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**SCOUT FOR RED SUNFLOWER SEED WEEVIL**

According to the IPM Crop Survey scouts, sunflowers are in the R2-R4 crop stages. However, I expect flowering to start next week. Scouting for red sunflower seed weevils (RSSW) is recommended during the early flowering stages when the yellow ray petals are just beginning to show. RSSW is attracted to the early blooming sunflowers, as females must consume pollen before laying eggs. Continue scouting until the economic threshold is reached or most plants have reached 70% pollen shed (R5.7). At 70% pollen shed, plants are no longer susceptible for egg laying or significant damage. On older flowering plants (after R5.7), larvae of RSSW (and banded sunflower moth larvae) will be feeding inside the seeds and protected from the insecticide. By then, much of the feeding damage has already occurred.

Please send me your field reports including locality and numbers of red sunflower seed weevils when you start finding them.

**Identification:** RSSW are small (¼ inch long), reddish-orange weevils with a snout.

**Scouting:** When sampling, use the X pattern and begin counting at least 75 to 100 feet into the field to avoid field margin effects. Count the number of RSSW adults on 5 plants at 5 sites for a total of 25 plants. Consult the NDSU Extension YouTube video on *Scouting for Red Sunflower Seed Weevil in Sunflowers* for more details.

### 2019 RSSW Threshold

**Oilseed sunflower** at 17.5 cents per lb:
- 18,000 – 22,000 plants per acre
- $8 - $10 insecticide cost per acre
- 4 - 6 weevils per head

**Confection sunflowers:**
- 1 weevil per head
SCOUT FOR LYGUS BUG IN CONFECTION SUNFLOWERS

Identification: Lygus bug is primarily an insect pest concern in confection sunflowers only. Adults are small, cryptically colored insects with a distinctive yellow triangle or “V” on the wings, and are about ¼ inch in length. They vary in color from pale green to dark brown. Lygus bugs insert their mouthparts into developing sunflower seeds and inject a toxic saliva into the seed causing a brown to black spot called “kernel brown spot.”

Scouting: Count the number of Lygus bug adults on 5 plants at 5 sites for a total of 25 plants. Scout for Lygus bugs during flowering. Sunflowers are susceptible to feeding injury from flowering through seed hardening.

SPRAY TIMING IMPORTANT FOR EFFECTIVE SUNFLOWER INSECT CONTROL

Once sunflower insects reach their established economic thresholds and the decision to treat has been made, it is critical to time the spray application correctly to get effective management of all sunflower head insects including red sunflower seed weevils, banded /Arthuri sunflower moths, sunflower moths and Lygus bugs (for confection sunflowers only).

The best sunflower plant stage to treat for all of these head-infesting insect pests is when the majority of the plants are in the early flowering R5.1 growth stage (when pollen shed on 10% of the outer rim of the sunflower head).

Scheduling an airplane may take a week or more if ag pilots are busy spraying, so we recommend planning for your insecticide application when only 30% of the plants in a field reached the R5.1 growth stage. If it’s hot, flowering will progress more rapidly and one week may not be enough lead time. Getting the timing right in this situation is difficult, but making arrangements when 5-10% of plants are at R5.1 may be more prudent. At Casselton in 2017, sunflower progressed from 1% at R5.1 to 50% at R5.1 in just a few days. Insecticides should be targeted at the adult RSSWs to prevent egg laying; at the adult and early larval stages of BSM and sunflower moth; and at the adult or nymph stages of Lygus bug.

Please see the NDSU Extension E1143 2019 ND Field Crop Insect Management Guide for insecticides registered in sunflower. Please remember that blooming sunflowers are attractive to bees, so insecticides should be applied in the late evening (preferred by honeybee keepers) or early morning to minimize negative effects of an insecticide on bees. See the ND Department of Agriculture bee map for help finding the locations and owners of hives.

NEW INSECTICIDES REGISTERED IN ND

Sefina® Inscalis® (active ingredient afidopyropen, Group 9D) from BASF is registered for control of soybean aphids in soybeans. The rate is 3.0 fl oz per acre and there is a 7 day Preharvest Interval (PHI). Residual testing on Sefina® found that the residual was efficacious against soybean aphids for 21 days. The estimated cost of Sefina® is about $6.00 per acre at the 3.0 fl oz per acre rate.

Transform® WG (active ingredient sulfoxalfor, Group 4C) from Corteva is registered for use in the following North Dakota field crops: alfalfa, canola, cereal crops (barley, oats, rye, wheat), field corn, dry beans, potatoes and soybeans. It will control piercing-sucking insect pests including aphids, leafhoppers, plant bugs and potato psyllids. Other crops and insect pests are listed on the label. It is now registered in the North Dakota State Department of Agricultural Pesticide Database. For soybean aphids, the rate is 0.75 -1.0 fl oz per acre and there is a 7 day PHI. An estimated pricing for Transform® WG is about $7.37 per acre at the 1.0 fl oz per acre rate.

Both Sefina® and Transform® WG are selective insecticides and control only certain insect pests. An advantage is their favorable profile to beneficial insects and bees. These products also provide a unique mode of action and are a good fit for resistance management of insect pests that are known to be resistant to other insecticide groups, such as pyrethroids, neonicotinoids, organophosphates and carbamates.
SOYBEAN APHIDS CONTINUE LOW

Soybean aphids continue to be very low in ND and MN. This is beginning to sound like a broken record but the IPM Crop Survey observed about 0-10% of plants in field infested and an average of <1 aphid per plant in ND and MN (see maps below). The pie chart map shows the proportion of plants observed by different aphid densities. If the pie chart shows mainly orange to red, this indicates those fields have more plants that are getting closer to the economic threshold of 250 aphid per plant. Thanks to Dr. Phil Glogoza, retired Extension Educator, for creating these useful pie chart maps. Maps are posted weekly on the NDSU IPM website. Please send me any field reports on soybean aphids.
GOOD BUGS HELPING US OUT WITH PEST CONTROL

Thank you for sending in your insect photographs for me to identify over the last several weeks. Here are some of the highlights of the ‘good’ bugs that were emailed or texted to me. These good bugs naturally reduce our insect pest populations in field crops. A great reason not to spray any harmful insecticides, especially when insect pest densities are below the established economic threshold. Broad-spectrum insecticides kill all beneficial insects.

Parasitic Wasps: White cocoons of parasitic wasps (Figure 1) are being observed in wheat heads. A tiny adult wasp (or parasitoid) will emerge from each cocoon, and then go to work parasitizing insect eggs, small caterpillars or soft-bodied insects, such as aphids. In Figure 2, tan, balloon-like cereal aphids indicate a parasitized aphid by a wasp. The adult female wasps inserts one or more eggs into the aphid’s body. Aphids then become paralyzed while the wasp larva consumes the aphid from the inside out. Parasitized aphids are called ‘mummies.’ Once the larva completes pupation, they chew a small circular hole through the ballooned aphid and emerge as an adult wasp to repeat the cycle.

Figure 1. Cocoons of parasitic wasp (Ross C. Peterson, Centrol Crop Consulting)

Figure 2. Aphid mummies in wheat head (Melissa Seykora, NDSU Extension Sargent County)

Lady beetles (Figure 3): Adults and larvae of lady beetles are generalist predators that feed on aphids, thrips and other soft-bodied insects and insect eggs. The seven-spotted lady beetle adult may consume 300 aphids per day! Pupae of lady beetles are easy to find in fields attached to leaves of many field crops (Figure 3). They are not harming the plant and often misidentified as a pest. An adult lady beetle will emerge from this puparium.

Figure 3. Left to right - Adult Multicolored Asian lady beetle (P. Beauzay, NDSU), alligator-shaped larvae of lady beetles (J. Knodel, NDSU), and pupa of lady beetle (T. Duchsherer, Scheresky Ag Service)

Janet J. Knodel
Extension Entomologist
BLOOMING SOYBEAN AND SUNFLOWER

Soybean

Due to later than normal planting of soybean in North Dakota, the percent of fields with blooming soybean plants has been lower than normal during July. The top line in Figure 1 represents the 5-year average (2014-2018) of the percent fields with blooming soybean plants. The second line from the top indicates the percent of fields blooming in 2019. As of July 28, 71 percent of the soybean fields were in bloom or completed flowering.

Source: National Agricultural Statistic Service ND Crop Progress and Condition reports.

Soybean flowers typically are self-pollinated on the day when the corolla opens. The amount of natural crossing is approximately 1% for adjacent plants within a row and 0.5% between plants in adjacent rows. Natural crossing is primarily done by honeybees. The stigma is receptive to pollen about 1 day before anthesis and remains receptive for 2 days after anthesis. Shortly after pollination, the pod formation phase starts. The pod development stage, R3, is reached when the pods are 3/16 inch long at one of the four uppermost nodes on the main stem with fully expanded trifoliate leaf. Abortion of pods and seeds can occur several weeks after pollination, but the percentage of abortion usually is low if plant stress is minimized. Moisture stress during the pod development and grain filling growth stages will result in lower yield. Description of soybean growth stages can be found in the Soybean Growth and Management Quick Guide at https://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a1174.pdf.

Figure 1. Percent of the North Dakota Soybean and Sunflower Fields Blooming.

Sunflower

The sunflower crop is only slightly behind normal development (Figure 1). On July 28, 22 percent of the sunflower fields had blooming sunflower. Flowering is a critical time to scout sunflower for potentially damaging insects and diseases. Sunflower requires warm temperatures for fertilization and seed development. Cool temperatures can delay or prevent the pollination and fertilization processes by affecting the activity of pollinators and the metabolism of the plant. Temperatures in excess of 86°F also may prevent normal pollination and fertilization. Sunflower is a cross-pollinated plant. Sunflower is pollinated mostly by insects. Bees are frequent visitors to flowers on warm, sunny days. Little pollination takes place by wind. Sunflower pollen is rather heavy and sticky and most of it drops on the leaves or on the ground in clumps. The head of the sunflower is a compound inflorescence composed of many individual flowers in a large disc surrounded by large ray flowers. The ray flowers are normally asexual, but some may produce pollen. The disc flowers are perfect with petals and five anthers that are united in separate tubes. Early in the morning, the staminal
filaments rapidly elongate and exert the anther tube from the corolla, this occurs about 7:00 AM during a warm, sunny day, but later on a cool, wet day.

The disc flowers are arranged in concentric circles radiating from the center of the head. The ray flowers open first and flowering then proceeds from the periphery to the center of the head at the rate of one to four rows per day. The digit in the growth stages R5.1 to R5.9 represent the percent of the sunflower head that has completed pollination. The description of sunflower growth stages can be found at https://www.ag.ndsu.edu/publications/crops/stages-of-sunflower-development.

Blooming sunflower. In field variability of growth stages from R4 (background) to R5.9.

Hans Kandel
Extension Agronomist Broadleaf Crops

LATE BLIGHT SPORE TRAPPING NETWORK

The late blight spore trapping network was started in July 2019. The threat of late blight is a looming concern for potato growers as it has potential to cause severe yield and financial losses. Early detection and protection can help save a potato crop, as it is unknown when late blight spores are in proximity to potato fields. The potato Blightline, utilizes a weather model to indicate when conditions are favorable for late blight, but does not indicate if late blight spores are present. The focus of this project is to provide data on late blight spores. Spore data in addition to utilizing the predictive model can improve late blight management strategies. There are a number of cooperating farms who have placed a
wind driven spore trap near a potato field (Figure 1). The filters are changed weekly and sent to Dr. Neil Gudmestad’s laboratory for detection of late blight. Results are published on the NDSU/UMN Potato Extension webpage at z.umn.edu/spud.

Figure 1. Late blight spore trapping network map.

Andy Robinson
NDSU/U of M Extension Potato Agronomist

BACTERIAL LEAF STREAK PREVALENCE AND COMMONLY ASKED QUESTIONS

Over the past couple weeks, we have observed high levels of bacterial leaf streak (BLS) in research plots and have fielded several questions from individuals across the state. Also, the NDSU IPM survey scouts identified BLS in 31% of the fields this past week. Both of us have written about BLS in previous crop and pest reports and this week we will expand on some of the most commonly asked questions.

Field Diagnosis

It is important to remember the different type of symptoms the bacterial pathogen can cause. Although we are most familiar with leaf disease symptoms, the pathogen can cause purpling of the grain spikes (black chaff) and cause yellow-purple lesions to form on the peduncle (stem tissue below the head). Purpling of the heads with striations along the glumes are both identifying features of black chaff (Figure 1). Peduncle lesions are often found on heads with black chaff or flag leaves with BLS (Figure 2). The peduncle lesions are not associated with lodging or any other disorders that may lead to problems at harvest. Black chaff can be confused with a fungal disease known as Stagonospora glume blotch. Although both can look similar to each other, here are a few tips to separate the two in the field.
(1) **Check the variety.** Knowing the susceptibility of a variety to bacterial leaf streak or Stagonospora leaf blotch can start pointing you in the right direction.

(2) **Examine the flag leaves.** Having a high level of BLS on the flag leaf will likely mean the spike symptoms are black chaff.

(3) **Review the field history.** For example, if fungicides have been applied, the field has looked clean prior to flowering, and a thunderstorm came through around heading, black chaff is likely the diagnosis.

(4) **Look for fruiting bodies or bacterial ooze.** Dark pepper grain fruiting bodies in the lesions on the spike are a sign for the Stagonospora glume blotch pathogen, whereas bacterial ooze (shiny exudate) will be a sign of the BLS pathogen.

*Figure 1. Black chaff on two wheat spikes. Notice streaks along the glumes of the spikelet.*
Relationship Between Diseased Leaf Area and Yield Loss in Wheat

One of the most commonly asked questions pertaining to BLS is yield loss. As a reminder, healthy green leaves during grain filling are the major source of carbohydrate that end up in the grain. The tissue comprising the spike, the stem and remobilization of carbohydrates and proteins from other plant tissues are also important contributors to grain development.

Field observations in Idaho in the 1980s reported that BLS caused yield losses as high as 40%. Other research completed in high rainfall environments estimated yield losses of 5% when 10% of the flag leaf had BLS and up to 20% yield loss when 50% of the flag leaf was damaged (Duveiller et al., 1993). Another study on spring wheat estimated yield losses of 13-34% when 100% of the flag leaf was damaged (Shane et al.).

Although all of these studies provided a good estimate of yield loss, it can be difficult to apply these yield loss metrics to the current situation. For example, the research studies listed above documented disease early in the growing season (around tillering). This year it appears most of the bacterial infections started when the state experienced strong thunderstorms in late June/early July and most of the wheat crop was headed or entering early stages of flowering. Therefore, the flag leaf was not likely infected until the heading to flowering growth stages. It is likely yield loss will occur in the impacted fields, but placing a specific yield loss number on these fields is difficult. This is further complicated by the fact BLS can be patchy in the field (i.e., areas prone to wind damage, headlands, etc). Regardless, if we use the relationships discussed above, one might expect yield loss of about 15% on the variety in Figure 3A and about 30-40% on the variety in Figure 3B. We think most of the yield loss in impacted fields this year will range from 1 to 15%.

Andrew Friskop
Extension Plant Pathology, Cereal Crops

Figure 2. Purple to yellow lesions on stem tissue directly below the spike (peduncle). These lesions are caused by the BLS pathogen.

Figure 3. (A) Spring wheat variety with 30-40% damage on the flag leaf. (B) Spring wheat variety with 100% flag leaf damage.

Joel Ransom
Extension Agronomist, Small Grains and Corn
BE ON THE LOOKOUT FOR WATERHEMP IN DROWNED OUT AREAS

Most of the Valley seems to have finally dried out from the heavy rainfall events in the first half of July. Unfortunately, the receding water has revealed a lot of acres of drowned out crops. To add insult to injury, many of the acres are now susceptible to late season weed flushes. Waterhemp is the most problematic weed to think about in these drowned out areas. Waterhemp can still germinate throughout August and produce more seed before the end of the growing season. In fact, we have already observed new flushes of waterhemp in our research plots in Fargo that spent 14 days under water.

The main goal in these drowned out areas will be the prevention of additional seed production. Tillage is a viable control option. Mowing can help reduce seed production but will not completely eliminate it. Herbicides can be useful in these drowned out areas. Herbicide choice will probably be driven on a field to field basis depending on the weeds in these areas, the remaining crops in fields with drowned out areas, and the crops surrounding these fields. The remaining crops in these fields are likely well past the growth stage cut-offs of most herbicides, however, these drowned out areas can practically be treated as fallow or prevent plant ground. Group 4 herbicides like 2,4-D or dicamba will be
effective on broadleaf weeds. However, extreme caution should be practiced if using those herbicides since nearby sensitive crops will be well into reproductive growth stages where damage from off-target movement is more likely to cause yield loss. Paraquat (Gramoxone, others) and glufosinate (Liberty, others) can offer non-selective control of emerged weeds, but can also cause issues if drift onto sensitive crops occur. Overall, preventing additional weed seed production in these problem areas will give us a leg up on weed control in 2020 and future years.

Joe Ikley
Extension Weed Specialist

PESTICIDE USE ON PLANET

The following image was an infographic developed from the FAO Statistical Yearbook, 2013 and developed by Stokstad and Grullon for Science, August 16, 2013, vol. 341, issue 6147. I found the image on social media recently and elected to write about it in Crop and Pest. The image depicts pesticide use including herbicides, insecticides and fungicides.

There are several ways one can interpret the data based on your bias and perspective. Pesticide use ranged from 0.2 kg/ha in the countries of India and Mozambique to 59.4 kg/ha in the Bahamas. There did not appear to be any association between countries economic status and pesticide use. For example, pesticide use was 8.8 kg/ha in the Netherlands and 13.1 kg/ha in Japan. The authors suggested pesticide use was associated with education and training, the value of the crop produced and the environment where crops were produced. For example, Columbian coffee or tulips in the Netherlands.

The authors noted pesticide use was increasing in Asia, Central and South America and Eastern Europe. They attributed this increase to decreased price of older (generic) products which in some cases were less safe than more recently developed products that may be more expensive for the producer.

Finally, the authors suggested the lower use (decreased use) of pesticide in North America was attributed to development of biotech crops including Bt corn and cotton. Certainly, acceptance and widespread use of GMO technology in the United States and Canada has contributed to these totals. However, a word of caution. While pesticide use was less than 2.2 kg/ha in the United States and Canada, pesticide use still accounted for 20% of the world’s total in the United States, at least in 2007, the last years there were statistics.
AROUND THE STATE

NORTH CENTRAL ND

With the warmer temperatures in the area, crop progress is speeding up. Hit and miss storms have been extremely spotty in the area with brief rain showers - the following are area NDAWN observations: Minot 0.00”; Rugby 0.00”; Bottineau 0.00”; Rolla 0.00”; Plaza 0.00”; Mohall 0.08”; and Garrison 0.00”. Spotty observations of Fusarium Head Blight have been recorded in Renville and Rolette Counties. However, visual observation shows it is really hit and miss, likely limited to areas with microclimates where moisture can’t evaporate as quickly. Winter wheat harvest is just getting started as I witnessed a grower harvesting on the morning of June 30th north of Minot.

Observations of grasshoppers continue in the area. So continued scouting may be suggested. Wheat midge numbers appear to be falling. Sunflower moth presence is now detected in area traps. Scouting should continue for sunflower moths as numbers have increased over the last week. Scouting information for sunflower moths can be found in previous Crop and Pest Reports.

NORTHWEST ND

Sunny days and hotter temperatures are in the forecast for the next 5 days with highs in the 90’s for much of Northwest ND. Cool-season crops are maturing, and early planted fields are starting to turn color. Here’s an update of crop progress at the Williston REC: winter wheat hard dough, durum late milk to early dough, spring wheat late milk to medium dough, pea pods starting to turn yellow to brown, lentil green with full pods to starting to dry down and turning yellow, canola pods starting to turn yellow and seeds yellow with a few green present, flax showing some brown bolls but stems still green, and soybean R3 early pod. Winter wheat harvest will likely start next week, and some producers are considering desiccating peas this week or next.

With the dry May and early June followed by rain in late June and early July, some winter wheat and early planted spring wheat and durum fields have a lot of late tiller heads that are causing concern. The main heads are dough stages and will be ready to harvest within a week or two, while the late tillers, also called sucker heads, are still green and may still even be flowering. This is a challenging situation, but there are options: swathing, desiccation, and waiting. Swathing is a good option for an effective kill of the late tillers and allowing the primary crop to dry down evenly; though two operations may not be desirable, swathing is very effective and terminating the crop and controlling weeds that may have escaped. Desiccation can also work, but good coverage of the late tillers lower in the canopy is challenging; desiccation is also helpful for late-season weed control, but it will be ineffective at preventing seed set from winter annuals like horseweed that are setting seed now. Waiting may also be a good option this year. With hot and dry conditions predicted to dominate the 10-day forecast, allowing the main crop to mature fully and the late tillers to also dry could be a good strategy and save the time and cost of either swathing or desiccation.
NORTHEAST ND

Most parts of the region need rain for soybean and corn production. Cavalier, Pembina and Walsh County NDawn stations are short 4 inches of rainfall compared to the normal (from April 1 to this week). Cando and Crary are short 3 inches of normal rainfall. Daytime wilting of soybean plants and rolling of corn leaves can be found in the region. Small grain and pea harvest is nearing. Spring wheat fields are up to the soft dough stage. Canola has ended flowering. Sunflowers are starting to flower. Banded sunflower moth is in the region. Grasshoppers are still high in regions. Still no soybean aphids have been found. Bacterial leaf streak continues to be found on flag leaves of small grains in storm-torn areas.

Lesley Lubenow
Extension Cropping Systems Specialist
NDSU Langdon Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

Based on NDawn, the region’s total rainfall May 1 through July 29 ranged from 7.4 inches (Harvey) to 14.5 inches (Linton), and the Carrington REC received 8.1 inches. During the current month (July 1-29), rainfall ranged from 1.4 inches (Harvey) to 7.6 inches (Linton). Daily water use by corn (emerged on May 30) during the past week (July 23-29) averaged 0.25 inch.

The region’s corn growing degree day units (GDDU) accumulated from May 15 to July 29 range from 1065 (Robinson) to 1255 (Oakes). This range is -135 to +35 GDDU, depending on location, compared to the long-term average for the period.

Winter cereals are ready for harvest (see picture), early seeded barley is mature and spring wheat is in the dough stage. First-half of May planted corn is silking (R1 stage) and soybean has developing pods (R3-4 stages). Dry bean is in the pod- to seed-formation stages (R2-6). Wet soil surfaces, heavy dews, full plant canopies, cool weather are all contributing to an economic threat of white mold (sclerotinia) in dry bean. Field pea is at physiological maturity, and canola and flax are rapidly loosing green color. Yellow heads are starting to appear in sunflower (R5 stage). Hay harvest continues to be a common farm activity.

Winter rye ready for harvest at Carrington REC

Greg Endres
Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center
SOUTHWEST ND

Row crops are looking great in most of the region. While there aren’t many winter wheat fields in the region, much of the winter wheat in the area will be ready to harvest within the week. Field peas are reaching maturity. Black chaff and fusarium head blight are becoming evident in many small grain fields in the region. While it is difficult to predict what weather conditions will bring next year, it may be a good time to take note on which varieties are susceptible, and which are more tolerant for next year. For fusarium head blight and other diseases, be sure to take crop rotation into consideration.

While the growing season has brought plenty of moisture for many, things are beginning to dry out for now. According to NDAWN from July 19th to July 29th, no rainfall fell in Dickinson, 0.2 inch in Mott, 0.95 inch in Hettinger, and 1.83 inch in Bowman. Parts of fields with pH below 5.5 are becoming more and more evident across the region with symptoms of Aluminum toxicity. Be sure to look into liming options. While no-till and fertilizer usage has concentrated these low pH zones, tillage should not be considered a solution to this issue. While some are considering tillage as a short-term solution to acidic soils, it is necessary to take into consideration potential long-term costs from surface erosion, reduction in soil water holding capacity, nutrient cycling, and soil biology. While this year has been wet, we aren’t guaranteed to be wet in the future. No-till has done a great job of building the soils in southwest North Dakota over time and there are other solutions to the issue. Remember it takes many years to form an inch of topsoil; keep it in your field.

Ryan Buetow
Extension Cropping Systems Specialist
NDSU Dickinson Research Extension Center

WEATHER FORECAST
The August 1 through August 7, 2019 Weather Summary and Outlook

The combination of more cloud cover than expected and the anticipated cooler weather from earlier this week being even cooler than projected made the past week colder than forecasted (Figure 1). The warmer temperatures that moved into parts of the region yesterday will continue today through the weekend in all areas followed by a slight cooling early next week.
Figure 1. Temperature departures from average from July 25, 2019 to July 30, 2019 at selected NDAWN stations

Most of the rain that fell in the past seven days occurred this past Saturday night into Sunday (Figure 2). Many areas recorded little if any precipitation in the past week. This means there are now locations, especially in northern North Dakota that have recorded little to no moisture in the past three weeks. Like last week, there will be pockets of beneficial rain where the thunderstorms hit directly, but the odds favor most of North Dakota and northwestern Minnesota to record below average rainfall in the next seven days.

Figure 2. Total Rainfall from July 25, 2019 to July 30, 2019 at select NDAWN stations
Much warmer air is anticipated today through the weekend. Temperatures should be at or above average during this period with a slight cool down early next week. With the increase in temperature, there will also come an increase in the dew point temperatures. This will create conditions for higher relative humidity levels, especially in the overnight hours. A cool front is expected to move through on Sunday that should not only lower the temperatures a bit for early next week, but also bring in drier air, meaning, lower dew points and more comfortable air for both cattle and humans.

My projected growing degree days (GDDs) for the next seven days for Base 50°, 44° and 32° is presented in Figure 3. With warmer temperatures anticipated, most locations are expected to have more GDDs this week than what was recorded during the last seven days.

Figure 3.Projected Growing Degree Days for the period of August 1, 2019 through August 7, 2019

With higher dew points already discussed and the increase risk of high relative humidity (RH) during the overnight hours, most locations will probably record more high RH hours this week than last. My projected hours with high RH through August 7 are presented in Figure 4.

Figure 4. Projected Hours with Relative Humidity above 85% from August 1, 2019 through August 7, 2019
Using May 5 as a planting date, accumulated growing degree days for wheat (base temperature 32°) is given in Figure 5. You can calculate wheat growing degree days based on your exact planting date(s) here: https://ndawn.ndsu.nodak.edu/wheat-growing-degree-days.html

Figure 5. Accumulated Growing Degree Days for Wheat since May 5, 2019

Using May 15 as a planting date, accumulated growing degree days for corn (base temperature 50°) is given in Figure 6. You can calculate corn growing degree days based on your exact planting date(s) here: https://ndawn.ndsu.nodak.edu/corn-growing-degree-days.html

Figure 6. Accumulated Growing Degree Days for Corn since May 15, 2019
Soybeans also use base 50° like corn, but NDAWN has a special tool for soybeans that based on your planting date and cultivar can estimate maturity dates based on average temperatures, as well as give you GDDs based on your planting date(s) you set. That tool can be found here: https://ndawn.ndsu.nodak.edu/soybean-growing-degree-days.html

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Meteorologist
Director of the North Dakota Agricultural Weather Network
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