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# entomology

## PEA LEAF WEEVIL EMERGENCE

As we move into late May, pea leaf weevil (PLW) will likely begin emerging in western areas of North Dakota. PLW adults are greyish brown, around 3/16<sup>th</sup> of an inch long, and recognizable by their broad snout. Adult weevils are similar in appearance to another local weevil, such as the sweet clover weevil, but can be separated by the presence of three light stripes on the thorax that extend onto the wing covers of young PLW adults. PLW is an economic pest of field peas and faba bean. Secondary hosts include clover, dry bean and alfalfa. Adult weevils will feed on these secondary hosts, but the feeding injury by PLW is not economic and they cannot fully develop on these secondary hosts.

PLW was first observed in Golden Valley County, ND during the 2016 growing season, and has since increased its distribution across the field pea growing regions of the state. As of 2019, PLW had been confirmed in 13 western North Dakota counties.

Scouting should begin in tandem with the emergence of field pea or faba bean in the spring, especially as temperatures warm above 63°F. When scouting, it is easier to scout for their feeding injury over the adult weevil. The adult feeding injury causes half-moon leaf notches on the lowest leaves along the field edges. Notches are small and are symmetrical in appearance. This type of injury does not typically result in yield loss as the crop can recover. However, larvae feeding below the soil surface on nitrogen-fixing



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*Adult pea leaf weevil on left (Natasha Wright, Bugwood.org) and adult sweet clover weevil on right (Pest and Diseases Image Library, Bugwood.org)*

bacteria within the root nodules can lead to significant damage. Overall, this can result in poor plant growth and lower crop yields.

Utilizing cultural and chemical integrated pest management (IPM) strategies can help lower the incidence of injury by the PLW. For cultural control, late seeding of field peas by around 10 days can reduce foliar leaf feeding injury as pea emergence is delayed until after peak emergence of PLW. The use of insecticidal seed treatments can also help protect crops. Seed treatments can reduce defoliation from adult weevils, lower egg laying potential, and lower larval feeding on the nitrogen-fixing nodules. Two active ingredients are currently registered in field peas: thiamethoxam (Cruiser Max, Cruiser 5F) and imidacloprid (Dyna-Shield imidacloprid 5, Gaucho 600, and others).

If economic threshold for crop injury is met (30% of plants with half-moon shaped notches between the seedling and 6<sup>th</sup> node stage), a foliar insecticide treatment may be warranted. However, control timing can be difficult as foliar insecticides should be applied before the female PLW has the opportunity to lay eggs. More information on the PLW can be found by searching for the [Integrated Pest Management of Pea Leaf Weevil in North Dakota E1879](#) NDSU Extension publication or the [North Dakota Field Crop Insect Management Guide E1143 \(revised\)](#).



*Leaf-feeding notches from adult  
(Patrick Beauzay)*

#### CONTINUE TO SCOUT FOR CANOLA FLEA BEETLE

With warmer temperatures occurring in most of North Dakota, flea beetles will be more active in areas with emerged canola fields. Flea beetles and feeding injury to young canola fields have been reported by Ryan Buetow at the Dickinson REC, Lesley Lubenow at the Langdon REC and Steve Zwinger at the Carrington REC. Populations have remained low at the North Central REC site likely due to cooler overnight lows last week and cooler high temperatures of the weekend. Warm and dry weather can promote flea beetle flight and feeding activity. However, a brief cool down (forecasted 50-60s F) with some precipitation chances may slow their feeding and movements into canola fields before warming up towards the end of the week.

Flea beetles overwinter in the adult stage from leaf litter of grassy areas and shelterbelts. Beetles emerge in the spring as temperatures warm to 57-59° F. Flea beetles will feed on weeds (i.e., wild mustard) and volunteer canola before moving into spring planted canola fields. One generation of flea beetles is observed per growing season before adults search out overwintering sites in the fall.

For more information, see the NDSU Extension publication [IPM of the Flea Beetles in Canola E1234 \(revised\)](#) and the flea beetle article in last week's [Crop & Pest Report #4](#).



*Striped flea beetle on canola  
(Patrick Beauzay)*

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## CUTWORM SCOUTING

The first report of cutworms was reported this week in barley in Slope County, southwestern ND (Ryan Buetow, DREC). Newly emerged crops are especially susceptible in the seedling through 4-6 leaf stage to cutworm feeding injury, so weekly/biweekly and routine scouting is important.

Cutworms damage plants in the larval stage (caterpillar) and cause plant injury by cutting stems above or below the soil line, chewing on the foliage and reducing plant stands. Cutworms often will move down a row as they continue to feed on plants.

Evening scouting for cutworm larvae is best, since they feed at night and hide underneath clumps of soil and debris during the day. If you find cut off plants, dig around these plants about two or more inches deep, and search for cutworms. When disturbed, cutworms curl up into a 'C-shape.' Row crops, such as soybean, canola, lentils, field peas and sunflowers, are more susceptible to cutworm damage than small grains, because cut plants do not grow back (grains compensate by tillering).

All cutworm species are lumped together for the action thresholds. If cutworms are at or above the action thresholds listed below for different field crops, then a 'rescue' foliar insecticide application is warranted. An evening application is recommended to target the peak feeding of cutworms at night, but be sure to monitor for temperature inversion and do not spray during an inversion.

- Alfalfa – 4 or more larvae per square foot (new stands – only 2 larvae per square foot)
- Canola – 1 larva per square foot
- Corn - 3-6% of the plants are cut and small larvae (<3/4 inch) present
- Peas / Lentils – 2 to 3 larvae per square meter
- Small grain – 4 to 5 larvae per square foot
- Soybean - 1 larva per 3 feet of row or 20% of plants are cut
- Sugarbeet - 4-5% cutting of seedlings or 3-5 larvae per square foot
- Sunflower - 1 larva per square foot or 25-30% of plants cut



*Dingy cutworm and feeding injury on corn (above) and sunflower (below) (Janet Knodel)*

You can often find both small and large larvae of the same or different cutworm species in a field. If the majority of the larvae are small, <¾ inch, they still have a lot of crop feeding to do before maturity, so an insecticide treatment will be necessary when you are at or above the action threshold. If you are finding a mixture of some small cutworms, many large cutworms and some pupae, it may be too late for a foliar insecticide application since the majority of the larvae are mature (done feeding) and/or pupating (a non-feeding life stage). Remember most cutworms are difficult to kill, so they require the mid- to high labeled rates of an insecticide for effective control. A low rate of insecticide may not provide the kill needed and you may need to respray a field with high densities of cutworms. Another advantage of using the mid- to high labeled rates of insecticides is that you get a longer residual of 7-10 days for most pyrethroid insecticides.

For insecticides registered for cutworm control by field crops, please consult the [2021 North Dakota Field Crop Insect Management Guide E1143](#).

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### FOXTAIL MILLETS FOR HAY

Many areas of North Dakota have been under drought conditions for an extended period. Some livestock owners are starting to wonder about availability of hay for this year. There is an opportunity for crop producers to grow hay as a cash crop for those in need of forage. Livestock owners may also consider some short season millets for hay production.

Foxtail millets are often grown for short season emergency hay crops. Planting of foxtail millets can be delayed until mid-June into July. When used for emergency hay production, late planting is usually encountered. Therefore, anyone making the decision to plant for emergency forage crops, should be checking with seed suppliers as soon as possible.

Plant foxtail millet about  $\frac{3}{4}$  to 1 inch deep. Shallower seeding may be desirable on heavy textured soils with good moisture. Germination is fairly rapid but the seedlings grow slow at the beginning. Foxtail millets in general are poor competitors with weeds. A seeding rate of 10 to 20 pounds per acre is recommended. The higher rates are recommended in eastern North Dakota with the higher rainfall potential. In western North Dakota, 15 pounds is adequate on weed free fields.

There are several hay type millets and they include:

**Siberian millet** has medium-sized stems and possesses some drought tolerance, after it is well established. The seed head is cylindrical,  $\frac{5}{8}$  to  $\frac{3}{4}$  inch in diameter, 4 to 6 inches long, and has purple bristles. It matures in about 75 to 80 days and produces a hay crop in 55 to 60 days.

**German millet** has thicker stems and broader leaves. The seed head is lobed, measuring 1 to  $1\frac{1}{2}$  inches in diameter and 6 to 9 inches long. Bristles are greenish to purple. It is a longer season foxtail, which takes about 90 or more days to mature and 65 to 70 days to produce a hay crop. Because of its increased stem size, it takes more haying management than the other foxtail millets to produce good quality hay.



*Photo: German foxtail millet, Fargo, ND.*

**Table 1. Example of the yield potential of several millet types grown in Fargo and Prosper, ND.**

		Fargo	Prosper	Fargo	Prosper	Fargo	Prosper
		Harvest date				Total Dry matter yield	
Crop	Variety	First harvest	Second harvest			tons/acre	
Japanese millet	Common	3-Aug	4-Aug	8-Sep	14-Sep	3.03	4.67
Pearl millet	PP102M	26-Jul	29-Jul	8-Sep	14-Sep	4.85	5.25
Siberian millet	Manta	20-Jul	19-Jul	8-Sep	.	2.92	3.16
German millet	Golden German	3-Aug	4-Aug	8-Sep	.	3.37	4.00

Cut millets for hay in the late boot to early bloom growth stage. Any delay after full head emergence will reduce quality. Bristles become harder as maturity approaches and may cause sore mouth and eye infections when fed to livestock. Hay protein content is highest when the ratio of leaves to stems is highest. Curing foxtail millet requires attention as light stands tend to sun dry rapidly after cutting, while heavy stands, especially of the German type, cure at a slower rate. If expected yield levels are greater than 1 ½ tons per acre, crimping will help the curing process. Potential yield of foxtail millet hay is influenced by moisture relationships.

Other millets can be grown in North Dakota like forage pearl millet and Japanese millet (Table 1).

Some trial information about millets is available at:

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

Information about several annual forage crops is available at:

<https://www.ag.ndsu.edu/plantsciences/research/forages/annual-forages>

Forage variety trial results is available at: <https://www.ag.ndsu.edu/varietytrials/forages>

[Hans Kandel](#)

Extension Agronomist Broadleaf Crops

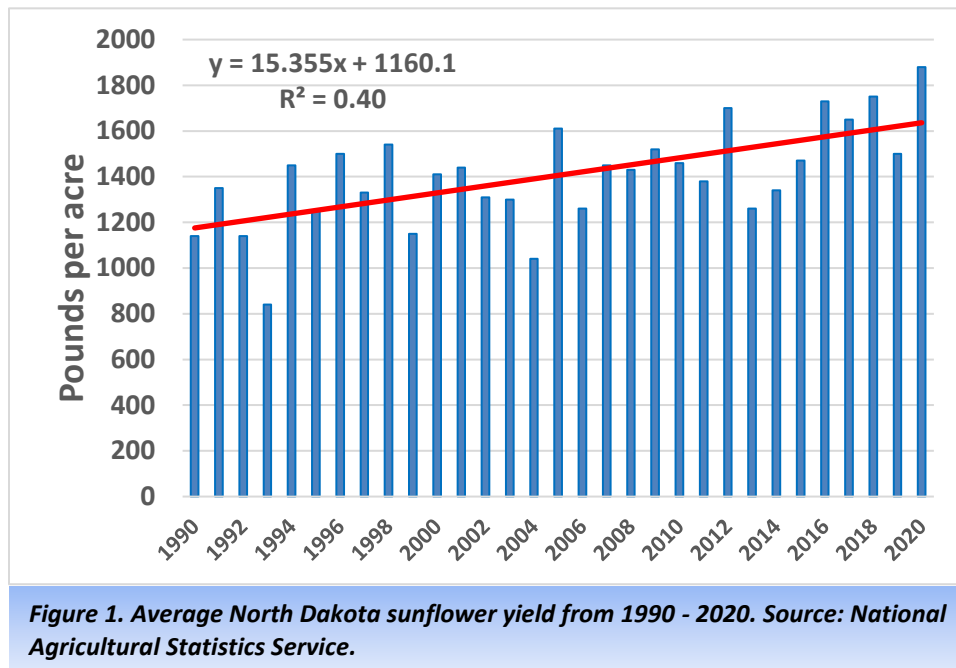
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Professor Forage, Cover Crops, and Biomass

## SUNFLOWER PLANTING

In North Dakota, sunflower planting can extend from mid-May until mid-June. As of May 23<sup>rd</sup> 30% of the sunflower acres in North Dakota were planted. National sunflower surveys indicate that two of the main limiting factors in optimizing sunflower yield are plant spacing within the row, and lower established plant populations than intended. Within row plant spacing irregularities consist of large skips, or areas where plants grow too close together, causing one of the plants not to contribute to sunflower yield. Equal distribution of plants within the row is essential to obtaining maximum sunflower seed yield.

Irregular plant spacing in the row may be due to poor seeding conditions, planting equipment malfunctions, high planting speed, poor seed germination, seedling disease, insect damage, or other factors. Producers should pay close attention to their management and refine their technique while planting sunflower to help maximize yield. Planter calibration and planting speed may be the first steps to reduce skips and get better plant spacing within the row.



Growing conditions during the season will affect yield, oil content, and fatty acid composition. Since 1990, the average on farm sunflower yield has increased by about 15 pounds per acre per year. This increase is due to improved genetics and changes in production management. Paying attention to management details and selecting the best genetics for each field may translate into higher sunflower yields.

Sunflower growth stage and development depend on planting date and the accumulated heat units. The North Dakota Agricultural Weather Network has a model to predict the sunflower growth stages based on location and weather conditions. It can be found at: <http://ndawn.ndsu.nodak.edu/sunflower-growing-degree-days.html>. A good description of the various important sunflower growth stages can be found at: <http://www.ag.ndsu.edu/pubs/plantsci/crops/a1145.pdf>.

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#### MANAGING OF RHIZOCTONIA DAMPING-OFF, CROWN ROT AND ROOT ROT OF SUGARBEET

*Rhizoctonia solani* causes Rhizoctonia damping-off and root rot diseases of sugarbeet. These diseases are soil borne and once present in a field can be a problem for many years. Damping-off results in death of seedlings especially when soil temperature and moisture are high at planting. Crown rot typically results in death of plants and root rot may also result in death or significant reduction in root yield of unthrifty plants. Crown rot occurs when infected soil gets into the crown of plants after a heavy rainfall event or through cultivation. Infection of roots occur when soil temperature becomes favorable (>62 F) but symptoms are not observed until the plants ability to absorb moisture and nutrients become comprised resulting in wilting. Growers at some cooperatives have to destroy fields with more than 50%



incidence of Rhizoctonia root rot since infected roots do not store well in long term storage. Crop rotation with non-host crops, use of resistant varieties, and fungicides used as seed treatments and applied so that they target the pathogen in the soil are strategies used to manage the disease.

In infected seedlings, there is wilting followed by death because of infection of the hypocotyl at the soil line (Figure 1). In older plants, the most common symptom is wilting of the leaves, starting with the oldest leaves (Figure 2). Leaves may or may not become yellow. Severely infected plants typically become desiccated and withered before harvest (Figure 3). Some infected plants may survive but damaged roots will be of lower quality. Root rot infections typically starts at or just below the soil line, and sometimes lower on the tap root (Figure 4). Rotations with crops, such as wheat and barley, which are not host of *R. solani* AG 2-2 IIIB or AG 2-2 IV, will help to reduce the amount of inoculum in the soil. Since the pathogen is more severe in wet conditions, draining and leveling of fields with help in disease management. Fields with a history of Rhizoctonia crown and root rot should be planted to a variety with good disease resistance. The fungicides azoxystrobin (Quadris or AZteroid) or Priaxor at labeled rates, applied in a 7 inch band before infection takes place provide effective disease control. It is best to apply fungicides when plants are at the 4-6 leaf stage and before they close rows so that the fungicide gets into the soil and close to the roots to prevent infection. Timing application just before a rain event, or before a scheduled irrigation where this is available, will help to get the fungicide in a position to protect the roots.



**Figure 1. Damping-off of seedlings with infection of the hypocotyl just below the soil level.**



**Figure 2. Wilting of oldest leaves first and some yellowing of leaves of plants infected with *R. solani*.**



**Figure 3. Foliage of infected plants become dry and withered in August and September.**



**Figure 4. Rhizoctonia root infection on the lower part of the root.**

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### STRIPE RUST SITUATION IN THE USA

Stripe rust prevalence and distribution in the USA is starting to increase with fairly high levels in Kansas and Nebraska. Last week, stripe rust was confirmed along the Minnesota-South Dakota border (Jared Goplen – UMN Extension Crops Educator). As a reminder, the stripe rust pathogen overwinters in the southern USA and is dependent on southerly winds to carry spores into the Northern Great Plains. Stripe rust is generally considered a cool-season rust preferring temperatures between 50 to 64°F and only requiring six hours of free leaf moisture (dew or rain) to cause infection on wheat leaves. However, a new population of the pathogen is now better adapted to warmer temperatures.

It is likely spores have landed in North Dakota, but it is unclear if any infections have occurred. Winter wheat fields or fairly advanced spring wheat fields are at greatest risk for stripe rust detection. When scouting for stripe rust at this point in the growing season, look in the lower canopy and look for “segments” of leaf tissue with yellow to orange pustules (Figure 1). Once/if stripe rust is detected in North Dakota, management information will be presented in upcoming Crop and Pest Reports.



*Figure 1. Yellow to orange stripe rust pustules appearing on the lowest leaves of hard red spring wheat. Note that the infected area appears as a segment when found on wheat in the tillering growth stages.*

### SELECTING A FUNGICIDE FOR EARLY-SEASON WHEAT DISEASES

The decision to tank mix a fungicide with an early season herbicide will be occurring soon. The diseases targeted by this fungicide application are fungal leaf spots, including tan spot (primarily), *Stagonospora nodorum* blotch and *Septoria tritici* blotch. There are several very good to excellent fungicides that can be used to manage fungal leaf spots and efficacy information can be found in the [NCERA-184 fungicide efficacy table](#). As a reminder, a fungicide will only protect leaves that are available at the time of application, and any “new” leaves will be left unprotected. If you are



interested in the phytomobility of a fungicide (movement in plant tissues), please review the information in a recently published Crop Protection Network Web Book: [Fungicide Use in Field Crops](#).

Wheat producers may also be asking the question if an early-season fungicide is necessary this year due to perceived low disease risk? Research data on early season fungicides in different disease risk environments suggest that the yield response observed in a low disease risk environment is 0.1%, and 3% for a moderate disease risk environment. For these studies, a low disease risk environment was defined as a susceptible wheat variety seeded after a cultivated broadleaf crop with infrequent periods of moisture/dew. A moderate disease risk was defined as seeding a susceptible wheat variety into cultivated wheat ground, with cool weather and sporadic moisture/dew events. Currently, I would consider most of the state in low to moderate fungal leaf spot risk, and yield expectations from an early season fungicide will be modest, especially if a moderately resistant variety (score of 2 to 4 in HRSW guide) was seeded. However, conditions can change quickly and the NDSU Small Grain Disease Forecasting Model can be used to help estimate fungal leaf spot risk.

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#### **SURFACE UREA- SOME GOOD NEWS, AND SOME NOT SO MUCH**

A great deal of urea was applied to the soil surface in North Dakota and the region this spring. A good portion of this was applied over a month ago. Most areas, except in Richland and parts of Sargent counties in North Dakota received very little rain during this period. This weekend, all NDAWN stations received rain from ¼ inch to nearly 5 inches across the state. From the time that the urea was applied, the soil has been so dry that no water movement of urea to urease or urease to urea was possible. If the soil stayed in place, as it did for no-till fields, those fields with cover crop, winter cereals or significant residue, the urea was urea all through the dry month and the rain we just experienced likely moved it into the soil, resulting in little if any loss of N.

In fields without cover, and particularly fields that were rolled, soil has been eroded from the surface by wind in several events; the most recent event happening on May 24 and particularly on May 25. There are reports in some areas that wind erosion has been so severe that seeds placed in the ground over an inch in depth are now exposed directly to the air. That means that in many fields at least part of the field experienced serious surface soil loss from these repeated high-wind periods amounting to an inch or more loss. With the surface soil blown away, any surface-applied fertilizer went with it. Some of the coarser particles went to neighboring fields or into the ditch, fence-row, tree-rows, or riparian areas around rivers, streams, ponds, lakes. The finer particles have moved and are currently (7PM May 25) moving in a very long journey hundreds or thousands of miles away; wherever the upper air currents take them.

The good news is that fields with residue probably have the surface N and other nutrients that were applied. The not-very-good-news is that at least parts of fields where significant wind erosion has occurred have also lost their N and any other nutrients that were surface-applied. These fields will need to be monitored closely during the next month or so, and paired plant analysis from areas of green foliage compared to those without as green a foliage should be obtained to determine if supplemental N needs to be applied, and to which areas of the field it will be needed. If yellow/green differences in foliage are present, then drone imagery, satellite imagery, or active-ground sensors will help determine what areas will be in need, and which are not.

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### DICAMBA MIXING ORDER FOR XTEND SOYBEANS

Recently, my colleagues in the southern US have reported some issues on the commercial level when spray applicators are mixing dicamba formulations approved for use in Xtend soybean, glyphosate, and Sentris (a Volatility Reducing Agent/pH Modifier). The University of Arkansas recently wrote an article about this issue and described excessive build up of foam and pressure in inductor tanks when mixing these products together. They were able to replicate this issue in jar tests as well (Article found here: <https://arkansascrops.uada.edu/posts/weeds/sentris-glyphosate-tank-mix-compatibility-problems.aspx>)

It appears that a reaction between a herbicide with low pH (glyphosate) and the VRA with a high pH (Sentris) is causing production of CO<sub>2</sub> that leads to foaming and increased pressure in an enclosed tank (think of your favorite childhood baking soda + vinegar volcano experiment). The adjuvant load in many glyphosate products is likely adding to the amount of foaming observed as well. I decided to try and replicate the jar tests using both tap water and RO water in my lab. The mixtures I tested did indeed create plenty of foam, and some pressure increase, but I was not able to recreate the magnitude of problem that has been reported. I will point out that the level of foam created should be some cause for concern during the mixing process. Most commercial drift reducing agents (DRAs) that are approved for use with dicamba (and in fact are required for dicamba + glyphosate tank-mixes) will help reduce foam, and a defoamer should also be used if needed.

I think the important points for us to consider are to revisit the mixing order of the products. First and foremost, keep in mind that we never want pure products to come in contact with each other. So always make sure to start with plenty of water, allow a product to go into solution before adding the next product, and make sure to flush with plenty of water if using an inductor tank. Keeping our childhood volcano experiment in mind, we are never told to start with half a container of water, then add the vinegar, then the baking soda....it wouldn't be as cool! We get a much better reaction by adding the baking soda directly to vinegar since they are pure products coming into contact with each other, which allows the chemical reaction to occur quickly without a lot of water to buffer any reaction.

Next, I would follow the mixing order recommended by BASF or Bayer (depending on which products you use). Both companies recommend to start with ½ to ¾ of a tank of water, then add the VRA and any defoamer as the next step. The Sentris label does a nice job laying out the tank-mix order for all products you might add in these mixes (<http://www.cdms.net/ldat/ldHR8000.pdf>). Hopefully by taking our time and following the correct mixing order, we will not experience the issues with excessive foaming and pressure buildup that some have seen in the south. Just another new reason to try our best to be patient and follow the steps when mixing during the heart of spray season.

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# diagnostic lab

## ERIOPHYID MITES ON CONIFERS

A recent spruce sample found Eriophyid mites feeding on the discolored needles. Eriophyid mites are in the Order Acari and Family Eriophyidae, and they feed on many deciduous and coniferous (spruce and pine) trees and shrubs. These mites are minute (<1 mm in length), white to yellow, carrot-shaped and have only two pairs of legs located near the head. A dissecting microscope is usually needed to see them. If you can't find the mites, look for the white threadlike cast skins of eriophyid mites giving the plant a fuzzy appearance. These mites like 'cool' springs.



For damage symptoms, this spruce Eriophyid rust mite are vagrants on leaf surfaces causing chlorotic, browning, stunting or red patches on spruce needles/branches. Other species cause bladder galls or distorted flowers and foliage.

If mite populations are known to be high, a dormant oil can be applied in early spring before bud break to suffocate the eggs and any recently hatched mites. Other biorational pesticides are insecticidal soap and abamectin. Synthetic insecticides available include bifenthrin, carbaryl and lambda-cyhalothrin. The best timing for chemical control is 7-10 days before bud break.

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# forestry

## EARLY SEASON DEFOLIATORS ON TREES

We've begun to see the spring defoliators of trees show up this year. Both cankerworms and tent caterpillars have been seen in eastern North Dakota, though we haven't had any reports from elsewhere across the state.

Cankerworms damage was heavy in central North Dakota in 2019 and 2020, but only moderate in the east. This year, cankerworms have been reported in Grand Forks County, but not elsewhere. The damage caused by cankerworms is stressful on trees; when added to drought stress, some trees may be damaged so much that they can't recover. However, we're hopeful that the worst of the outbreak occurred in 2020, at least in central North Dakota.



Both the spring cankerworm (*Paleacrita vernata*) and the fall cankerworm (*Alsophila pometaria*) cause damage during early spring. Many common chemical insecticides are effective against young larvae, and the bio-pesticide *Bt* works well for especially young larvae (<10 days old). Older larvae are harder to control. For more detailed information about cankerworms, see NDSU Extension publication [Cankerworms in North Dakota \(E999\)](#).

Tent caterpillars have also begun to show up in eastern North Dakota. Three tent caterpillars occur in North Dakota – eastern tent caterpillar (*Malacosoma americanum*), forest tent caterpillar (*M. disstria*) and the prairie tent caterpillar (*M. californicum lutescens*). Both the eastern and prairie tent caterpillars focus on chokecherry and related tree species; forest tent caterpillars have a broader host range.

Both eastern and prairie tent caterpillars build ‘tents’ – easily visible nests where they congregate and feed. Forest tent caterpillars don’t actually build tents.

Control measures for all the tent caterpillar are the same. For small infestations, the larvae can easily be picked off the tree and destroyed. The bacterial-based pesticide *Bacillus thuringiensis* var. *kurstaki* (Btk) works well to control young larvae, while pyrethrins or synthetic insecticides are needed for older larvae.

Additional insecticides available to homeowners include: acephate (Orthene), azadiracthin (Azatin), carbaryl (Sevin), esfenvalerate (Bug-B-Gon), malathion, permethrin, spinosad (Conserve), or other insecticides registered for trees.

Don’t use a blowtorch to destroy the caterpillar nest. While effective, the tree will also be damaged.



**Fall cankerworm larva feeding on an American elm leaf.**



**Forest tent caterpillar feeding on a rose bush. These insects don’t actually produce tents but instead form large masses of larvae that congregate together on tree stems. The keyhole-shaped markings on the back are the key identifier for forest tent caterpillars.**

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## around the state

### AROUND THE STATE

#### NORTH CENTRAL ND

North Central North Dakota (finally) received a good amount of rainfall over the weekend across the region, however, some regions would have liked to receive more. Showers were pretty hit-and-miss across the area. The rainfall observed was crucial for the development of the crops already planted. Planting activity is ongoing in the region and will likely finish in the days to come. Here are some quick precipitation reports as observed by area NDAWN stations over the last week (beginning May 18<sup>th</sup>): Minot: 0.79"; Bottineau: 0.31"; Garrison: 0.67"; Karlsruhe: 0.65"; Mohall: 0.48"; Plaza: 0.69"; and Rugby: 1.05". Additionally, the bare soil temperature at the NCREC is observed at 61 degrees F.

As of May 24<sup>th</sup>, the NCREC agronomy teams hope to wrap up planting this week with some sunflower, dry bean, and buckwheat still to be planted. Weed control measures continue when the wind allows it as it has been breezy over the past weekend. Pennycress, mustards, and kochia are some of the weeds that are being observed.

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#### NORTHEAST ND

Producers in Northeast ND were very concerned with severe dry conditions early part of last week, but the weekend showers alleviated some of those concerns. The amount of precipitation received ranged from a high of 2.33 inches to a low of 0.33 inches with some isolated areas receiving none. Small grain plantings are mostly done and many of the fields are greening up with seedlings at 2-3 leaf stage. Emergence is sporadic with good stands in low areas with moisture and patchy in dry and high land areas. Rumors are heard of farmers contemplating going into planted wheat ground and seed soybeans if rain comes and spray out the wheat. Soybean seed could be in short supply. There was a big rush to get fertility and canola/soybean plantings done prior to the forecast of the rain. Plantings of sugar beets, flax, dry beans, and sunflowers varies with some being done and others going in after the rain. Corn fields are emerging. Pastures and hay crop have suffered the most due to drought conditions. Livestock producers are forced to liquidate their cattle to reduce the herds due to shortages of feed and water. Producers continue to haul water to livestock as the quantity and quality of the water in the dug outs is deteriorating.

[Anitha Chirumamilla](#)

Ext Agent/Cavalier County



**Figure 1. Spring wheat conditions in the north central region.**



**NORTHWEST ND**

The Northwest got some very badly needed rain late last week and over the weekend. Precipitation totals for the past 4 days ranged from 1-3" with most places receiving 1.5-2" over 2 or 3 days. Most farmers finished planting prior to the rain, though I heard of some who quit early last week and were going to wait and see if it rained before continuing planting. Early planted crops are showing very uneven emergence due to the dry conditions, but this rain should help even things out a bit. For later planted crops that had not emerged yet, which it seems like most hadn't, the rain should get them out of the ground more evenly. This rain has given us hope for a crop, but more will be needed to keep things on track.

The rain will also stimulate weed germination and I anticipate farmers will start their spray season in earnest this week. Multiple producers I spoke with did not do their typical burndown prior to planting in April or May because there were no weeds emerged at that time, it was that dry! But now, I expect weeds will get up and go and spraying prior to crop emergence will need to happen quickly for PRE's.

Looking at the forecast, high temperatures will be in the 60's most of the week and warm up to the 70's over the weekend into early next week. Currently, there are no strong chances of rain in the 7 day forecast.

[Clair Keene](#)

Extension Cropping Systems Specialist  
NDSU Williston Research Extension Center

**SOUTH-CENTRAL/SOUTHEAST ND**

According to NDAWN, the region's total rainfall during May 1 through 24 ranged from 0.4 inch (Dazey) to 5.7 inches (Jamestown), and the Carrington Research Extension Center (CREC) received 1.3 inches. The rain during the past week aided small grain stands, and improved soil conditions for establishing corn and soybean, or to finish planting row crops including dry bean and sunflower. Unfortunately, the high winds of May 24-25 quickly evaporated moisture and caused considerable erosion from bare topsoil, especially rolled ground.

Alfalfa regrowth at the CREC is at  $\leq 12$ -inch height and flower buds are present. Winter rye with advanced growth is heading. Spring-planted small grain are tillering, with most advanced fields nearing the jointing stage. The short-term forecast for cool weather will help maintain yield potential by promoting tiller growth and main stem head size. Corn may have had more variable plant emergence periods but generally adequate stands. Soybean planting is near completion while very few dry bean and sunflower acres should be left to be planted after Memorial Day.

**CROP MANAGEMENT FIELD SCHOOL**

NDSU Extension's annual crop management field school will be conducted on June 10 at the CREC. Field sessions include:

- \* Weed identification - identify about 60 living weed exhibits, plus receive brief reviews on selected weed biology and control

- \* Herbicide site-of-action - identify herbicide classes by examining crop and weed injury symptoms

- \* Late-season wheat disease management - review crop stages and disease identification, plus the most effective use of fungicides to protect wheat seed yield and quality



*Wheat disease management session during 2019 field school.*



\* Low and high soil pH – challenges and management strategies

Preregistration is required, and 50 participants will be accepted on a first-come, first-served basis. Certified crop advisers will receive 4 continuing education units in crop pest and soil management.

For more details and preregistration information, visit <https://www.ag.ndsu.edu/CarringtonREC/events> or contact the CREC at 701-652-2951. A completed preregistration form and \$100 fee is required by June 4.

[Greg Endres](#)

Extension Cropping Systems Specialist  
NDSU Carrington Research Extension Center

## **SOUTHWEST ND**

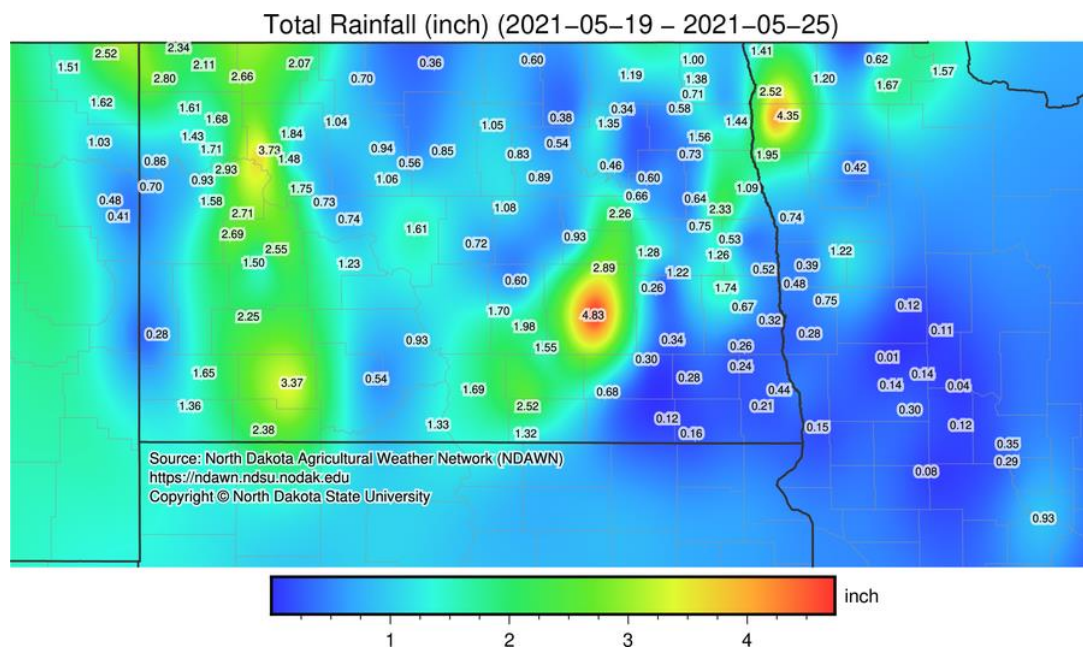
The average rainfall for the past several months fell all at once for some in the southwest region over the past weekend. According to NDAWN from May 20<sup>th</sup> to May 25<sup>th</sup> Dickinson received 2.25 inches, Hettinger received 2.38, Mott received 3.37, Bowman 1.36, Amidon 1.65, and Beach with 0.28. There were some pockets that reportedly received 5 inches over a 3 day period. Those that received rain have some washouts and flooded portions of fields. Even with this heavy rainfall, many in the region need more moisture. For those in the Dickinson area we received enough to hold off major agronomic impacts of drought for a few weeks, but for winter annuals, perennials, and early seeded small grains there has already been loss or severe stunting of growth. With cold temperatures in the forecast it will be important to scout fields and to understand where the growing point is on the crop along with the crops ability to compensate for stand loss. Frost damage to wheat likely won't need to be replanted due to the growing point being underground, where major frost damage to canola would likely call for a replant decision. Average bare soil temperatures according to NDAWN have been in the 50s for the past few days.

[Ryan Buetow](#)

Extension Cropping Systems Specialist  
NDSU Dickinson Research Extension Center

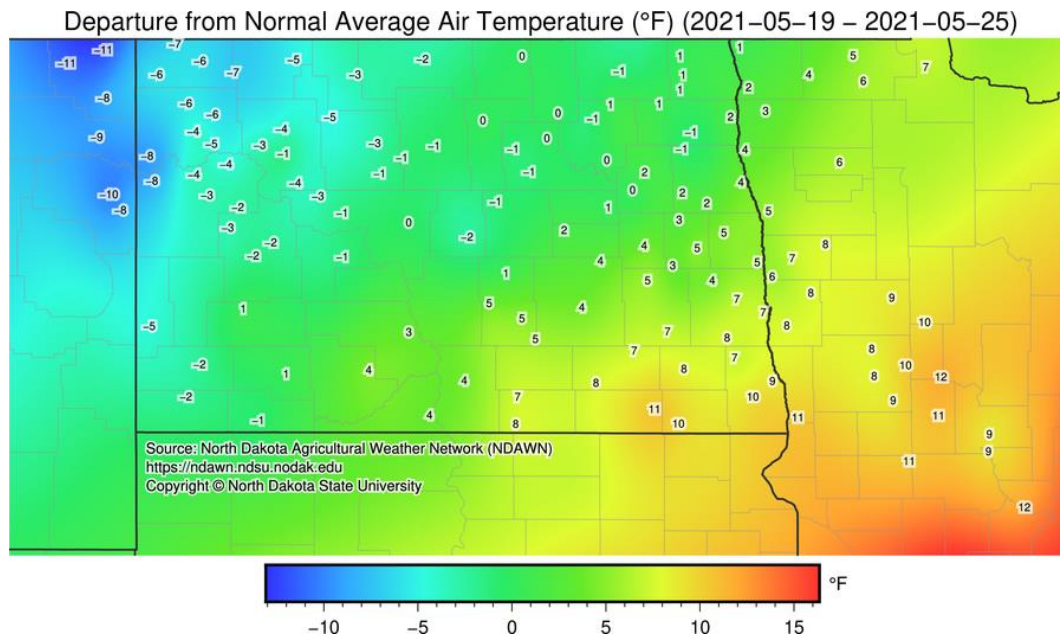
**WEATHER FORECAST****The May 20 to May 26, 2021 Weather Summary and Outlook**

This past week was by far the rainiest week of the season. There were several areas that recorded between 3 to 5 inches of rain in the last 7 days (Figure 1). The rain did not fall evenly, it never does, but many locations got a very beneficial rain with a few spots recording too much of a good thing. The southern one-third of North Dakota was expected to get rain overnight into this morning (Thursday) but beginning now through next week, it appears our dry pattern is coming back.



**Figure 1. Total rain at selected NDAWN stations from May 19 through May 25, 2021**

Northern North Dakota recorded several cloudy cool days in the past week, keeping temperature at or even well below average in the past week (Figure 2). This period is also starting colder than average meaning few growing degree days for the next few days, but next week looks much warmer.

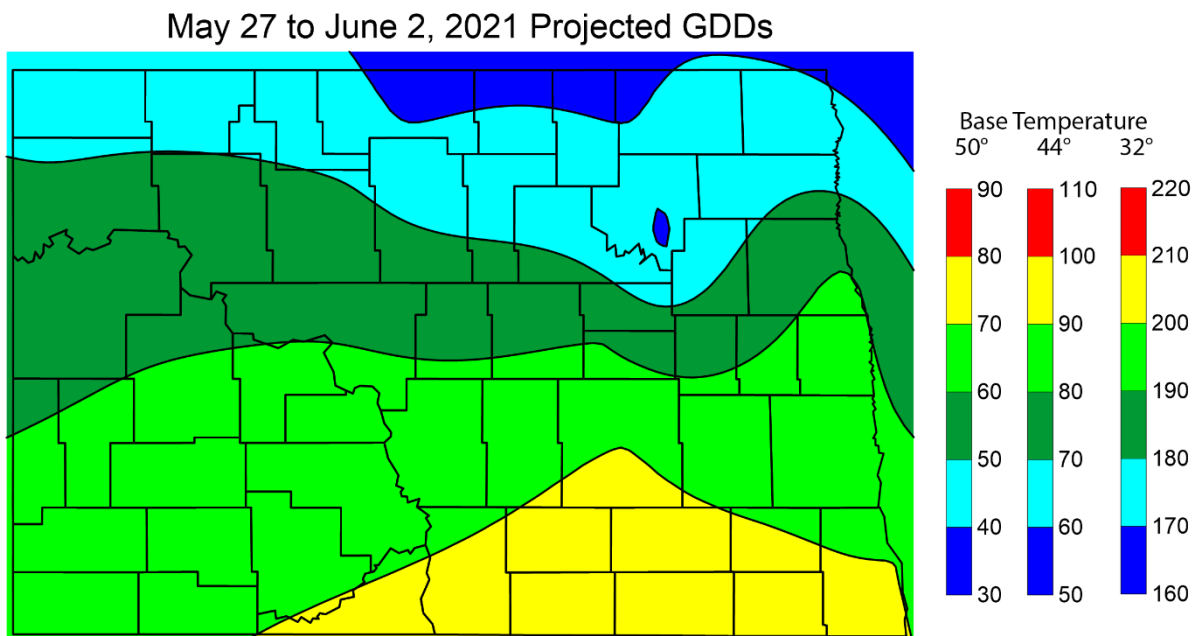


**Figure 2. Departure from Average temperature at selected NDAWN weather stations for the period of May 19 through May 25, 2021.**

There was either a frost (36°) or a freeze (32°) yesterday (Wednesday) and it was expected in some locations again today (Thursday). It appears there will another threat of a frost or freeze on Friday morning as well. If the sky clears, the freezing temperatures may be much more widespread then the past couple of mornings. After we get past Friday, a slow warm up will begin and hopefully no more freezing temperature potential for the rest of this forecasting period. As hinted to already, it appears we will be heading back into a dry pattern. There should be some hit and miss showers or thunderstorms on Saturday as a weak cool front moves across the northern plains. I'm sure there will be a day or two with at least some spotty moisture, but another widespread event seems unlikely for the next 7 days.

The projected growing degree days (GDDs) base 50°, 44° and 32° for the period of May 27 through June 2, 2021 can be found in Figure 3. Most of the growing degree days this period will come next week.

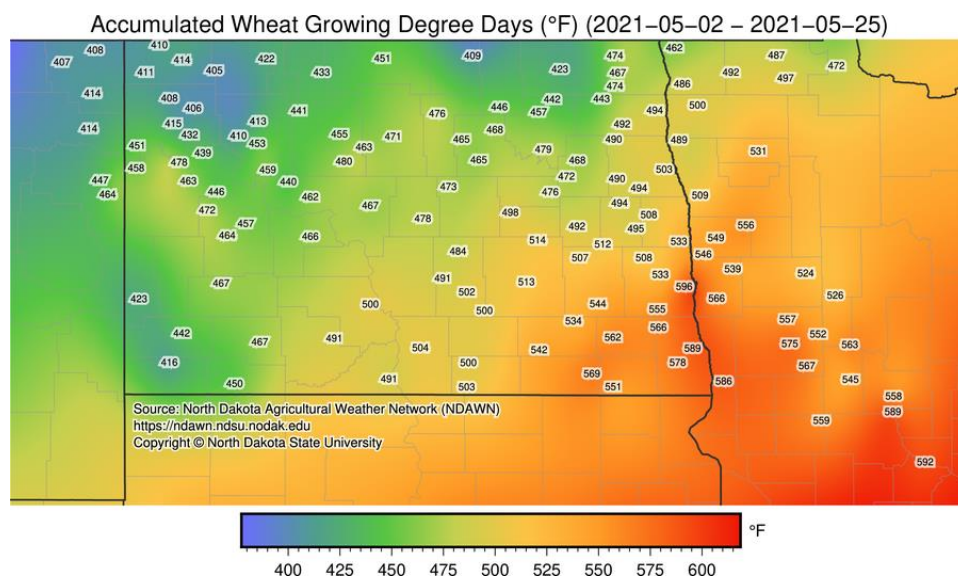




**Figure 3. Projected Growing Degree Days, Base 32°, 44° and 50° for the period of May 27 to June 3, 2021**

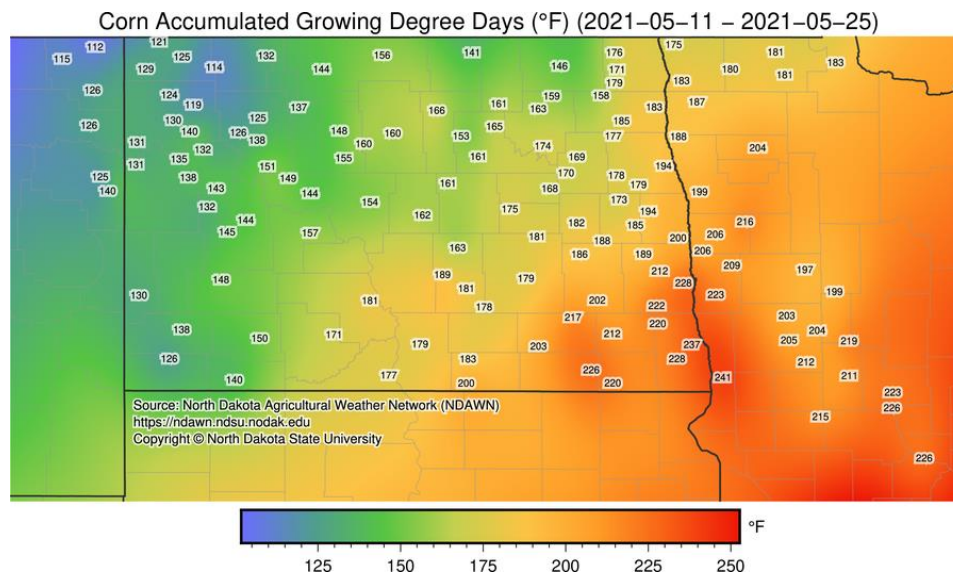
Using May 1 as a planting date, accumulated growing degree days for wheat (base temperature 32°) is given in Figure 4. You can calculate wheat growing degree days based on your exact planting date(s) here:

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



**Figure 4. Accumulated Growing Degree Days for Wheat (Base 32°) since May 1, 2021**

Using May 10 as a planting date, accumulated growing degree days for corn (base temperature 50°) is given in Figure 5. 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 5. 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>

[Daryl Ritchison](#)

Meteorologist

Director of the North Dakota Agricultural Weather Network

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