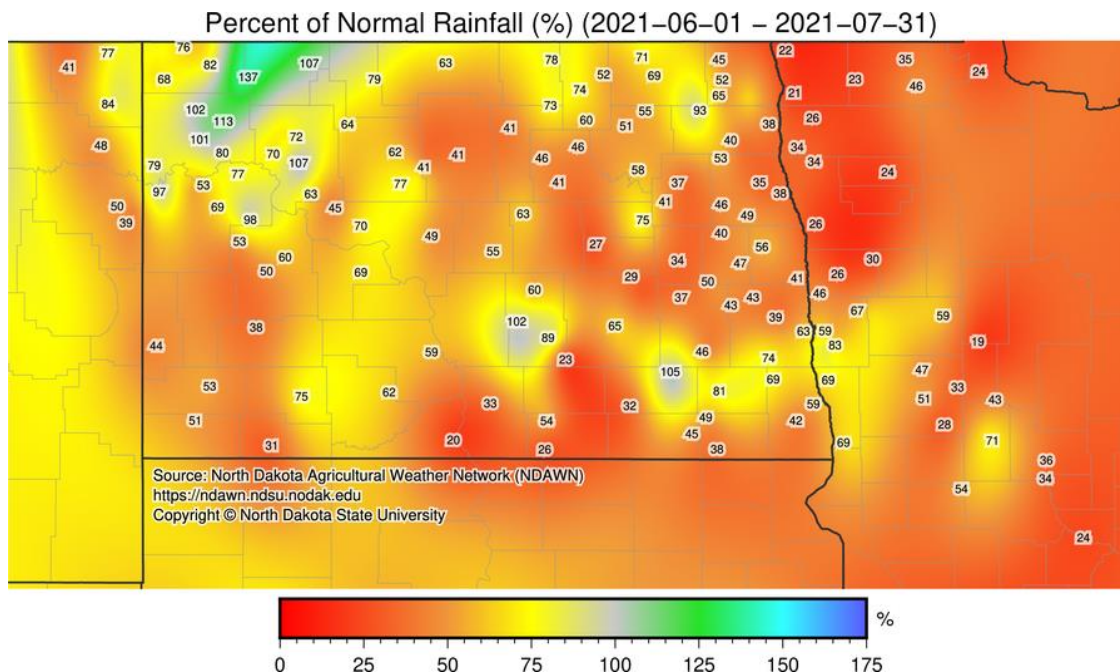
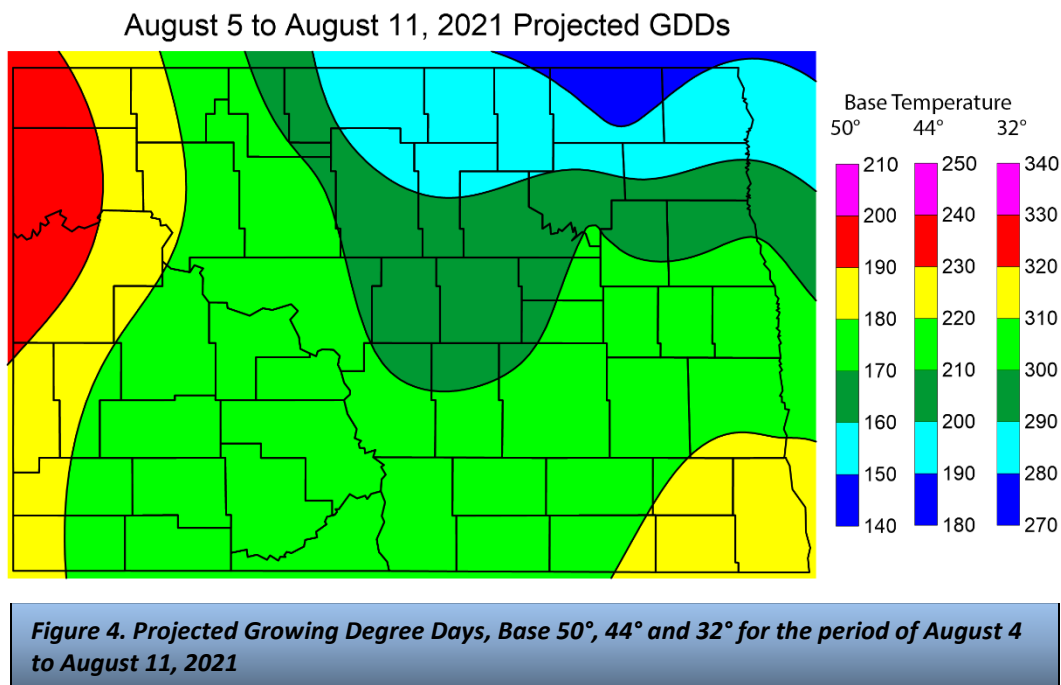


Figure 3. Percent from Normal Rainfall for selected NDAWN stations from June 1, 2021 through July 31, 2021.

The projected growing degree days (GDDs) base 50°, 44° and 32° for the period of August 5 through August 11, 2021 can be found in Figure 4.



Using May 1 as a planting date, the accumulated growing degree days for wheat (base temperature 32°) is given in Figure 5. You can calculate wheat growing degree days based on your exact planting date(s) here:

<https://ndawn.ndsu.nodak.edu/wheat-growing-degree-days.html>

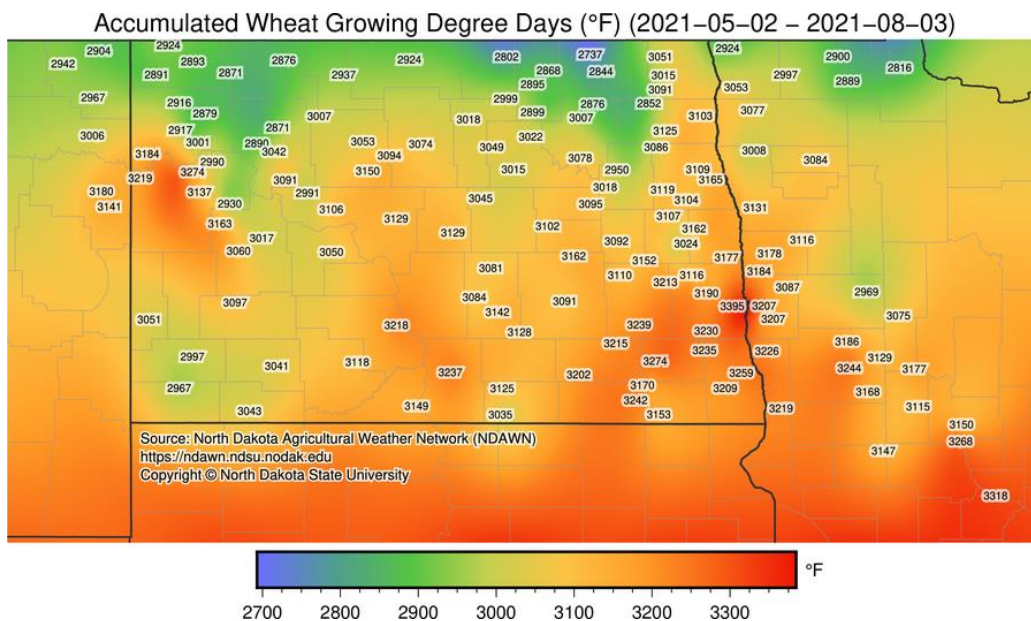


Figure 5. Accumulated Growing Degree Days for Wheat (Base 32°) since May 1, 2021

Using May 10 as a planting date, the accumulated growing degree days for corn (base temperature 50°) is given in Figure 6. You can calculate corn growing degree days based on your exact planting date(s) here: <https://ndawn.ndsu.nodak.edu/corn-growing-degree-days.html>.

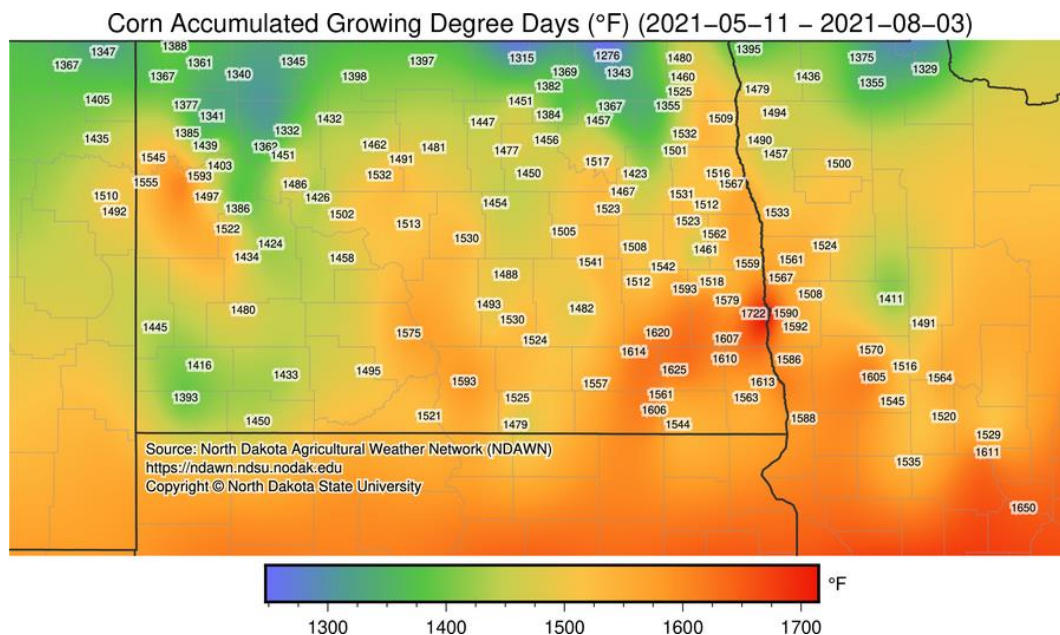


Figure 6. Accumulated Growing Degree Days for Corn (Base 50°) since May 10, 2021

Soybeans also use base 50° like corn, but NDAWN has a special tool for soybeans that, based on your planting date and cultivar, can estimate maturity dates based on average temperatures, as well as give you GDDs based on your planting date(s) you set. That tool can be found here: <https://ndawn.ndsu.nodak.edu/soybean-growing-degree-days.html>

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