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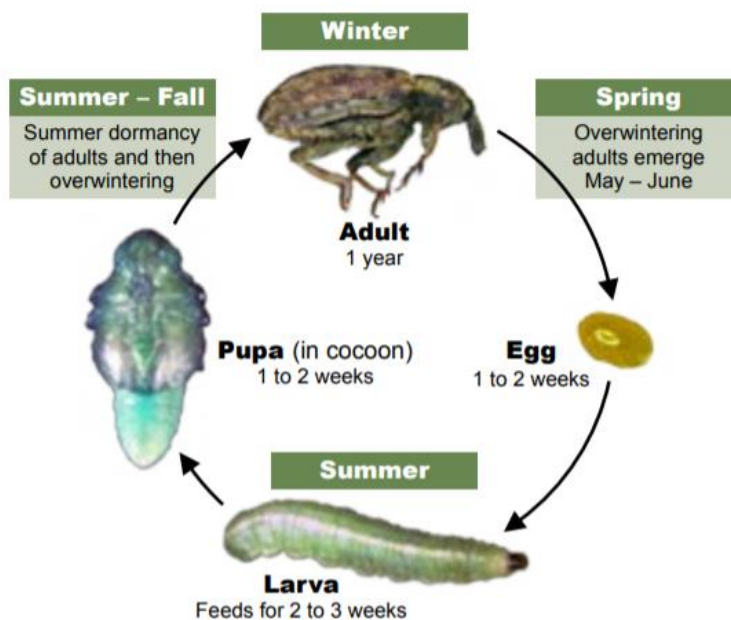
entomology

START SCOUTING FOR ALFALFA WEEVILS

Alfalfa weevils have one generation per year and overwinter as adults in shelterbelts. In the spring, the adult weevil emerges and will feed on the foliage to some degree. Adult alfalfa weevils are about ¼ inch long, with elbowed, clubbed antennae and a blunt snout. Adults are brown with short, somewhat thick golden hairs over the body and a distinctive brown stripe longitudinally along the center of the back. Females lay eggs in the stems of alfalfa.

Eggs hatch in one to two weeks. Larvae emerge from the stem and begin feeding on the growing tips of the alfalfa plants. Larvae pass through four growth stages (instars) before reaching maturity. Mature larvae are about ¾ inch long and have a black head capsule and a wrinkled green body with a white stripe running lengthwise along the top. Younger larvae are similar in appearance but smaller.

Larvae continue to feed on tender leaf tissue as they grow. Mature larvae feed for two to three weeks before pupating. Mature larval feeding causes most of the defoliation and crop damage. A heavily infested alfalfa field will have a silvery appearance as the green material is eaten off the leaves by larvae. After larvae complete their development, they drop to the soil for pupation (non-feeding stage). The new generation of adult weevils emerge in 1-2 weeks from puparium and then overwinter in debris.



Life cycle of the alfalfa weevil

The degree day model for alfalfa weevil (base temperature of 48 F) is a useful IPM tool. It predicts the timing of adult emergence, when different life stages will occur, and when we should scout for adult weevils or larval feeding injury in alfalfa fields. The degree day table (below) summarizes the Accumulated Degree Day (ADD) units and alfalfa weevil activities.

Alfalfa Weevil Activity	Accumulated Degree Days
No activity (overwintering as adult)	0-199
Adult weevils emerge and move to alfalfa fields for egg-laying in stems (beginning scouting)	200-299
Egg hatch and first instar larval feeding (light feeding damage)	300-371
Second instar larval feeding (light feeding damage)	372-438
Third instar larval feeding (heaviest feeding damage)	439-504
Fourth instar larval feeding (heaviest feeding damage)	505-595
Pupation	596-814
Adult emergence and in fall move to overwintering sites	>815

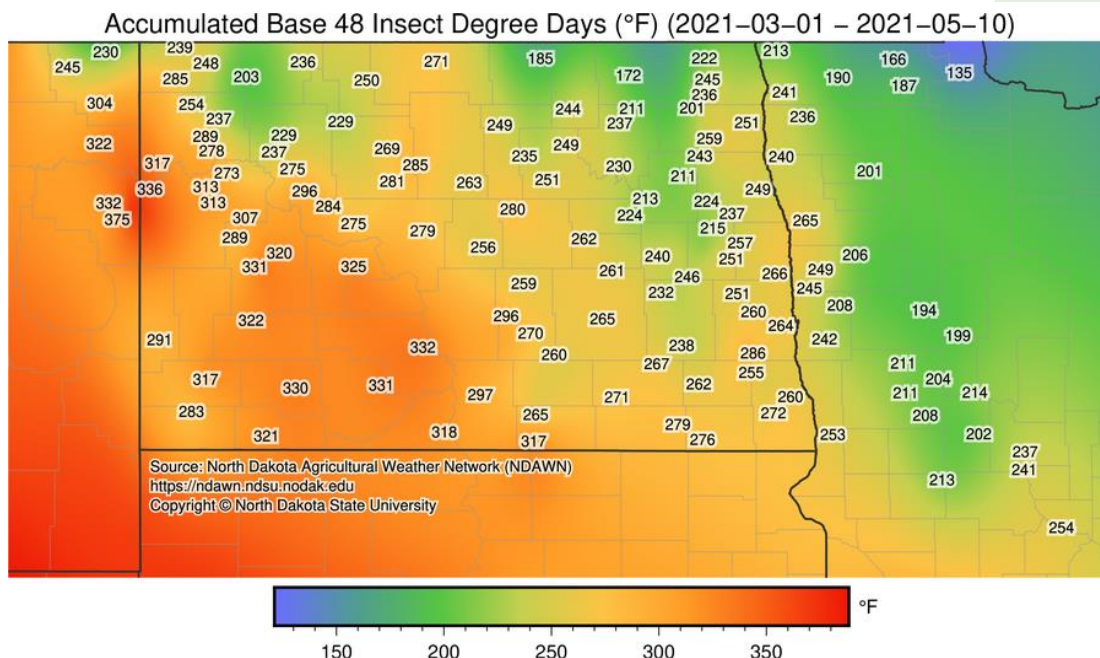
In North Dakota, the ADD units range from a low of 172 ADD in the northeast area to a high >300 ADD in the southwest to south central areas (see map). **Growers should start to scout their fields for adult alfalfa weevils after 300 ADD, and for larvae from 371 through 595 ADD.** The heaviest feeding occurs as mature larvae appear (from 439 through 595 ADD), usually mid-June through mid-July.

To assess the insect DD model, go to the NDSU's [NDAWN website and Applications – Insect DD](#). Then, click on the *Map* tab and select 48 F for your base temperature and *Degree Days (DD)* for your map type. Then, click *Get Map*.

For more information, see the NDSU Extension publication on [IPM of Alfalfa Weevil in North Dakota E1676](#).



Alfalfa weevil feeding by larvae (P. Beauzay)



[Janet J. Knodel](#)
 Extension Entomologist



SUNFLOWER PRODUCTION

North Dakota growers continue to be the No. 1 producers of sunflowers in the U.S., harvesting 715,000 acres of the crop in 2020. However, the USDA planting intentions report from March 2021 indicated that producers are intending to plant only 380,000 acres of oil hybrids and 38,000 acres of non-oil sunflower. With the current drought in North Dakota, some producers may want to shift some acres from other crops to sunflower production. If producers are considering changing acres, it would be important to select an appropriate hybrid.

Key factors in choosing a sunflower hybrid are:

- Oil type
- Herbicide trait
- Yield - Select hybrids with consistently high yields.
- Maturity - Some hybrids may mature 10 or more days later than early maturing hybrids.
- Plant height and lodging
- Disease tolerance - Growing disease-resistant hybrids reduces the chances of yield loss.

Sunflower hybrid information is available at

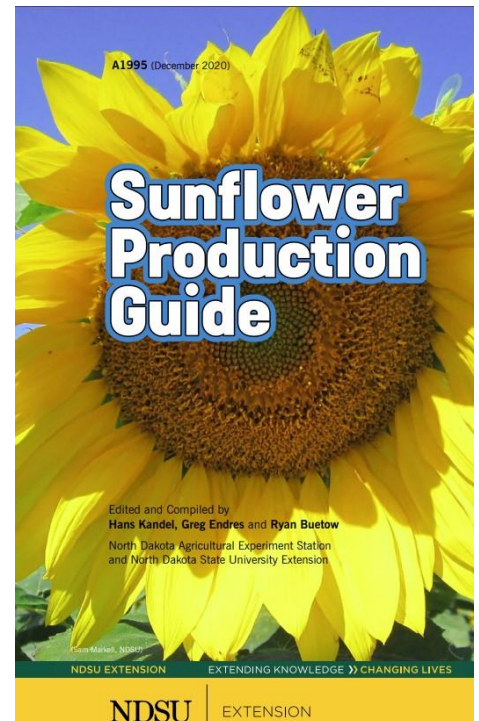
<https://www.ag.ndsu.edu/varietytrials/sunflower>.

For production information, consult the sunflower production guide.

The updated "Sunflower Production Guide," a spiral-bound publication, includes information about hybrid selection, understanding the growth and development of sunflower plants, field selection and preparation, planting date guidelines, seeding rates, frost tolerance and damage, soil fertility requirements, weed control, insect pest and disease management, drying and storage. The publication has several photos of agronomy issues, weeds, insects and diseases common in sunflower production.

Sunflower growers can obtain one free copy of the publication (as long as the supply lasts) from the National Sunflower Association (NSA) by calling 888-718-7033. Or a grower may request a complimentary copy via email at info@sunflowernsa.com. For non-growers, the guide is available for sale from the NSA's online catalog for \$15, including shipping, at <https://www.sunflowernsa.com/about/store/mh01>.

An online version of the updated "Sunflower Production Guide" is available at <https://www.ag.ndsu.edu/publications/crops/sunflower-production-guide>.



[Hans Kandel](#)

Extension Agronomist Broadleaf Crops



LOW AVERAGE DAILY SOIL TEMPERATURE DELAYS SUGARBEET SEEDLING EMERGENCE

Sugarbeet seeds germinate and emerge over a wide temperature range in the presence of adequate moisture and oxygen.

In Minnesota and North Dakota, growers have completed planting in most areas. Average daily bare soil temperature has been relatively low (48 F at Cavalier to 51 F at Wahpeton) over the past two weeks during planting. In addition, soil moisture has been low. As a result, germination and emergence have been very slow, especially where there is inadequate moisture. With soil temperature forecasted to increase in the next week, emergence will improve in areas where there is adequate soil moisture. In dry areas, a good rainfall will be required to increase emergence.

The following table gives approximate days to emergence of sugarbeet seeds planted at different soil temperature ranges with adequate moisture. Emergence will be further delayed if moisture is lacking.

<i>Soil Temperature (°F)</i>	<i>Days to Emergence</i>
38-45	21 days or more
45-52	10-21 days
52-60	7-12 days
60-70	5-7 days



Figure 1. Slow sugarbeet seedling emergence at Hickson, ND

You can easily obtain soil temperature and all you need to know for sugarbeet production by downloading and using the “Sugarbeet Production Guide” App available for free download at:

<https://apps.apple.com/us/app/sugarbeet-production-guide/id1369831563>

[Mohamed Khan](#)

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GROWING PULSE CROPS PODCAST LAUNCHES SEASON 2

The Growing Pulse Crops podcast series is entering into its second season, with six episodes so far and new episodes being released every other week. The series aims to highlight the farmers, researchers and industry leaders who are working towards building more productive and resilient pulse cropping systems.

On the most recent episode, farmer Tony Wagner discusses how he uses peas and a subsequent cover crop to build soil health on his farm. For the past 15 years, Tony Wagner has been on a journey to improve the soil health of his farmland, which runs the gamut from sandy to high clay. Tony shares how he got into growing peas, why he's stuck with them, and how they fit into building soil health. Tony got into cover cropping via an attempt to grow two crops of peas in the same field, in the same season. While the second crop succumbed to unexpected weather conditions, he was impressed with the benefit to the soil.

"The next year we put spring wheat on that ground and we pulled off on that type of soil, which is a very light soil, probably the best wheat that we've ever pulled off. And we did a soil test on it and the nitrogen was pretty high on that soil. So we decided to slowly start working into cover crops." - Tony Wagner

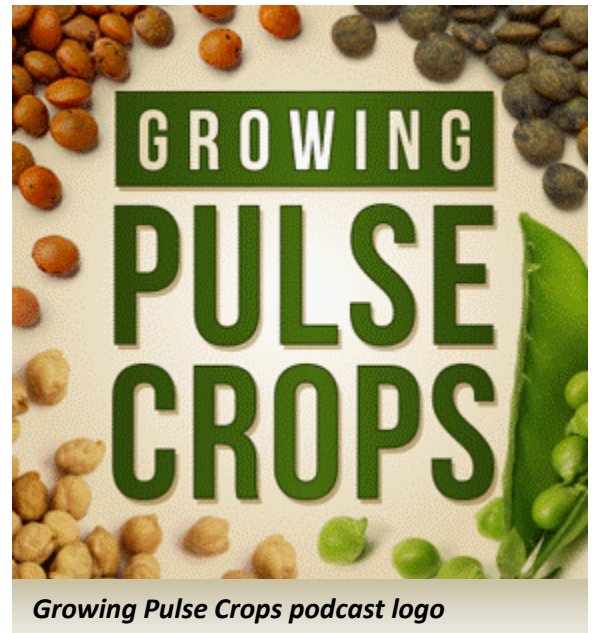
Tony has continued to experiment with cover crops, including use of different varieties to see what provides the most benefit to his operation. Along with nitrogen benefits, he has observed much less wind and water erosion, improvement in areas of high salinity and better water infiltration.

Tony has recently begun incorporating flax as a companion crop in with his field peas. He chose flax as the pre-emergence herbicides used are the same as field peas. The flax companion crop helped the peas stay upright, while the monocrop peas were lodged. While the growing conditions led to delayed harvest due to late maturing flax, Tony says he would like to attempt this trial again with different varieties going forward to see if the maturity timing can be better coordinated.

To listen to the full episode, along with season one and the rest of season two, visit the website <https://www.growingpulsecrops.com/> or search for Growing Pulse Crops on your smartphone podcast app.

The podcast series is hosted by Tim Hammerich, who also hosts the Future of Ag and Soil Sense podcasts. Growing Pulse Crops is produced by North Dakota State University plant pathologist Dr. Audrey Kalil and the North Central IPM Center Pulse Crops Working Group with funding from the North Central IPM Center and the USA Dry Pea and Lentil Council. Visit <https://www.ncipmc.org/projects/working-group-projects/> to learn more about the group.

For more information about the podcast, contact Dr. Kalil at 701-774-4315 or audrey.kalil@ndsu.edu.



Growing Pulse Crops podcast logo

[Audrey Kalil](#)

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'LOOSE FLUFFY DIRT'

An interesting question was asked by a producer recently, whether there is an official texture/aggregate designation to describe 'loose fluffy dirt'. Of course, the unofficial designation would be more aptly described as 'loose fluffy soil' if the material was actually in a field, rather than the fence line, ditch, tree belt or road. If it was in the latter, 'loose fluffy dirt' would be a proper descriptor.

The USDA-NRCS has a designation for this material as an aggregate class named 'single-grain structure'. Single-grain structure is usually used to describe structure found with coarse sand grain dominated soil, such as found in a Sioux soil series. All of our state soils have a little or a lot of smectitic, shrinking-swelling clays, which expand and contract with wetting-drying and freeze-thaw. The many freeze-thaw events we have had this spring combined with very dry conditions has broken down larger, more stable aggregates into single-grain structures resembling dust. This dust is easily blown away by winds. The larger single-grains may end up in the farmers' ditch, or in the neighbors no-till field, but the majority ends up almost anywhere on earth, carried by winds to high altitudes and moved hundreds/thousands of miles away. Farmers with years of continuous no-till history are sheltered from this problem, not only due to the residue which slows surface wind velocity, but due to the undisrupted mesh of fungal hyphae, last-years roots, and binding agents from past discharge of the vast array of soil microorganisms that are present in this tillage management system.

Rainfall on single-grain soil will help bind the soil particles together briefly by weak bonding between the polar water molecules and the clay/organic matter negative charges. Heavy rainfall will serve to easily move the soil away through water erosion, and when drying a crust will form. The best-case scenario is light rainfall over days that will provide soil moisture for crop germination and growth and increased soil microbial populations that will discharge materials that start the aggregation process and keep the soil in place.

COMPREHENSIVE LIST OF PRODUCTS AND CHEMISTRIES THAT NEUTRALIZE SOIL SALTS

Here is a comprehensive list of products and chemistries that can neutralize soil salts:

Thank you for reading!

Any Questions?

[Dave Franzen](#)

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WEED OF THE WEEK ARCHIVES

Starting last September, my team and I have been writing a weekly “weed of the week” article for the ANR Exchange e-newsletter. The current archiving system for these articles only saves the last 20 weeks of content. We are working to make all the articles available in one convenient link, but in the meantime these articles can be accessed here: <https://us4.campaign-archive.com/home/?u=da6011dcb1763364e32f87da1&id=d3a2112c04>.

Some of these weed of the week articles will be updated for the *Crop and Pest Report* throughout the season as more questions come in about specific weeds, but we wanted to raise awareness about the weekly articles that highlight biology, identification, and some control measures of weeds that are found in various settings across North Dakota.

EARLY SEASON ODDBALL WEEDS

Every spring we receive weed id samples of a few weeds that are easy to find across the landscape, yet do not pose much of a threat to crop production. Two weeds that fit this bill for 2021 are fairy candelabra (*Androsace occidentalis*) and waterpod (*Ellisia nyctelea*). Both weeds can be found in areas of fields without any ground cover, and they also flower early compared to many other plants in the landscape.

Fairy candelabra is often found at high densities in fields in April and May. However, this plant will stay relatively small and will die off as the temperatures warm up. Typical seedbed preparation in both conventional and no-till will control this plant. Even if no control measures are taken, fairy candelabra will not be competitive with crops since these plants are currently nearing the end of their life cycle. Fairy candelabra has highlighted as the Weed of the Week on April 20th: <https://drive.google.com/file/d/19O2vyUn1liukPRBQTlc6Yu96dLviU5zc/view>.



Pre-flowering fairy candelabra in a garden bed. (photo credit Stephanie DeSimini)



Mature fairy candelabra pulled from a flower bed.

(Continued on next page)

Waterpod is another weed that is showing up across the landscape this year. Although the leaf structure may remind some of common ragweed or biennial wormwood, waterpod plants are much larger and more advanced than either of those two weeds at this stage in the growing season. Waterpod will be flowering and producing seed soon and will complete its life cycle as we near the summer solstice. Like fairy candelabra, typical seedbed preparation will control waterpod. For more information about this weed, please see this week's Weed of the Week article:

<https://drive.google.com/file/d/1e4RebGG257-v5DarPrzFe6EOwV8hore/view>



Waterpod in a bare spot in a no-till field in early May.



Waterpod flower and seedpod pulled from a field in late May of 2020.

[Joe Ikley](#)

Extension Weed Specialist

SOIL EROSION AND HERBICIDE INJURY

Off-target movement of herbicides is often associated with physical drift at the time of application. In addition, herbicides can move off the target site after application as a gas (volatility), in runoff water, and on sediments from wind-blown soil erosion. The powerful wind events of late April, coupled with dry weather conditions resulted in significant soil erosion from unprotected croplands. That means there is potential for herbicides to move down range on soil particles to injure susceptible plants.

How serious of a problem this will be is not known at this time. In a very rare circumstance, widespread damage occurred in SE Idaho when the herbicide Oust (sulfometuron) a sulfonyl urea herbicide, moved on soil particles from burnt over public rangeland to sugarbeet and potato fields in 2001. Tens of thousands of acres were impacted and lawsuits were quickly filed against the U.S. Bureau of Land Management (the party responsible for the applications) and DuPont (the pesticide registrant at the time). In experiments conducted by the University of Idaho, it was demonstrated that sugarbeet and potato could be injured at soil contamination levels in the parts per trillion (<https://tinyurl.com/UI-Oust>).

Far less dramatic injury was detected in Canadian experiments in Southern Alberta in the early 1990's. But they were able to demonstrate that herbicides could indeed be transported down range, from wind erosion on soil particles. (<https://tinyurl.com/Alberta-Herbicide>).

In North Dakota, NDSU/UMN Sugarbeet Agronomist Tom Peters has observed injury from contaminated soil particulates in sugarbeet, but the damage was confined to field margins. In summary, it is likely that some problems will develop this season, but it is NOT likely that it will be found on a vast scale like the Idaho incident.

[Andrew A. Thostenson](#)

Pesticide Program Specialist

YOU PLANNED FOR LAY-BY TREATMENT IN SUGARBEET? CONSIDER A PREEMERGENCE APPLICATION.

We often plan our weed management strategies during winter meetings or in brain-storming meetings around the coffee pot. The Sugarbeet Agriculturalists and I agreed we would introduce a split lay-by program for waterhemp control in districts in northern North Dakota and Minnesota or districts with no current experience with either soil residual products or waterhemp in 2021. Split-layby means an application of a chloroacetamide herbicide once sugarbeet are at the 2-lf stage and preemergence to waterhemp followed by a repeat application approximately 18 days later or once sugarbeet reach approximately the 6-lf stage. We planned to time the first lay-by application around May 15.

Reality has set in and we have very few emerged beets especially north of Minnesota highway 200 and rainfall has been nonexistent to incorporate herbicide into soil. However, the calendar date indicates we need to prepare for waterhemp emergence which is right around the corner. Can we afford to wait until 2-lf sugarbeet? Do we need to consider a Plan B?

I discussed waterhemp control this week with Kevin Hollands, Crop Consultant, CENTROL Consulting near Fisher MN. Kevin supports producers in the East Grand Forks, Fisher, and Crookston corridor or along US 2. Kevin suggested taking the layby approach and implementing it preemergence. That is, applying a chloroacetamide herbicide on beets that have not emerged using the layby rates. Dual Magnum is the only chloroacetamide that can be used preemergence and it is normally applied at 8 to 12 fl oz/A using a 24c local needs label in sugarbeet. Kevin suggested the 16 fl oz/A rate, mostly because of calendar date.

I support Kevin's recommendation. We reduce the Dual Magnum rate in mid-April when it is cold and wet to minimize sugarbeet injury. Sure, it's still cold but it certainly isn't wet and my calendar says May 12. I trust we will 'hook a rain' in the next 5 to 7 days to incorporate product so that it is available at waterhemp emergence. We can decide waterhemp control in-season later.

WHEN DOES WATERHEMP EMERGE AND ARE THERE TOOLS TO FORECAST?

Controlling waterhemp in sugarbeet has been my most important weed control challenge since arriving at NDSU in 2014. Early on, we decided we needed to better understand waterhemp biology including the calendar date when waterhemp emerged in sugarbeet. Dr. Bob Hartzler, Iowa State University, suggested we track growing degree days (GDD) using a technique successfully implemented in Iowa, to simply scout by grouping weeds (Iowa State University IPM-64). Hartzler postulated it might be possible to estimate waterhemp emergence date in order to time application of lay-by residual herbicides in sugarbeet by tracking GDDs.

We have had mixed results tracking GDDs to forecast waterhemp emergence. For example, cumulative GDD ranged from 42 to 189 from January 1 to May 10 between the years 2016 to 2021 at the NDAWN station near Sabin, MN. Two data clusters were observed across years, the first averaging 150 GDDs and representing years 2016 to 2018 (Table 1). The second cluster averaged 54 GDDs and represented years 2019 to 2021. The earliest waterhemp observed was near Sabin on May 11, 2020, a low GDD cluster season.

Table 1. Cumulative growing degree days, January 1 to May 10, Campbell and Sabin, MN, 2016 to 2021.

Location	2016	2017	2018	2019	2020	2021
-----Cumulative Growing Degree Days, base 48F-----						
Campbell, MN	206	132	123	57	66	50
Sabin, MN	189	133	129	42	64	57

We also attempted to correlate waterhemp emergence with soil temperature. Soil temperature instrumentation measures temperature 4-inch (NDAWN) or 6-inch (Minnesota) or much deeper than weed

seed emergence. We observed a stratification of soil temperature, the warmest temperature near the soil surface and the coldest 4 or 6-inch deep where bare soil temperature measurement is collected.

Soil temperature at Sabin was tracked in 2020 and 2021 (Figure 1). The only meaningful conclusion I can make, with all other factors being the same, waterhemp emergence likely would occur in 2021 on a similar date compared to 2020. However, there were differences between seasons. Fall 2019 was extremely wet with late season waterhemp seed production. These small plants made seed which was deposited on the soil surface. Moreover, fall tillage was not completed due to late season rainfall and wet fields. Finally, there was significantly more snowfall covering fields in winter 2019-2020 which protected soils from deep frost, enabling soils to warm sooner and potentially allowing waterhemp to emerge sooner in 2020 (Figure 1). Thus, one would predict waterhemp emergence in 2021 will be later than 2020.

Where do we stand and what are our best recommendations to forecast waterhemp emergence? We continue to use GDD and soil temperature but only as aids. In general, waterhemp emergence in sugarbeet seems to be geographic and season specific. For example, we anticipate and plan for waterhemp emergence on approximately May 10 in the Southern Minnesota Beet Sugar Coop region near Renville, MN. We anticipate waterhemp emergence on approximately May 15 along the boundary between Minn-Dak Farmers Coop and American Crystal Sugar Coop near Sabin, MN and Kindred, ND. Finally, we anticipate waterhemp emergence on approximately May 20 east and west along US 2 near Grand Forks. Emergence probably is even later along North Dakota 5 and Minnesota 175.

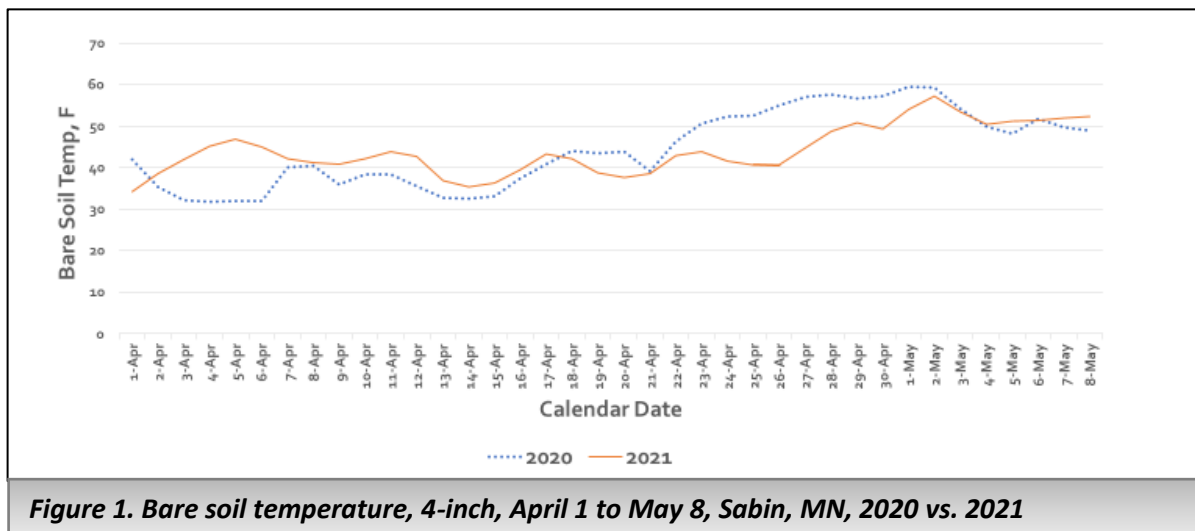


Figure 1. Bare soil temperature, 4-inch, April 1 to May 8, Sabin, MN, 2020 vs. 2021

[Tom Peters](#)

Extension Sugarbeet Agronomist
NDSU & U of MN



horticulture

TIME TO CHECK FOR TICKS

Ticks are out and looking for mammal hosts like you, deer, dogs and others to feed on! In dry conditions, they are more susceptible to desiccation and death, so tick populations may be lower this year. Here's some updated information from last year's article.

Two ticks that are common in North Dakota include the smaller black legged tick (or deer tick), *Ixodes scapularis*, and the larger American dog tick, *Dermacentor variabilis* (see photographs below). **Black legged tick is the species that vectors Lyme disease.**

Ticks can be a significant threat to anyone's health if you enjoy hiking, camping, hunting, playing or working outside in undisturbed grassy or wooded areas. **Be safe this summer and do periodic 'tick inspections' every 2-3 hours when outdoors to prevent tick-borne diseases.**

If you find a tick, remove it right away. See the [Center for Disease Control and Prevention](#) (CDC) instructions (below) on how to remove a tick:



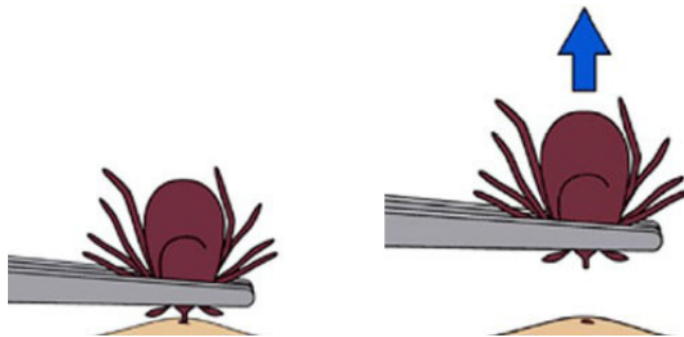
Black legged tick or deer tick, *Ixodes scapularis* (vectors Lyme disease). (P. Beauzay)



American dog tick, *Dermacentor variabilis*. (Gary Albert, Harvard University,

How to remove a tick

1. Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
2. Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.
4. Never crush a tick with your fingers. Dispose of a live tick by putting it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet.



The CDC states that Lyme disease is the most commonly reported vector borne illness in the United States. Lyme disease is concentrated in in the Northeast and upper Midwest. The black legged tick is most common in eastern North Dakota, but is a more common occurrence in western North Dakota too. The Lyme disease incidence rate for 2018 was 1.8% (Source: <https://www.cdc.gov/lyme/stats/tables.html>).

Lyme disease is caused by the bacterium *Borrelia burgdorferi*. Symptoms of Lyme disease includes: Bull's eye rash, headache, fever and fatigue. In a worst case scenario, infections can cause arthritic joints, and affect the nervous system causing facial paralysis, and spinal cord, brain or heart problems. Lyme disease must be treated immediately with antibiotics. It can take 2 to 3 weeks to recovery if treated early. The later you wait for treatment; your symptoms will become more severe and more difficult to cure. A vaccine for Lyme disease is not currently available. For more information, please see the [CDC website: https://www.cdc.gov/ticks/tickbornediseases/lyme.html](https://www.cdc.gov/ticks/tickbornediseases/lyme.html).

The Center for Disease Control and Prevention (CDC) recommends the following strategies for field workers to prevent tick bites:

- Minimizing Direct Contact with Ticks by avoiding woody and high grass areas and walking in center of trails, if possible. Ticks are most active in May through August in North Dakota.
- Wear light-colored protective clothing, so it is easier to see ticks crawling up.
- Tuck pant legs into socks.
- Spray bug repellent with 20-30% DEET or 20% picaridin (synthesized pepper plant) on exposed skin and clothing, especially on lower legs. This should provide some protection up to 12 hours. Or wear clothing treated with permethrin, which can be washed up to 70 times before losing effectiveness.
- Quickly find and remove any ticks from body by using a tweezers. Grasp tick close to skin and pull straight up to avoid breaking off the tick's mouthparts in the skin. Clean bite area with rubbing alcohol or soap and water. Apply an antiseptic to the bite site.
- Inspect yourself every 2-3 hours to find any ticks crawling on you and to remove them before they attach to feed on your blood. Ticks like to hides in hair, behind ears and other areas and may be difficult to find.
- Wash any clothing that you were wearing soon and then dry in high heat for an hour to kill any ticks. Otherwise, ticks can attach to you later after hitchhiking on your clothes into home.
- Reduce tick habitat near home.
 - Keep lawns mowed around home.
 - Place a 3-ft wide barrier of wood chips or gravel between lawns, patio or play areas and wooded areas to prevent tick movement.
 - Exclude wildlife (especially deer) that may be carrying ticks into your yard.
- Some insecticides registered for control of ticks by homeowners in residential areas (yards) include: carbaryl (Sevin®), cyfluthrin (Tempo®, Powerforce™), permethrin (Astro®, Ortho® products, Bonide® products), and pyrethrin (Pyrenone®, Kicker®). Always read and follow the EPA approved label on the product container.

[Janet J. Knodel](#)

Extension Entomologist



EMERALD ASH BORER AWARENESS WEEK

Every year, just before Memorial Day, I work with colleagues at the North Dakota Forest Service (NDFS) and North Dakota Department of Agriculture (NDDA) to do an informational campaign during “Emerald Ash Borer Awareness Week.” Emerald ash borer (EAB) is an insect from Asia that attacks and kills ash trees, such as our native green ash and black ash. We don’t exactly “celebrate” the week, but instead we use it as an opportunity to remind people about the importance of tree species diversity and the role of firewood in the spread of this harmful insect.

As a scientist, though, I’d like to start with some data:

- 35 – Number of states in which EAB has been found. Fortunately, North Dakota still isn’t one of them, but the insect has been found in the Sioux Falls area of South Dakota, Sauk Centre, Minn., and even in Winnipeg, Manitoba.
- 5 mile per year – The average spread of EAB, just by flying
- 55+ mph – The rate of spread of EAB when moving within infested firewood
- 55 – Average number of eggs laid by a female EAB
- 150 – Maximum number of eggs laid by a female EAB
- 30% – Proportion of North Dakota conservation plantings consisting of green ash
- 60% – Proportion of North Dakota native forests consisting of green ash
- 65%+ – Amount of green ash in many communities in North Dakota
- 250 – Estimated number of EAB traps to be distributed this summer by the NDDA
- **0 – Number of EAB found in North Dakota so far**

Every year, my colleagues and I inspect dozens of ash trees around the state to see if they’re infested with EAB. So far, we’ve found no EAB, and we’re hoping the same holds true for 2021. But the insect gets closer every year, which is worrisome, given the large percent of ash trees in our forests. Fortunately, we have several things we can do to minimize the risk of EAB. First, when using firewood, “Buy it where you burn it.” When you go camping, get your firewood at your destination; don’t bring it with you. Moving infested firewood is one of the main methods of EAB spread. Most campgrounds have firewood for sale on-site or they list nearby vendors.

Second, we can treat our forests like the long-term investment that they are. As my financial adviser likes to say: Diversify! Diversify! Diversify! Check out the North Dakota Tree Selector (<https://www.ag.ndsu.edu/tree-selector>) for a listing of tree (and shrub) species that are broadly adapted across North Dakota.

Finally, if you think your ash trees might be infested with EAB, please don’t hesitate to contact your county Extension agent, the NDFS or the NDDA to arrange for a site visit. If this destructive insect is in North Dakota, we want to find it sooner rather than later.

I’m grateful that EAB hasn’t been found here yet. Every year that we delay gives us more time to plant new/different tree species. What will you plant this year?

For more information, see the NDSU Extension publications on EAB:

- [Emerald Ash Borer: Biology and Integrated Pest Management in North Dakota \(E1634\)](#)
- [Insects Frequently Confused with Emerald Ash Borer in North Dakota \(E1604\)](#)



Emerald ash borer (L. Bauer, USDA Forest Service Northern Research Station)

[Joe Zeleznik](#)

NDSU Extension Forestry Specialist



AROUND THE STATE

NORTH CENTRAL ND

A dry pattern continues to grasp the north central region of North Dakota. For most of the region, the precipitation enjoyed by parts of the western and southwestern areas of the state was not observed. Here are some quick precipitation reports as observed by some area NDAWN stations over the last week (beginning May 3rd): Minot: 0.02"; Bottineau: 0.00"; Garrison: 0.00"; Karlsruhe: 0.02"; Mohall: 0.01"; Plaza: 0.05"; and Rugby: 0.00". Additionally, the soil temperature at the NCREC appears to be in the low to mid 50's (degrees F).

As of May 10th, planting remains rather limited. Small grains and pulses are in the ground, but cold overnight temperatures (low 20s) have slowed planting for canola and soybeans. The NCREC agronomy teams started canola planting on May 10th and are looking to begin soybean planting this week, with warmer day and nighttime temperatures expected for the remainder of the week. Some pre-emergence herbicides are being put down. Pennycress, mustards, and kochia are some of the weeds that are currently emerging, however, the drought is slowing that progress for weed development.

If growers decide to plant into dry soils, avoid to go deeper than the 1.5-inch for most crops. Despite soil moisture in the upper soil profile, chasing the moisture beyond two-inch depth can be risky. Make sure to utilize good seed quality, mainly regarding to vigor. Some seeds require a high percent of their weight in moisture to start the germination process. One important issue to pay attention to when planting deeper is the possibility of furrows sealing back and crusting, which will make emergence more difficult and could increase the risk of pathogen infection. Despite the dry pattern we are facing in the region, producers must take into the account the forecast and long-term weather pattern and adjust the crop management accordingly.



Figure 1. Wheat emerged (left) and wheat planted deep (right)

The Good Bugs Workshop is fast approaching. Participants will learn about supporting beneficial insects that provide pest control throughout this webinar series. Conservation biological control is a science-based pest management strategy that seeks to encourage beneficial insects back into cropping systems for natural pest control, ultimately rewarding farmers with economically-viable pest management systems. Due to the COVID Pandemic, this

year's events will be virtual. The cost is free; however, pre-registration is required. To register, email TJ at travis.prochaska@ndsu.edu or use the QR code below.



Scan to register for the Good Bugs Workshop.

[TJ Prochaska](#)

Extension Crop Protection Specialist
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[Leo Bortolon](#)

Extension Cropping Systems Specialist
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NORTHWEST ND

Planting continued at a good clip last week with farmers getting many, if not most, of their acres seeded. Saturday, May 8th brought some badly needed rain to Williston and points south. The WREC NDAWN station recorded 0.52", Watford City 0.38", and Medicine Hole in Dunn County 0.69". The Epping station, located roughly 10 mi north and 20 miles east of Williston, saw 0.21". Unfortunately, the rain didn't make it much farther north or east beyond that and NDAWN stations at Alamo, Grenora, Crosby, Bowbells, Ray, and Ross recorded no rain. The rain will help get seeded crops out of the ground where it fell, but with no subsoil moisture to tap into, we will need to continue to get timely rains to make a crop. High's this week are predicted to be in the upper 60's to mid-70's with overnight lows mostly in the 40's. There are small chances for scattered showers Wednesday and over the weekend, which we hope materialize.

Below are photos of a 5-year-old alfalfa stand at WREC taken on 5/10/2021. The photo on the left is representative of poor areas of the field while the photo on the right is one of the better spots. Regrowth is generally poor with most of the stems in the field only 2-4" tall. We are still extremely dry across the Northwest as you can see in the background of both photos. It looks more like a dry fall right now than it does spring.



[Clair Keene](#)

Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

Crop planting continues at a rapid pace but plant establishment continues to be slow due to cool air and soil temperatures, and generally dry soils. According to NDAWN, rainfall April 1 through May 10 ranged from 0.3 inch (Dazey, McHenry and Robinson) to 1.9 inches (Lisbon), with 0.8 inch at the Carrington Research Extension Center (CREC).

Alfalfa regrowth at the CREC is at ≤ 5 -inch height. Winter rye and winter wheat are in the tillering to jointing growth stages, with most advanced growth and adequate plant densities present where seed was planted into adequate soil moisture last fall. April-planted small grain growth stages range from emerging plants to two-leaf stage. Estimates on planting progress as percent of acres for corn ranges from 70-90% and soybean at 40-60%. April-planted corn should be emerging late this week. Pasture growth is slow. Weeds are becoming more abundant (especially wild buckwheat and common lambsquarters at CREC), including newly emerged foxtail.

While minimum soil temperatures for dry bean germination are the mid 50s, NDSU recommends planting when soil temperatures are consistently in the mid 60s. Typical North Dakota dry bean planting dates range from the last 10 days in May to the first 10 days in June. Six site-years of planting date research conducted by NDSU with pinto, black and navy beans indicated no yield advantage with early planting (before May 20). Research details can be found in the NDSU Extension circular '[Impact of Planting Dates on Dry Edible Bean](#)'.



Corn seedling development on May 10 at CREC with corn planted on April 29

[Greg Endres](#)

Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center

SOUTHWEST ND

Snow and rain have brought some needed moisture to a majority of the region and it soaked into the soil very quickly. According to NDAWN, from May 1st to May 10th Dickinson received 1.14 inch of moisture, Mott 1.36, Hettinger 1.11, Beach 1.03, Dunn 0.68, Bowman 0.47, and Hazen with 0.29 inch. Many were spreading fertilizer ahead of last weekend's moisture. This along with more moisture forecasted has saved a few crops but for some areas, especially with winter annuals and early planted cereals, stand loss has already occurred. More moisture is in the forecast for the region and it is much needed. The welcomed moisture will also increase weed growth - more spraying activity has been noted in the region the past week. Early planted cereals and canola have begun to emerge, flea beetles are present in a trial at the Dickinson REC.

[Ryan Buetow](#)

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NDSU Dickinson Research Extension Center



WEATHER FORECAST

The May 13 to May 19, 2021 Weather Summary and Outlook

Southwestern North Dakota recorded a very welcomed rain this past weekend. It was mixed with snow with several areas seeing an accumulation, but that quickly melted. It was the highest amount of precipitation in many locations since last autumn. It was mainly confined to locations south and west of the Missouri River (Figure 1). That rain/snow over the weekend was the main storm in the past week, meaning, other locations generally recorded little or no moisture.

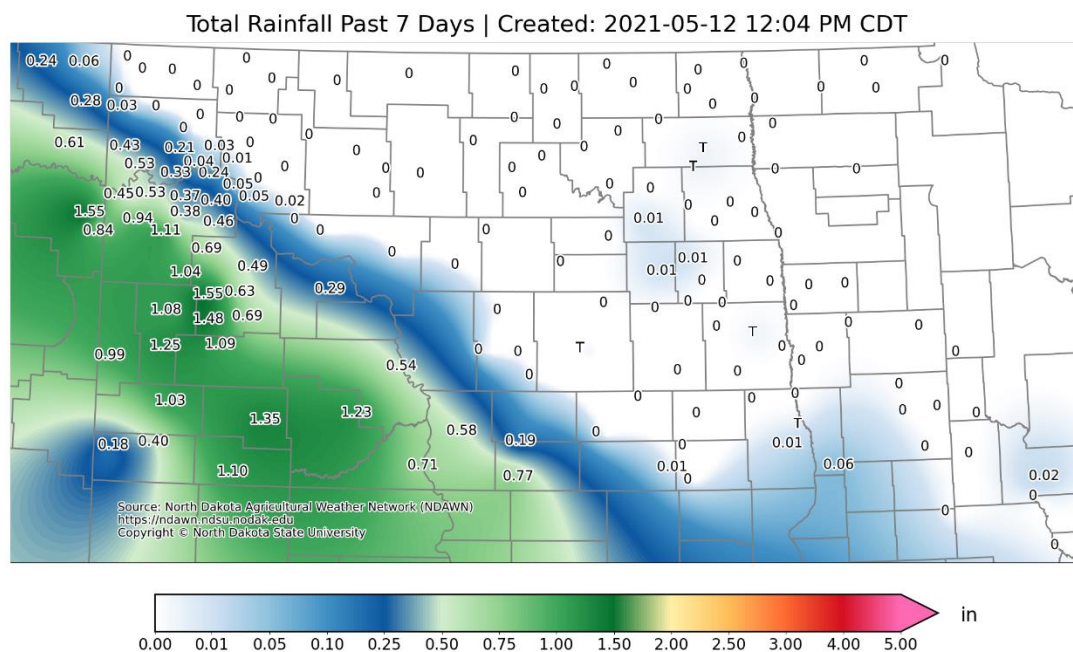


Figure 1. 7 Day (168 hours) Rain Totals at NDAWN station through 12:00 PM, Wednesday,

With the previous mention of snow, it would surprise no one that the past week was a cold week. Temperatures were as much as 12° below average during the period from May 5 through May 11, 2021 (Figure 2). In addition, there was freezing temperatures recorded on several mornings. My strong suspicion is we will still have to worry about another day or more with freezing or near freezing temperatures, but outside of a few areas this morning (Thursday), the next week appears to be frost/freeze free.

Not only does this next week look frost free, it also should be a period of consistently above average temperatures. There will be a ridge of high pressure aloft over North Dakota into southcentral Canada for this forecasting period. That is an indication of warmer than average temperatures, but also a period where storms will have problems moving through that ridge. In turn, there may be some scattered showers on occasional, but overall, it appears that most areas will record little precipitation. The main storm track will be to our north and to our south, which of course has been the overall pattern for the past several months. It is a long way out there, but there is a storm in the central Pacific as I write this. That storm is still a week away from the northern plains, but there is a least the possibility that system may end up impacting us toward the middle or end of next week. There was plenty of chatter on social media about the potential of a storm this weekend, I personally don't see much if anything falling from that storm as it looks to be heading to our south. In summation, warm and mostly dry for the next week and we'll see where that Pacific storm tracks next week.

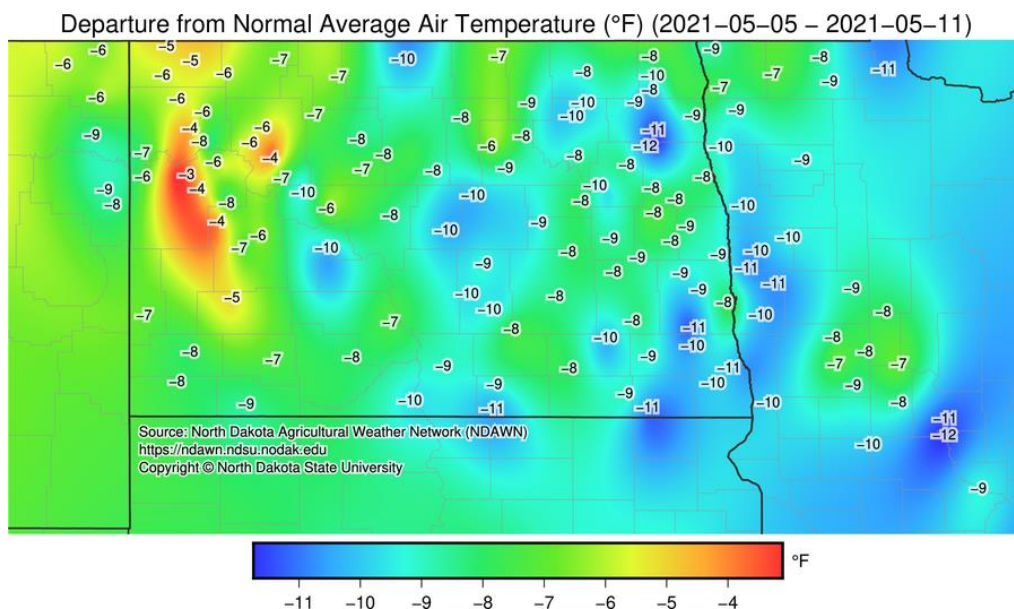


Figure 2. Departure from Average temperature at selected NDAWN weather stations for the period of May 5 through May 11, 2021.

The projected growing degree days (GDDs) base 32°, 44° and 50° for the period of May 13 through May 19, 2021 can be found in Figure 3. This period looks to be by far the warmest continuous stretch this spring and in turn, recording the most heat units.

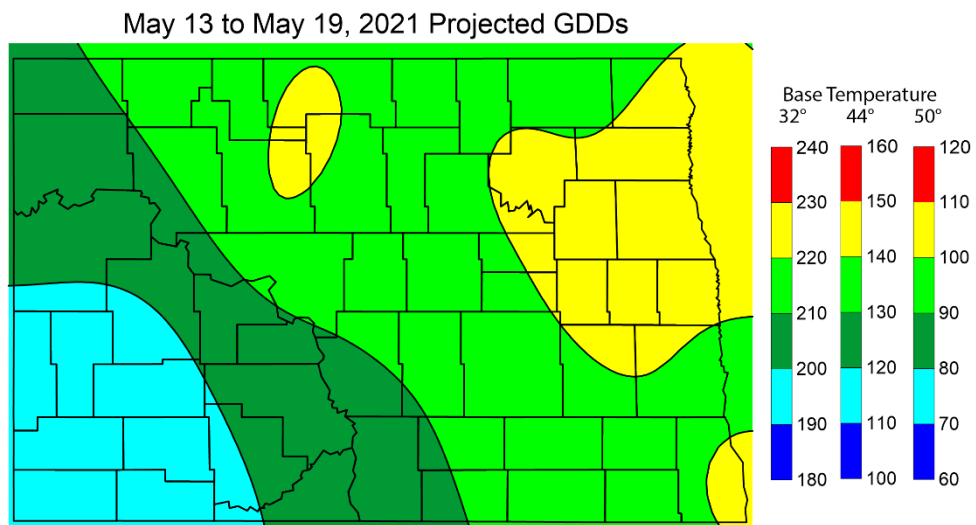


Figure 3. Projected Growing Degree Days, Base 32°, 44° and 50° for the period of May 13 to May 19, 2021

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Meteorologist

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