Prevented Planting Economics

North Dakota crop planting progress as of May 27 was ahead of average but behind last year for nearly every crop. For example soybean planting was 72 percent complete, compared to 79 percent last year and the 61 percent five year average. However, each year there are some prevented planting acres due to wet soil conditions.

The USDA Risk Management Agency has final planting dates by crop for each county. For example, June 10 is the final planting date in North Dakota for soybeans, dry edible beans and flax. For spring wheat, durum and barley, it is May 31, except for the northern one-third of the state, where it is June 5.

Producers may be eligible to receive a prevented planting insurance indemnity payment if planting cannot be achieved due to weather by the final planting date. Acreage on which a prevented planting indemnity payment is received is subject to certain restrictions for the remainder of the crop year.

The producer can choose to plant the crop after its final planting date but the insurance revenue or yield guarantee for most crops is reduced 1 percent per day for the first 25 days of “late planting” after the final planting date. The insurance guarantee is reduced 1 percent per day for just a 15 day late planting period for field pea and lentil. For canola it is reduced 1 percent per day for days 1-5, and 2 percent per day for days 6-15. Crop insurance is not available after the late planting period.

NDSU Extension has developed a spreadsheet to help with the decision of whether to plant the crop after the final planting date and accept the risk of lower yields and reduced crop insurance coverage or to collect a prevented-planting crop insurance indemnity payment and idle the ground.

The program uses partial budgeting to compare the economics of prevented planting with growing the same crop for which a prevented-planting payment could be received or some other crop.

The prevented-planting indemnity is offset partially by the direct costs, such as cover crop seed, chemicals and fuel, to maintain the land that will not be used for crop production in 2018. This is compared with the income that could be obtained from growing the crop after the direct costs of production have been subtracted.

Two critical assumptions are the expected yield and market price if the crop is seeded late. Producers run the risk of lower yields and quality. The analysis also considers crop insurance indemnities, which may be received if a producer plants the crop late and yields suffer.

Crop insurance coverage level only diminishes 1 percent per day for the first several days after the date when producers can choose prevented planting.
Therefore a producer still can plant a few days late and have a fairly strong safety net and have the upside revenue potential if better than expected yields and market prices exist.

There are other considerations in the prevented-planting decision. Planting will use up soil moisture and lessen the possibility the ground will be too wet for seeding next year. Another reason to plant may be to satisfy a forward sales contract. However, late planting may result in lower yields and lower the actual production history, which is used to calculate future crop insurance guarantees.

If soil conditions do not allow seeding by the prevented-planting date, producers can analyze the prevented-planting option and should consult an insurance agent if unsure whether the acreage qualifies, what the payment rates may be and other details.

Andrew Swenson
Extension Farm Management Specialist

IPM SURVEY UNDERWAY

Six scouts were hired for the 2018 Integrated Pest Management (IPM) Survey in field crops of North Dakota! IPM Training was conducted for the scouts on May 23rd at the Carrington REC. Field scouts will survey for major diseases and insect pests on four crops including wheat, barley, sunflower and soybean. The purpose of the survey program is to monitor for economic pests that negatively affect crop yields. Timely pest alerts are provided for producers, crop consultants and agronomists to assist with pest management. GPS coordinates are recorded with pest data, and ArcView maps will be created to show incidence and severity of pests in North Dakota.

Maps are posted weekly on the NDSU IPM web page (usually by Wednesday of each week). Important pest activity will be summarized for the NDSU Extension Crop and Pest Report and other social media.

Greg Endres teaching scouts how to identify crop and growth stage at the NDSU IPM Scout Training held on May 23rd at Carrington Research Extension Center. (Courtesy of A. Friskop, NDSU)
The NDSU IPM scouts are:

- **Brittney Aasand**, central and south central counties, working out of Carrington REC with Greg Endres
- **Marc Michaelson**, southwest and west central counties, working out of Dickinson REC with Ryan Buetow
- **Caleb Cross**, north central counties, working out of NCREC in Minot with Travis Prochaska
- **Scott Roseth**, northwest counties, working out of Williston REC with Audrey Kalil
- **Dan Kraemer & Stafford Thompson**, southeast and east central counties, working out of NDSU campus, Fargo with Jan Knodel, Andrew Friskop and Sam Markell.
- **Kaylee Anderson**, northeast counties, working out of Langdon REC with Leslie Lubenow and Benson County Extension Office with Scott Knoke

**IPM Scouting Areas by REC**

University of Minnesota Extension, Dr. Philip Glogoza, coordinates the IPM Survey in soybeans for Minnesota. Their scouts are located in Moorhead and Morris.

This work is supported in part by the Crop Protection and Pest Management Program [grant no. 2017-70006-27144] from the USDA National Institute of Food and Agriculture, and the North Dakota Department of Agriculture.

*Janet J. Knodel*
Extension Entomologist

*Andrew Friskop*
Extension Plant Pathologist
SUGARBEET ROOT MAGGOT: HOT WEATHER HAS UNLEASHED MANY FLIES EARLY!

Unseasonably high temperatures during the past several days have resulted in exceptionally early and unusually high sugarbeet root maggot (SBRM) fly activity at several locations throughout the Red River Valley (RRV). The high activity we have recorded on sticky-stake traps in the central and northern Valley thus far have not been seen at such an early point in the growing season in well over 20 years of monitoring! The photo below, taken on Friday, May 25, is of one of our traps in South St. Thomas Township (TWP), ND (Figure 1). As a point of reference, we usually see the very first fly or two of the season by that date.

**Latest root maggot fly counts.** SBRM fly activity is being monitored at 37 sites throughout the RRV by NDSU research and Extension personnel, as well as agriculturists from American Crystal Sugar Company and the MinnDak Farmers Cooperative. Fly counts (totals from 2 stakes per field) are posted online [here](http://www.ndsu.edu/entomology/people/faculty/boetel/flycounts/) for each location on a same-day basis every Monday, Wednesday, and Friday.

Current hotspots include Auburn, Grand Forks/East Grand Forks (Sullivan & Walle TWPs), St. Thomas, and Thompson. Moderately high activity is also occurring in the vicinity of Bathgate, Buxton, Cavalier, Crookston, Crystal, Drayton, and ReynoldsCavalier, Minto, and Thompson, ND. Other areas could also develop relatively high infestations as well. As such, growers in SBRM risk areas should be ready to apply additive postemergence insecticide applications if fly activity in their areas increases to at least 45 flies per sticky stake or 0.5 flies per plant within a field. Fly counts from the NDSU trapping network can be viewed online at: [http://www.ndsu.edu/entomology/people/faculty/boetel/flycounts/](http://www.ndsu.edu/entomology/people/faculty/boetel/flycounts/).

The current forecast of anticipated peak fly activity dates for four representative RRV locations is presented in Table 1. Peak fly activity typically coincides with the first rain-free, warm (about 80°F), low-wind (< 10 mph) day at the accumulation of 650 degree-day (DD) units. Extremely high activity is expected to continue into next week. By the time this report is published, fly activity will likely have peaked in the southern Valley, although low infestation levels are expected in this part of the growing area. Activity in the central RRV is expected to peak between the June 2 and 5, and peaks in the northern Valley are anticipated to occur around June 6. However, in light of this seemingly unprecedented timing and intensity of fly activity at this point in the growing season, it is impossible to know how long flies will persist. Therefore, growers and crop advisors should carefully monitor this situation for the next few weeks.
Concerns. The early fly emergence and flight activity are somewhat alarming, because most sugarbeet plants within the insect’s range will be atypically small when SBRM larvae begin feeding. On the positive side, fields that were treated with a planting-time granular insecticide will likely have a good base of protection because most of the active ingredient from those applications should be present when larval feeding injury begins. Conversely, these early infestations could be especially damaging in fields that were not treated with a planting-time insecticide, because plants are still quite small at this point within the growing season. This underscores the need to be vigilant about monitoring fly activity within individual fields. It also suggests that growers in affected areas should be prepared to make postemergence rescue insecticide applications, especially if fields were planted under any of the following SBRM management approaches: 1) no at-plant insecticide; 2) a granular insecticide at a low to moderate rate; 3) a planting-time liquid insecticide; or 4) an insecticidal seed treatment.

Postemergence SBRM Control. Growers in high-risk areas for damaging SBRM infestations, or especially those that observe high fly activity in their fields, should plan on applying a postemergence insecticide for additive protection, especially if their insect management program involved any of the above-mentioned scenarios. Fields in which heavy rainfalls (≥ 3 inches) occurred within two to three days after at-plant or postemergence insecticides were applied also may need additional postemergence protection.

Postemergence insecticide options for root maggot control include both granular and sprayable liquid formulations. Postemergence granular insecticides perform best if applied at least five days ahead of anticipated peak fly activity, but work just as well if applied over two weeks ahead of peak fly. Sprayable liquid insecticide applications, which can either be applied by ground-based equipment or aircraft, perform best if applied close to (within 2-3 days of peak fly; either on, before or after peak). Treated fields should be monitored closely after a postemergence application to determine if fly activity resurges. Some fields could require retreatment if subsequent infestations reach or exceed 0.5 flies per plant.

IMPORTANT: If a chlorpyrifos-containing liquid spray (e.g., Lorsban 4E, Lorsban Advanced, or any generic chlorpyrifos product) is applied, 10 days must pass before another chlorpyrifos liquid can be made to the same field. If retreatment is necessary within 10 days of the initial chlorpyrifos application, an insecticide containing a different active ingredient must be used. For more information, consult the “Insect Control” section of this year’s Sugarbeet Production Guide. Always remember to READ, UNDERSTAND, and FOLLOW the label of your insecticide product – it’s the law.

Mark Boetel
Research & Extension Entomologist
LAND ROLLING

Land rolling is often used in soybean fields in North Dakota and NW Minnesota, especially in fields with rocks and soil clods or fields with corn stubble. For many years, the practice has been utilized in alfalfa and grass seed production to improve the seed to soil contact, and therefore the improving germination, as well as pushing rocks into the soil. For row crops the main purpose is improve harvesting efficiency and reduce combine damage. Harvesting soybean after rolling often results in cleaner beans by lessening the amount of dirt on the beans. Excess dirt on the beans will potentially attract moisture when stored. Some no-till farmers have seen benefits of using land rollers to deal with excessive corn or other standing residue, while others prefer the standing residue. Rolling a field may also help with the decomposition of the previous crops’ residue especially corn stalks.

Land rolling is the most beneficial when done just after seeding the crop, and rolling may increase the seed to soil contact and improve germination. Rolling just after planting may also result in more runoff after a heavy rain or blowing soil during wind events. It is not recommended to roll soybean or dry bean during the hypocotyl arch stage (VE stage, see graph ‘soybean emergence’) when the crop is just coming out of the ground and the cotyledons are still facing down. The plant can easily break on the top of the “crook”. There are no growing points below the “crook” therefore the plant cannot recover and will die. There is an opportunity to roll soybeans after they emerge, but preferably before the first trifoliolate (V1) growth stage. During these stages, the plants can withstand bruising and can recover from such injuries although a few stems may break or plants may lodge. Damage is less if rolling takes place during the heat of the day when plants are not full of water and crisp.

Source: A-1172 Soybean Production Field Guide
Rolling studies indicated a trend of lower remaining soybean plant population as rolling was delayed from pre-emergence to the second trifoliolate (V2) growth stage. However, seed yield was similar among the unrolled check and all rolling treatments.

Land rolling in North Dakota can also be used for dry bean, pea, lentils and chickpea. Research on dry bean (and upright Pinto) and field pea in Manitoba found that there were no significant differences in plant density and yield between no rolling (the check treatment) and rolling immediately after seeding or rolling after the hypocotyl arch stage, 10-13 days after planting (source: The Pulse Beat magazine).

Conclusions:
- Best time to roll is directly after planting. Plants can be rolled early in their development but not during the “crook” stage (VE).
- Rolling during the warmest part of the day, while plants are less turgid, may reduce potential plant injury.
- High residue levels may protect small plants from damage during post-emergence rolling.
- Plant damage in the wheel tracks (with post-emergence rolling) is likely to be more severe than in the rolled area.
- Although there may be stand losses or damaged plants, the yields at the end of the season tended to be similar between pre-emergence and early post-emergence rolling as remaining plants were able to branch out, and utilize the open space and therefore contributing to yield.
- In certain soil types, there may be a higher risk of sealing or crusting the soil.
- There is an additional cost to own or rent a roller and go over the field with a tractor pulling the roller.
- Harvesting of the crop after rolling is easier and one can potentially drive the combine a little faster.

Resources
a) Carrington, Endres and Henson. 2004, Impact of Field Rolling on Soybean Performance.
c) University of Minnesota Extension, DeJong-Hughes et al., 2012. Management Considerations for Rolling Soybean in the Upper Midwest.

Hans Kandel
Extension Agronomist Broadleaf Crops

EFFECT OF PLANTING DATE ON DAYS TO MATURITY IN CORN

Good planting progress occurred this past week and most of the corn and small grain acres are now planted. Because of the late spring this year, some crops were (or will be) planted late relative to their optimum planting period. Earlier I wrote about the potential yield loss associated with delayed planting. In addition to the effect of late planting on yield, others have expressed interest in knowing the relationship between planting date and days to maturity. In both wheat and corn, there is a predictive relationship between growing degree days (GDD) and maturity. Not surprisingly, later planted small grains take fewer calendar days from planting to maturity than those planted earlier because they accumulate GDD more rapidly earlier in their growing cycle (see article by Jochum Wiersma, University of Minnesota Extension Agronomist, which follows).

The same type of phenomenon exists for corn where the number of calendar days between planting and black layer is fewer in late-planted corn compared to early-planted corn. During early vegetative develop this is easy to visualize as GDDs are minimal in early May compared to those during early June. Corn planted on May 1st, for example, will take 24 days to emerge, while corn planted on June 1st will take 15 days (using normal GDD accumulations for Fargo and assuming that 120 GDDs are needed for emergence). Unlike small grains, however, GDD accumulations start to slow during the latter part of grain filling in corn. This results in late-planted corn taking slightly more calendar days to progress from silking to black layer than early-planted corn. The amount of “catch-up” in development is therefore reduced somewhat. The net result of late-planting, however, is that later planting corn requires fewer calendar days to reach maturity than an early-planted crop. Additionally, research has shown that fewer GDDs are required for late-
planted corn to reach maturity than early-planted corn. It is not clear to me why, but research has shown that a full season hybrid grown in the central Corn Belt needs 150 fewer GDDs to reach maturity when planted in early June than the same hybrid planted in early May (Nielsen et al., 2002, Agronomy Journal 94:549-558). These data are supportive of using hybrids that are slightly later than would be recommended based solely on the GDD requirements to reach maturity when planting is delayed beyond the optimum planting window.

Joel Ransom
Extension Agronomist for Cereal Crops

WILL WHEAT CATCH UP TO THE CALENDAR?

A few weeks ago, I was asked whether the wheat crop would catch up in its growth and development now that planting was delayed compared to the last few years. To explore this question we went back into the NASS crop progress reports between 1990 and 2017 and gleaned the date that seeding commenced, reached the half way mark, and was near completion in Minnesota. We then used those three dates to calculate the heading date using the Fargo NDAWN station.

The three regression lines that resulted from this exercise are shown in the chart. The blue line represents how much quicker the spring wheat cropped reached heading when planting was delayed from April 1st through the end of the month of April. The green line represents how much quicker the cropped reached heading when planting was between April 15th and May 15th and the red line represents how much quicker the crop reached heading when planting was delayed from the beginning of May through early June. Each of the three regression lines explained about 80% of the observed variation in the data.

The loss of the number of days to heading, i.e. the faster the pace of development as planting is delayed, is most severe in the first period and the least severe in the last period. This may seem a bit counter intuitive, but think of it this way – in early April the average temperatures are much lower than in early May or June and thus fewer growing degree days are accumulated each day. Planting delays will move the crop into a time period where the average differences in daytime high temperatures and nighttime lows are smaller when compared to the previous two week period.

So what does this mean in terms of actual heading date? Using the three regression lines, a crop seeded in April 1st near Fargo is expected to head on June 10th, while a crop seeded on May 1st will head on June 22nd. The difference of a month in seeding date is reduced to less than two weeks.

How does this correlate to yield? The relationship with yield is less clear than with days to heading. In the same analysis, the yield loss was about ¾ bushel per day of planting delay when using the mid-point planting date data set but the model only explained about 10% of the observed variability. This suggest that yield potential is reduced as planting is
delayed but that weather conditions during grain fill (i.e. nighttime and daytime temperatures) and absence or presence of disease (remember the early nineties are included in this data set) have more to do with the final yield than the fewer number of days to heading.

Jochum Wiersma and Michelle Meijer
Extension Agronomist and Research Assistant
University of Minnesota

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**EARLY OBSERVATIONS IN WHEAT**

Disease reports for small grains have been minimal for much of the state and the primary causes of symptomatic leaf tissue have been abiotic (non-living stressors). The most common abiotic disorder this year is heat canker (Figure 1). This disorder occurs when young leaf tissue is in contact with high temperature soil at early stages of development. The damage on the leaf will be yellow to white (bleached) and appear constricted.

Eventually the leaf tip may die-off giving the plant a ragged appearance (Figure 2). No economic implications are associated with heat canker as the small grain plants tend to grow out of it. As always, it is important to diagnose the cause of a lesion before developing a potential management plan.

*Figure 1. Early (left – Photo taken by Taheni Gargouri Jbir, Williston REC) and more advanced (right) symptoms of heat canker on wheat.*
Wet weather results in shallow groundwater depths and saturated soils, whereas, dry weather results in lower groundwater depths. However, increased evapotranspiration under dry weather results in increased wicking up of soil water (capillary rise) towards the surface. Dry weather is the reason that the “white barren saline-sodic areas”, along the headlands and road-side or in-field ditches have become prominent (Figure 1).

Most headlands are adjacent to roadside ditches. When ditches are full of water, the groundwater depths in the ditches and headlands are similar (Figure 2). That leads to shallow groundwater depths in the headlands. Subsoil salts and sodium found in the parent material dissolve in the soil solution and wick to the surface. This results in saturated, saline and sodic soil conditions.

Over time, these areas grow and reduce productivity of once fertile soils. The lack of plant growth...
increases erosion causing topsoil blow away. It is dollars directly out of producer’s pocket when the precious fertile topsoil blows away.

Planting cash crops like wheat, canola, corn or soybean on these saline-sodic headlands will likely result in poor stands. According to the NDSU projected 2018 crop budgets for NE North Dakota, the average planting cost for spring wheat is $93.46 per acre. For canola, it is $139.48 per acre for the same inputs, whereas, for corn and soybeans the input cost is $169.33 and $82.27 per acre, respectively. No production in the saline areas results in a net loss. By establishing perennial salt-tolerant covers, we can not only profit from these currently unproductive areas but can also minimize blowing of topsoil (Figure 3).

Remediating and making a Profit

Establishing a vegetative cover is the key to utilize excessive soil moisture, intercepting salt-carrying water before it will affect productive areas, reducing evaporation from the soil surface, adding organic material and increasing microbial activity. Annual crops like barley, oat, sugarbeet and sunflower can be good choices for a cover crop, however, often the Electrical Conductivity (EC) levels of the saline headlands are too high (saturated paste extract EC greater than 4.0 mmhos/cm). This will prevent these crops to yield profitably. In addition, annual crops will require planting every year. On areas having saturated paste extract EC levels of 8.0 or more mmhos/cm (or dS/m), planting strips of salt-tolerant perennial grasses may be a better option. These grasses will grow at EC levels ranging from 14.0 to 26.0 mmhos/cm. Strips could be 30 to 50 feet wide along the headlands, road-side or in-field ditches. Seeding rate for the mix is 7 to 8 pounds per acre and costs about $30 per acre. It takes about one year for these grasses to establish and about two years to suppress weeds. With active management, these strips will require mowing or haying. Below are two perennial salt-tolerant grass mix options.

**Mix 1:** Is a perennial mix of Tall, Western, Slender, Green (AC Saltlander) Wheatgrasses and Russian Wildrye. Species percentage in the mix will be 21.25% each for Tall, Slender and Western Wheatgrasses along with Russian Wildrye and 15% for Green Wheatgrass. Seeding rate for all five grasses will be 8 pounds per acre with 1.2 pound of Green Wheatgrass and 1.7 pounds each of the other four grasses.

**Mix 2:** If the strips are adjacent to a native rangeland, then Green Wheatgrass should be replaced with Strawberry Clover, which is a broadleaf and is salt-tolerant. That is suggested as Green Wheatgrass is crossed with Quackgrass and rhizomious. This can lead to being invasive. However, if Strawberry Clover is not available, seeding rate for one of the other grasses in the mix for example Western Wheatgrass can be increased.
By planting strips of these mixes, white saline areas can be contained and reduced. Plan on this remediation strategy to take three to five years. Producers can either mow or sell their hay made from the strips. In addition, by planting these strips onto the saline headlands, producers may be able to get payments from the government programs. For details, please visit your local Natural Resources Conservation Service office.

With time, these headlands might be planted with crops like wheat, canola and corn and soybean again. However, if we go through a dry cycle shortly after establishing these strips, headlands may still be one of the worst areas of the field as there will not be enough rain or snow melt to push the salts out of the root zone despite lower groundwater depths. However, with established perennial salt-tolerant covers, remediation of headlands will still continue.

Naeem Kalwar
NDSU Extension Soil Health Specialist

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**HOW DO WEEDS GROW UNDER HOT AND DRY CONDITIONS?**

Weather in eastern North Dakota and west central Minnesota has been unseasonably hot and dry. Most crops are emerging or have emerged. Many growers and service providers have reported inconsistent stands in fields including sugarbeet fields. Believe it or not, hot and dry weather impacts the germination and emergence and growth and development of weeds, too. Even more importantly, dry weather can complicate weed control efforts.

Small seeded broadleaf weeds germinate from the soil surface to ½ inch deep in soil. That means, the same dry soil conditions plaguing our crop stands are affecting germination and emergence of weeds. Weeds that do emerge could be more difficult to control so control weeds when they are small. Weeds tend to be more sensitive to herbicides when they are actively growing under good moisture. Weeds grow more slowly and develop thicker cuticles on the leaf surfaces under extended dry conditions, which has the overall effect of reducing herbicide movement into and throughout the plant.

The following are suggestions for using systemic herbicides like glyphosate or contact herbicides like Liberty or Flexstar under dry conditions.

- **Use full rates of glyphosate products to help offset effects from thicker cuticles and lower translocation rates.** Be sure you know the surfactant loading of the glyphosate product you choose and add extra non-ionic surfactant, as allowed per label directions to counter the effects of hot weather. I use 0.25% v/v non-ionic surfactant even when using PowerMax. This is especially important with thick-cuticle weeds like lambsquarters.
- **Use the full rate of ammonium sulfate (AMS), particularly when hard water is a concern.** AMS conditions water and will aid in maximizing glyphosate uptake by target weeds.
- **Contact herbicides such as Liberty, Betamix or Flexstar become more active as temperatures increase.** Increased activity may provide improved weed control but can also result in greater crop injury. Consider using these products and other contact herbicides in the afternoon or early evening on days when temperatures are forecast for 85 degrees and above. Postpone application of these herbicides if temperatures exceed 90 degrees to reduce risk of crop injury.
- **Target small weeds to ensure complete spray coverage with contact herbicides.** Spray nozzles, water volume and droplets size are different than the ones used for systemic herbicides like glyphosate or dicamba.
- **Many contact herbicides are labeled for use with adjuvants like methylated seed oil (MSO), crop oil concentrate (COC), or non-ionic surfactant (NIS).** However, most additives also increase the chance for crop injury. Omitting the adjuvant or using the lower labeled rate of the recommended adjuvant will reduce injury potential from a contact herbicide applied at hot temperatures.
- **Oils from formulation from secondary tank-mix herbicides can increase the chance for crop injury from primary herbicide.** Tank-mixes are an excellent resistance management strategy and broaden spectrum. However, formulated adjuvants may increase crop injury. Reduce or eliminate adjuvants under these scenarios.
Warm temperatures appear to be forecasted for the next seven days across the area. Planting appears to be wrapping up in the region. Pulses have emerged with canola having to begun emerging over the last week. Some soybeans continue to be planted, but expect continued emergence over the next few days.

Over the last week, the Minot NDAWN weather station recorded some much welcomed rain – though we are looking for more. Minot received about 0.28”, Bottineau 0.29”, Crosby 0.70”, Garrison 0.26”, and Rugby 0.84” of precipitation. Precipitation remains part of the short term forecast. Soil temperatures (bare) continue to rise, ranging from the mid-60s to the mid-70 degrees (NCREC/Minot - 74˚F, Bottineau - 65˚F; Crosby - 68˚F; Garrison - 66˚F; Rugby - 63˚F).

Canola Striped and Crucifer Flea Beetle populations are continuing to climb at the North Central region with some crop calls coming in. As a reminder, scouting should be on-going in canola until the crop reaches the 4th to 6th leaf stage. Most damage is likely to occur during the first two weeks following crop emergence. For foliar insecticide applications, the action threshold arrives when 20-25% defoliation has occurred to plants younger than the 4th leaf stage. For more information on the Canola Flea Beetle, please refer to the NDSU Extension “Integrated Pest Management of Flea Beetles in Canola” publication (E1234) or last week’s crop and pest report.

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NORTHWEST ND

Early-season crop planting is mostly done in NW ND. Rain showers in the middle of last week have delayed planting of the last few fields of spring wheat for some farmers, but fields remaining now are largely going to warm-season crops such as sunflower, annual forages, or soybean. Much-needed rain fell across the area over Memorial Day weekend. Sunday through Tuesday totals ranged from 0.5” in Bowbells to 1.5” in Alamo in Williams County. Crosby received about 1.25” and Williston 0.75”. Watford City received about 0.6” on Sunday but missed storms on Monday and Tuesday. Thunderstorms are again likely Thursday afternoon on the 31st and some places may pick up more rain on Friday, June 1st. After that, temperatures are predicted to be in the 60’s and 70’s during the first week of June. The moisture and moderate temperatures should help get late-planted crops off to a good start. At the Williston Research Extension Center, spring wheat is tillering and pulse crops are emerged. Attention has turned to spraying and early-season weed control. I noticed a few narrow leaf hawksbeard plants bolting around the WREC, so control is needed now to prevent it from going to seed.

Narrow leaf hawksbeard has been listed as a County noxious weed in Williams County, ND.
SOUTH-CENTRAL

The region’s NDAWN station data indicate rain during the month (May 1-29) ranged from 0.9 inch (Brampton, Harvey, Lisbon, and Oakes) to 3.4 inches (Marion). Considering the high temperatures during the past week, more rain would be welcome to support the young crop, to activate PRE herbicides applied for soybean and dry bean, and aid growth of pastures and hayland.

Alfalfa is in the bud to early bloom stages. Advanced winter cereals are heading. The region’s small grain and corn generally have very good stands. Early seeded (late April) barley and spring wheat are in the 4- to 5-leaf (tillering) stages. Corn planted during the first week of May has 2-4 leaves (V2-4 stages). Application of POST herbicides for small grain and corn is in progress — weeds are doing as well as the crops! Planting of soybean should be nearing 90% complete and dry bean 65-75% complete by the end of this week. The majority of planted soybean acreage has emerged plants.

The Carrington REC continues work with winter rye as a cover crop for soybean and dry bean. The picture is from the CREC’s off-station research site near Wishek showing soybean planted into plots with various timings of rye termination.

Greg Endres
Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center

SOUTHWEST ND

Rain over the past week in the southwestern region of ND has been welcomed, but is slowing sunflower planting. Many are still working on planting sunflower acres, but most crops in the region are in the ground and emerged. Early planted cereals are beginning to tiller. Many are preparing for in crop herbicide applications.

NDAWN recorded 0.49 inch of rain in Dickinson between May 22nd and May 30th. Over the same period Hettinger recorded 0.52 inch with 0.33 falling on May 30th. There are parts of Mercer and Dunn counties that are still very dry and have missed many of the showers.

Ryan Buettow
Extension Cropping Systems Specialist
NDSU Dickinson Research Extension Center
WEATHER FORECAST

The May 31 through June 6, 2018 Weather Summary/Outlook/Inversion App Information

These past seven days were quite warm with temperatures 10° to 20° above average across much of the region. In fact, these past seven days may end up as the warmest period of the summer, or close too it. Granted, such a week in July would be closer to 10° above normal, yet in terms of actual temperatures it would not surprise me that although it occurred in late May, this past week ends up being the warmest stretch of 2018, or again, close to it.

With the warmth did come some rain with eastern Montana into western North Dakota recording the most. Northwestern North Dakota in particular recorded widespread 1” plus rainfall. Although there are nearly 100 North Dakota Agricultural Weather Network (NDAWN) stations, those stations do not always catch the heavier pockets of rain. Because thunderstorms drop widely varying totals there were several other localized areas where over an inch of rain fell in the past week scattered across the region that are not shown in the graphic (Figure 2).
June is expected to start off much cooler than May ended. Yes, there will be the occasional day, but many of the next 7 to 10 days look to be recording temperatures much closer to seasonal averages. These temperatures may seem cool based on the higher temperatures many parts of the area have recorded lately, but for early June they should be near or even slightly above the average for this time of year. Although every day in the past week some part of North Dakota or northwestern Minnesota recorded some rain, it was mostly hit and miss with more missing than hitting on many of the days. Besides some lingering rains this morning (Thursday), the next opportunity for precipitation looks to be Friday into Saturday. Then again next Tuesday into Wednesday. Both events will have a brief surge of warm air ahead of the rain/thunderstorms with noticeable cooling once the cold front that will trigger the rains moves through. Because of the much cooler conditions expected, the growing degree days (GDDs) base 50°, 44° and 32° will be approximately 25% lower than last week (see Figure 3).
Using May 5 as a planting date, the accumulated wheat growing degree days (Based 32°) is presented in Figure 4 through May 29, 2018. You can find your exact GDDs for your planting date(s) at: https://ndawn.ndsu.nodak.edu/wheat-growing-degree-days.html

![Figure 4 Accumulated Wheat Growing Degree Days since May 5, 2018](image)

Using May 10 as a planting date, the corn accumulated growing degree days is presented in Figure 5 through May 29, 2018. You can find your exact GDDs for your planting date(s) at: https://ndawn.ndsu.nodak.edu/corn-growing-degree-days.html

![Figure 5 Accumulated Wheat Growing Degree Days since May 10, 2018](image)
INVERSION APP INFORMATION

NDAWN in association with the financial support of the North Dakota Soybean Council and the North Dakota Ag Aviation Association, are all happy to announce the near release of the NDAWN Inversion App. The app has been released to both the Apple App Store as well as in Google Play. This means the app will hopefully be available any day now for both iPhones/iPads and Android Phones and Tablets. The app once installed on your device will have the ability to send you notifications when an inversion is detected at the NDAWN station(s) you choose. In fact, when you first open the application it will ask you to select your stations and also allow the application to send you notifications. (See Figure 6a and 6b). Not all NDAWN stations have sensors in place that can detect inversions so the list will include only those stations with such capabilities. Once additional stations are added, those sites will be added to the list.

Then you will have a choice of which current weather station you would like to choose. All 99 NDAWN stations are available to select this time, but again, not all of them can detect inversions. If you do select a station with inversion capabilities the station page will tell you if there is an inversion in place. An exclamation point in a warning triangle with the words “inversion alert” will show up on the top of the screen if an inversion is detected (Figure 7a). Plus, a notification will be or was sent to you as well. After the first notification is sent, others will be sent every two to three hours until the inversion dissipates. If no inversion is currently in place a check mark with “No Inversion” will be shown (Figure 7b). Besides inversion information on the top for sites with such detection capabilities, the current air temperature, wind speed and all other weather conditions will be listed for all stations. This will help you monitor the wind speed and air temperature to make sure you are within label instructions and/or state dicamba rules as you are spraying. There is currently no forecast available in the application, only current conditions.
Unlike our website, the current weather page will not update automatically. You will have to pull down from the top of your screen to update the page (see Figure 7c). All NDAWN stations update every 5 minutes, 24 hours a day. Once you download this app, if you have questions, please email me at the address below, or within the app there is the option to email me as well. As of this writing the app is not available, but is expected to be released for download any day now.

Daryl Ritchison
Meteorologist
Interim Director of the North Dakota Agricultural Weather Network
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