Inside this Issue...

NDSU Field Days: July 2019........1
Size Matters for Cutworm Control 2
Grasshoppers Emerging ...............3
Sugarbeet Root Maggot Alert: Fly Activity Peaks Coming in Next 2 to 5 Days ..................4
Soybean Planting Progress and Predicted First Flower ......6
Cover Crops for Prevented Planting- Café Talks ............7
Rain-Splashed Herbicide Injury ....8
Maximizing Glyphosate Efficacy – Best Management Practices.10
Cankerworms ................................10
Around the State ..........................12
North Central ND ..........................12
Northwest ND ..............................12
Northeast ND ..............................12
South-Central/Southeast ND ......13
Southwest ND ..............................13
Weather Forecast .........................14

NDSU FIELD DAYS: JULY 2019

Plan to attend a nearby NDSU Field Days to learn the latest in new crop varieties, agronomy, soil science, pest issues and more!

July 8: Central Grassland REC, Streeter
July 9: Hettinger Research Extension Center – Hettinger, N.D.
July 10: Dickinson Research Extension Center – Dickinson, N.D. 8:30 -noon
July 10: Williston Research Extension Center (dryland crops and horticulture) – Williston, N.D. 3 PM
July 11: Nesson Valley Irrigation Field Day – Williston, N.D. 8:30 AM
July 15: Agronomy Seed Farm – Casselton, N.D. 5 PM
July 16: Carrington Research Extension Center – Carrington, N.D. 9 AM - noon and 1 - 3 PM
July 17: North Central Research Extension Center – Minot, N.D. 9 AM - noon
July 18: Langdon Research Extension Center – Langdon, N.D. 8 AM - noon
August 15: Oaks Irrigation Field Tour – Oakes, N.D
SIZE MATTERS FOR CUTWORM CONTROL

Cutworm damage is starting to show up in the emerging field crops including alfalfa, canola, chickpea, field pea, lentil and sunflower. Cutworm larvae are difficult to scout for since they feed at night and hide underneath clumps of soil during the day. Cutworms are feeding more with the warm temperatures, causing cut plants, defoliation and stand loss. Now is the time to get out and scout for cutworms when crops are young, the most susceptible stage.

Cutworms generally have one generation a year. Dingy cutworms overwinter as partially mature larvae (or caterpillars) and then larva develop into a pupa (or resting non-feeding stage) in mid- to late June. The adult moth emerges from the puparium in July and moths lay eggs in late August into the fall. Eggs hatch into larvae that feed in the fall before burrowing deeper into the soil to overwinter. A mature dingy cutworm is about 1½ inch and the size of a pencil in width. The next life stage, pupa, can also be found in the soil and is a non-feeding stage. The adult moth will emerge from the puparium.

Scout fields regularly by looking for freshly damaged (or cut off) plants or defoliation, digging two or more inches down around the cut off plant, and search for cutworms (larvae). When disturbed, cutworms curl up into a C-shape. Row crops, such as soybean, canola, lentils, field pea and sunflower, are more susceptible to cutworm damage than small grains, because cut plants do not grow back (grains compensate by tillering). If a ‘rescue’ foliar insecticide treatment is warranted, an evening application is best since cutworms actively feed at night.

**Action thresholds for cutworms in different field crops are:**

- **Alfalfa** – 4 to 5 or more per square foot (new stands – only 2/sq ft)
- **Canola** – 1 per square foot
- **Corn** - 3-6% of the plants are cut and small larvae (<3/4 inch) present
- **Pea / Lentil** – 2 to 3 cutworms per square meter
- **Small grain** – 4 to 5 cutworms per square foot
- **Soybean** - 1 cutworm 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 per square foot or 25-30% of plants cut

Before pulling the trigger, look at the size of the cutworm larvae. If the majority of the larvae are small, <¼ 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 (finished feeding) and/or pupating (non-feeding stage).

For insecticides registered for cutworm control by field crops, please consult the 2019 North Dakota Field Crop Insect Management Guide E1143.

**GRASSHOPPERS EMERGING**

Grasshoppers are generalists, feeding on grasses, weeds and most field crops. Their life cycle is completed in 40 to 60 days from egg to nymph (young grasshopper) to adult. When a grasshopper first hatches from the egg, the nymph is only about the size of a wheat kernel. Grasshoppers pass through 5 to 6 growth stages as a nymph depending on the species of grasshopper. Nymphs do not have wings, only wing pads (arrow in photo), so they must crawl into fields.

Grasshoppers like hot and dry weather better than cool and wet weather. Cool, wet weather increases disease occurrence and delays development of grasshoppers, reducing the overall population. The current forecast is for below normal temperatures and above average moisture this week, so it is not favorable for grasshopper development.

Farmers and ranchers often use the beginning of bloom in common lilac as an indicator of when grasshopper hatch is under way. Yes, lilacs are blooming and so grasshopper nymphs are emerging. It is too early to say if we will have any problems with grasshoppers moving into field edges or fields. For crop damage, the chewing mouthparts of grasshoppers cause defoliation of leaves, and clipped heads or pods (usually later in season when adults are common).

IPM scouts have found low numbers of grasshopper nymphs last week (see map). Regular scouting of field edges is important because populations vary year to year. Use a 15-inch sweep net to find small grasshopper nymphs in grassy ditches next to emerging field crops. Action thresholds are based on the number of grasshopper nymphs or adults per square yard. Since it is difficult to estimate the number of grasshoppers per square yard when population densities are high, scouts can use four 180-degree sweeps with a 15-inch sweep net to estimate the number of adult (or nymph) grasshoppers per square yard. Early detection of grasshopper nymphs is vital for effective pest management.

The action threshold for nymphs is:

- **50-75** per square yard in field margins
- **30-45** per square yard within the field
SUGARBEET ROOT MAGGOT ALERT: FLY ACTIVITY PEAKS COMING IN NEXT 2 TO 5 DAYS

Sugarbeet root maggot (SBRM) fly activity has increased significantly at several grower fields throughout much of the Red River Valley (RRV) in recent days. NDSU is partnering with the American Crystal Sugar Company this year to monitor fly activity in a total of 111 RRV sugarbeet fields throughout the growing area.

Earlier this week, the most severe outbreaks were occurring near the following communities: Auburn, Bathgate, Crystal, Glasston, Grand Forks, Merrifield, St. Thomas, Thompson, and Walhalla, ND, as well as Argyle, Crookston, East Grand Forks, Eldred, and Stephen, MN. Fly counts from both NDSU and ACSC monitoring routes, are posted every Monday, Wednesday, and Friday evening at: http://www.ndsu.edu/entomology/people/faculty/boetel/flycounts/.

NOTE: this monitoring project is aimed at providing a general idea of where potential root maggot fly hot spots are developing throughout the growing season. Sugarbeet growers, crop consultants, county Extension personnel, and other crop production advisors are encouraged to do their own monitoring in fields for which they may have concerns.

A map of the accumulated root maggot DD units for all locations within the RRV is presented in Figure 1. Peak fly activity typically coincides with the first rain-free, warm (about 80°F), low-wind (< 10 mph) day on or after the accumulation of about 650 degree-day (DD) units.

Figure 1. Map of sugarbeet root maggot DD accumulations for the Red River Valley sugarbeet production area (Courtesy, North Dakota Agricultural Weather Network [NDAWN]).
Although high fly activity has already developed at several locations, major increases are expected in the central and northern RRV between Thursday, June 13 and Wednesday, June 19. An updated forecast for periods of high SBRM fly activity and expected peaks at four representative RRV locations, based on current DD accumulations and the extended weather forecast, is presented in Table 1.

<table>
<thead>
<tr>
<th>Location</th>
<th>Total DD June 10</th>
<th>Expected DD at June 15</th>
<th>High Fly Activity Period</th>
<th>Maximum Likelihood of Peak Fly *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fargo, ND</td>
<td>595</td>
<td>677</td>
<td>June 13-15 (+80°F, dry, and low winds)</td>
<td>June 13-14</td>
</tr>
<tr>
<td>Ada, MN</td>
<td>560</td>
<td>638</td>
<td>June 16-18 (+80°F, dry, and low winds)</td>
<td>June 17</td>
</tr>
<tr>
<td>Grand Forks, ND</td>
<td>548</td>
<td>626</td>
<td>June 16-18 (+80°F, dry, and low winds)</td>
<td>June 17</td>
</tr>
<tr>
<td>St. Thomas, ND</td>
<td>554</td>
<td>622</td>
<td>June 16-18 (+80°F, dry, and low winds)</td>
<td>June 17</td>
</tr>
</tbody>
</table>

*Maximum likelihood for peak fly activity is based on extended weather forecasts for wind speed, air temperature, and precipitation. Peak fly in current-year beets usually coincides with the first rain-free, calm/low-wind day to reach 80°F after the accumulation of 650 DD.

The similarity among peak fly date predictions for the three more northerly locations listed in Table 1 is based on two factors. First, and most obvious, is that DD accumulations are quite similar among those latitudes. A second consideration is the extended weather forecast which suggests an unsettled weather pattern that includes wind, up to 50% chances of rain, and less-than-optimal temperatures on some days where peaks would otherwise occur.

**CONTROL:** The expectation for unsettled weather on or close to the predicted peak fly activity dates listed in Table 1 makes it difficult to predict a precise date for peak activity at this time. However, current recommendations for postemergence insecticide applications should provide adequate flexibility for growers in affected areas to achieve successful root maggot management with postemergence insecticide applications.

Growers in hotspots or high-risk areas for SBRM infestation should plan to apply a postemergence insecticide, especially if an insecticidal seed treatment or a low to moderate rate of a soil insecticide was used at planting. This is particularly the case for late-planted or replanted fields because plants in those fields will be atypically small and vulnerable to attack by root maggot larvae.

Growers choosing to use a **granular** postemergence insecticide should have already applied it by now; however, adequate control may still be achievable by applying granules immediately, or at least 3 days before peak fly if the application is made shortly before an expected rain. Postemergence **liquid** insecticides work best if applied close to (i.e., 2-3 days before, during, or within 2 days after) peak fly activity. As such, growers expecting to use a liquid spray should monitor fields closely during the next week to 10 days for potential fly activity resurgences. Growers in the southern RRV who need to apply a postemergence liquid spray should do so as soon as possible. Those in the central and northern RRV should plan to spray fields between Friday (June 14) and Sunday (June 16). For more information, monitor local agricultural media sources (*radio, The Crop & Pest Report, and the “Fly Counts” web page*) for further updates on root maggot control and other insect pest management topics.

Remember to always READ, UNDERSTAND, and FOLLOW all label directions and precautions. It is illegal to use a pesticide in a manner inconsistent with its label. For more guidance on postemergence control strategies, consult the “Insect Control” section of this year’s *Sugarbeet Production Guide*.

Mark Boetel
Research & Extension Entomologist
SOYBEAN PLANTING PROGRESS AND PREDICTED FIRST FLOWER

Soybean planting progress for the 2019 season is a bit behind the 5-year average. The graph presents the percent soybean acres planted in North Dakota and is based on the weekly North Dakota crop progress report from the National Agricultural Statistics Service. The graph shows that by May 26, 46% of the soybean acres in ND were planted, well below the 5-year average of 65%. As of June 9th, 88% of the soybean acres were planted and 43% of the seeded fields had soybean plants emerged, compared to 68% for the 5-year average.

Using the North Dakota Agricultural Network (NDAWN), accumulated soybean growing degree days (GGD) and the departure from normal are presented in Table 1. Accumulated GGD will differ depending on the location in North Dakota. Due to the warm spell in the first part of June, both GGD for Prosper and Minot, ND are ahead of “normal.” Soybean plant development accelerated during this warm period.

Table 1. Accumulated soybean growing degrees and departure from normal at Prosper and Minot, ND for 2019 soybean planting dates as retrieved on June 11, 2009 (includes June 10 data).

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Prosper, ND</th>
<th>Minot, ND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accumulated GGD</td>
<td>Departure from Normal</td>
</tr>
<tr>
<td>May 12</td>
<td>344</td>
<td>-3</td>
</tr>
<tr>
<td>May 19</td>
<td>290</td>
<td>+11</td>
</tr>
<tr>
<td>May 26</td>
<td>248</td>
<td>+45</td>
</tr>
<tr>
<td>June 2</td>
<td>153</td>
<td>+33</td>
</tr>
</tbody>
</table>

Source: [https://ndawn.ndsu.nodak.edu/soybean-growing-degree-days.html](https://ndawn.ndsu.nodak.edu/soybean-growing-degree-days.html)
In 2014 a graduate student did a study about how many growing degrees were needed to get to first bloom (Table 2). Beginning of bloom (R1) is defined as the presence of at least one flower on the plant at any node on the main stem. There may be questions about when the first flower will appear with the later than normal planting dates this year. Flower initiation is based on heat units (accumulated GDD) as well as the photoperiod (the lengthening of the nights after June 21). The numbers in Table 2 are not absolute values as the GDD in 2015, to reach flowering, were about 30 less than in 2014.

Table 2 indicates that the plants will still need to produce leaves and nodes before they can flower (for instance D5 in Table 2). The soybean first flower initiates on the third to sixth node on the main stem. The plant will start flowering after fewer accumulated GDD when planting is delayed. Based on the currently accumulated heat units for planting dates May 12th through May 26th (Table 1) it is anticipated that flowering will be observed during the first half of July. Earlier maturing soybean varieties will flower a few days earlier than later maturing varieties when planted on the same day.

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Planting to R1 accumulated GDD</th>
<th>R1 days after planting</th>
<th>R1 date in study</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 25</td>
<td>855</td>
<td>47</td>
<td>July 11</td>
</tr>
<tr>
<td>June 2</td>
<td>806</td>
<td>46</td>
<td>July 18</td>
</tr>
<tr>
<td>June 11</td>
<td>766</td>
<td>41</td>
<td>July 22</td>
</tr>
<tr>
<td>June 21</td>
<td>775</td>
<td>41</td>
<td>August 1</td>
</tr>
<tr>
<td>July 1</td>
<td>725</td>
<td>39</td>
<td>August 9</td>
</tr>
</tbody>
</table>

Source: research by Ethan Sweep and Burton Johnson.

Cover Crops for Prevented Planting - Café Talks

We are planning a series of Café Talks on cover crops in prevented planting situations. These will be an excellent opportunity to meet with NDSU Specialists and Researchers to run through options. We will have insurance representatives there to provide input during the conversation. Like all Café Talks, these will be a discussion of options for mixes based on next crop in rotation, soil type, herbicide residual, fertility and any other questions that come up. No need to RSVP, just show up.

Bring information on herbicide applications, fertility, next crop in rotation and goals so that we can customize plans.

The Schedule starts on the next page.
June 17, 9:30 – 11:00  Casselton
Governors Inn, Flickertale Room, 2050 Governors Drive, 701-347-4524
Specialists: Joe Ikley (weeds), Marisol Berti (cover crops), Dave Franzen (fertility), Abbey Wick (soil health)
Coffee and Muffins provided

June 17, 12:30 – 2:00  Valley City
AgCountry Farm Credit Services, 220 Winter Show Rd SW, 701-845-1751
Specialists: Joe Ikley (weeds), Marisol Berti (cover crops), Dave Franzen (fertility), Abbey Wick (soil health)
Lunch provided

June 18, 10:30 – 12:30  Gwinner
Springs Golf Course, 565 Bogey Road, 701-678-3910
Specialists: Joe Ikley (weeds), Dave Franzen (fertility), Abbey Wick (soil health)
Lunch provided

June 20, 11:00 – 12:30  Jamestown
IDK Bar and Grill, 1009 13th St NE, 701-952-5550
Specialists: Joe Ikley (weeds), Marisol Berti (cover crops), Abbey Wick (soil health)
Lunch provided

The 2019 Café Talks continue to be supported by the ND Corn Council, ND Soybean Council and ND Wheat Commission.

Abbey Wick
Extension Soil Health Specialist
701-850-6458

RAIN-SPLASHED HERBICIDE INJURY

I have received several phone calls this week about PPO-inhibiting (Group 14) herbicide injury on soybean, dry bean, and pulse crops. These calls have originated from the northeastern part of the state and all have three things in common: these fields received some rainfall this past weekend; this is the first activating rain since the herbicides were applied preemergence; and the crops had previously emerged with no obvious herbicide injury. This is a different set of circumstances than I wrote about two weeks ago for the Crop and Pest Report. My previous article focused on applying sulfentrazone (Spartan/Authority, generics), flumioxazin (Valor, generics) or saflufenacil (Sharpen products) to emerged soybean. In the injury cases fielded this week, herbicides have sat on the soil surface without any rainfall to incorporate them into the soil. Once fields received a heavy rainfall, the herbicide that is still on the soil surface can be splashed up onto emerged crop leaves and stems. The injury symptoms observed are the typical necrotic/"burned" lesions on leaves and stems that are associated with herbicides with this mode of action. Injury from splashed herbicides tend to be spotted wherever herbicide droplets deposit onto plant surfaces.

(continued on next page)
After confirmation of herbicide damage, the next questions are: “Will it grow out of it?” or “Do I need to replant?”  The answer to those questions is a strong maybe, and fields should be evaluated individually. In most fields, plants should respond favorably enough that yield loss should not occur and replanting in the middle of June would not be warranted. However, some of these fields also have the confounding factor of wind damage from June 7th’s hot, dry winds. In general, replanting should only be considered when there is severe injury to the growing points of the crop, or if stand loss is severe enough to warrant a replant. While herbicide injury cases can be hard to stomach, it is important to remember that this is a very important herbicide mode of action for broadleaf weed control in our broadleaf crops, and these herbicides remain important tools to help mitigate herbicide resistance weed issues. Moving forward, we will gain more benefits in weed control than the negative results in crop injury that we are seeing in many fields this year.

Joe Ikley
Extension Weed Specialist
MAXIMIZING GLYPHOSATE EFFICACY – BEST MANAGEMENT PRACTICES

Most crops are planted and growers will now shift their attention to controlling weeds. Understanding the factors that influence glyphosate performance, especially with glyphosate resistant weed, will maximize efficacy.

**Glyphosate concentration in formulation:** Glyphosate products are formulated in many different acid-equivalent concentrations. Concentration, measured as acid equivalent, will determine your use rate.

**Use full labeled rates:** Use rate is determined by the size and type of weed species in the field. In general, the bigger the weed species, the higher the use rate needed for control. Annual weeds are best controlled when they are in an early growth stage, actively growing, and less than four inches tall.

**Larger and older weeds are more difficult to control:** More mature or hardened-off annual weeds may require full rates, even if they are smaller in size. Environmental stress, such as dry weather, can cause weeds to be short for their age, requiring a higher rate for good control.

**Be aware of glyphosate resistant weed species:** Weed species differ in their sensitivity to glyphosate. Some weed species have natural tolerance to glyphosate, while others are resistant and control is unlikely regardless of the application rate. Tank-mixing herbicides with different and effective modes of actions and other weed resistance management practices in these situations can help to provide more consistent control of tolerant or resistant weeds. Using lower than labeled rates can lead to poor weed control and potentially select for resistant weeds.

**Always add nonionic surfactant** at 0.25 percent v/v to fully loaded formulations (*unless the label prohibits*), especially to improve common lambsquarters control, at 0.25 to 0.50 percent v/v to partially loaded formulations, and at 0.5 to 1.0 percent v/v to non-loaded formulations. Surfactants increase spray solution spreading on leaves, improving plant uptake and translocation of glyphosate. Addition of crop oil concentrate or methylated seed oil is not recommended with glyphosate.

**Always add ammonium sulfate** (AMS) at 8 lb/100 gallon, or liquid AMS at 2.5 gallon/100 gallon water to increase penetration into the plant for weed control and to condition hard water. AMS reduces the antagonistic effects of hard water.

**Spray volume and droplet size matter:** Glyphosate alone spray volumes of 5-10 gallons per acre (GPA) provides adequate coverage of weeds. Higher volumes (10-20 GPA) can be beneficial in situations with dense weed infestations, well developed crop canopies, large weeds and when applying in combination with contact or soil residual herbicides. Coverage can also be optimized by nozzle selection.

Tom Peters
Extension Sugarbeet Agronomist
NDSU & U of MN

CANKERWORMS

Cankerworms are back in force after a weak showing last year. Both spring and fall cankerworm larvae are out now, and are feeding voraciously on their preferred elm, basswood, boxelder, and apple. They may also attack other trees and shrubs. They feed on buds and expanding leaves, starting with small round holes and eating all the tissue between leaf veins as they grow.

Cankerworm eggs were laid in trees last year, and many have recently hatched into larvae. The larvae are slender, greenish to brownish “inch worms” and you may see them feeding on leaves or you may see them hanging from slender silken threads and traveling with the help of wind and gravity to a new food source. They will feed for 3 or 4 weeks then drop out of the trees and burrow into the duff where they will pupate. Fall cankerworm moths will emerge after the first frost, mate, and the flightless female will crawl up a tree trunk to lay her eggs. Spring cankerworm moths will emerge next spring to do the same thing.
Trees that are completely defoliated will usually leaf out again within two or three weeks. If the tree is in good condition, it will be able to tolerate at least two years of complete defoliation. Chemical treatment can be effective when the insects are still small - less than one-half inch long. Treatment is not effective after you can see severe damage. Some active ingredients of insecticides labeled for homeowners include: carbaryl, cyfluthrin, imidacloprid, esfenvalerate and permethrin. Biorational pesticides include Bacillus thuringiensis var. kurstaki (Bt), insecticidal soap, spinosad and pyrethrin. When using insecticides, mix and apply according to label directions.
AROUND THE STATE

NORTH CENTRAL ND

Some rain fell over the North Central region over the last week: Minot 0.08”; Rugby 0.09”; Bottineau 0.32”; Rolla 0.13”; Plaza 0.14”; Mohall 0.04”; and Garrison 0.56”. Minor cut worm damage is continuing to be reported in the area. Flea beetles are hitting area canola fields in high numbers – remember to scout! Economic thresholds and scouting details were highlighted in last week’s Crop and Pest Report. Canola is in the 2nd leaf stage, soybean V1 to V2 stages, and small grains have tillered.

Do you have an interest in learning more about beneficial insects and their impact on the farm? NDSU Extension, the USDA Natural Resources Conservation Service, and other area partners are teaming up to present Good Bugs III: Farming with Beneficial Insects for Pest Control – Conservation Biocontrol on Rangeland and Cropland short course. This course will be offered on June 26th at the Burleigh County SCD Menoken Farm. Both courses will begin at 9 am local time and conclude around 4 pm. Registration is $40. Registration is available at www.ndswcs.org. If you have any question, please reach out to TJ Prochaska at travis.prochaska@ndsu.edu.

TJ Prochaska
Extension Cropping Systems Specialist
NDSU North Central Research Extension Center

NORTHWEST ND

Most farmers in the Northwest wrapped up seeding last week and are switching over to in-crop spraying. Warm weather last week encouraged development of crops that were already emerged and helped later planted crops get out of the ground quickly. High temperatures dropped from the 80’s to the 60’s over the weekend and cooler temperatures are forecast through mid-week with highs in the 80’s possible Thursday and Friday. Scattered showers moved through the area on Saturday, but generally dropped less than 0.25” of rain. Next weekend there are low chances of scattered showers, but no major rain is forecast in the coming week. The top soil is dry and spotty emergence is an issue in places.

The northwest is getting dry and needs a good rain to help crops get off to a good start.

There will be an on-farm field day on pipeline reclamation with perennial forages north of Ray, ND on Thursday, June 20th from 10:00 am to 12:00 pm. Topics will include species selection, basic alfalfa management, and using water infiltration to monitor soils. The field site is located at the intersection of 117th Ave NW and 70th St NW on the south side of the road. Directions from the Ray Cenex gas station are: 7 mi north on County Rd 17, then 1 mi west on 70th St NW. This event is free and open to the public. No registration is required. If you have questions about this event, please call Clair Keene at the Williston Research Extension Center 701-774-4315.

Clair Keene
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

NORTHEAST ND

Flea beetle populations are crashing downward now. I can find a few flea beetles foraging in the canola plots at the LREC. Measurable precipitation of 0.69” to 2.11” came to Ramsey, Pembina, Grand Forks and Walsh counties to alleviate dry soil concerns for those farmers and ranchers. Dry soil conditions are a concern in Rolette, Towner, Benson, parts of Nelson counties and adjoining areas. Row crops are at early stages of development. Weed control in small grains is a focus this week in the region.

Lesley Lubenow
Area Extension Specialist/Agronomy
NDSU Langdon Research Extension Center
SOUTH-CENTRAL/SOUTHEAST ND

According to NDAWN, the region’s total rainfall during May 1 through June 10 ranged from 1.6 inches (Carrington) to 4.2 inches (Oakes). Rain to replenish topsoil moisture would be welcome in much of the region to aid late-planted crop establishment. In general, it appears established crops survived the June 7 high temperatures and winds, though there was soil erosion.

Alfalfa has reached the bud to early flower growth stages. Winter rye is in the heading to flowering stages. Spring crops seeded during late April are jointing and early May planted corn is in the 3- to 4-leaf stages. Row crop planting continues, including corn. Early planted soybean is in the first to second trifoliate (V1-2) stages.

Upcoming Carrington REC crop schools and tours:
* Crop Management Field School - June 19
* Field Day - July 16
* Row Crop tour - August 29

SOUTHWEST ND

Many are out spraying weeds. Wheat planting should be wrapped up for the most part and sunflower should be complete by the end of the week.

There have been some scattered rain events. Small grain growth stage has a fairly wide range in the region with the early planted crop reaching jointing, some fields just emerging, and the majority of the acres in the tillering stage.

The warm weather has allowed most row crops to emerge. While many of you are out spraying fields, be sure to keep an eye out for toxic weeds like houndstongue and black henbane along roadsides and field edges.

A black henbane plant found in Hettinger County blooming with its distinct flowers and potent odor.
WEATHER FORECAST
The June 13 through June 19, 2019 Weather Summary and Outlook

For the second straight week southeastern North Dakota into west central Minnesota recorded temperatures above average for the time of year. Elsewhere, temperatures were near average with locations near the North Dakota/Montana border recording cooler than average temperatures (Figure 1). That cooler air in the western part of the North Dakota Agricultural Weather Network (NDAWN) pushed through the rest of the region earlier this week and cooler than average temperatures look to be sticking around for at least another week.

That transition from the warmer temperatures of last week to our current cooler weather triggered off some showers and thunderstorms, especially on Friday and Saturday. Almost all NDAWN stations recorded at least some precipitation during that stretch with parts of northeastern North Dakota and northwestern Minnesota recording the most widespread, heavier rain (Figure 2).
The upper-level wind has now shifted to a northwest flow, meaning the main Jetstream is coming from the prairie provinces of Canada through our area. This leads to a ridge over the western part of the North American continent and a trough in the east. Therefore, from the Rocky Mountains and westward, temperatures will be mostly above average and the southeastern part of Canada and the eastern part of the United States will see mostly below average temperatures. That leaves our region in the middle. In the short term, the next couple of days we will experience a brief warmup, but then cooler air will once again dominate our weather. Although an isolated shower could pop up on any day, the most widespread rain threats will occur with the change back to cooler air that will be moving in this weekend, especially Saturday and again next Tuesday as the warmer air returns.

There will be some exceptions on Thursday and Friday, but overall, most of the next seven or more days will record below average temperatures. My projected growing degree days (GDDs) for the next seven days for Base 50°, 44° and 32° is presented in Figure 3. Almost all locations will be recording noticeably fewer GDDs this week than what was recorded last week.
Using May 5 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
Using May 15 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 since May 15, 2019](image)

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