North Dakota State University
CROP & PEST REPORT

NDSU EXTENSION

No. 2 May 6, 2021

Inside this Issue...

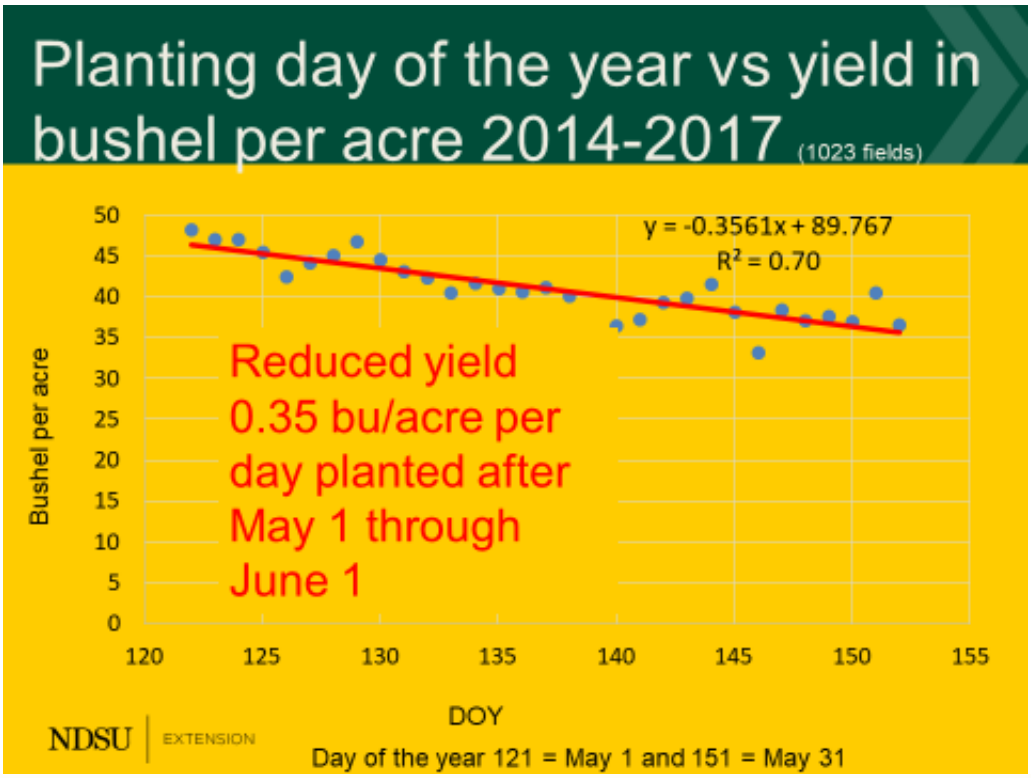
plant science

EARLY SOYBEAN PLANTING CONSIDERATIONS

Soybean seeds take up water within the first hours after planting (imbibition period), if soil moisture is available, and will usually complete the initial water uptake within the first 24 to 30 hours. During this period the soil temperatures where the seed is placed, should not be cooler than about 45°F. Therefore it is important to avoid planning soybean seed if cold rain or cold temperatures are expected within 24 hours of planting. The imbibition phase is a temperature-sensitive period where fast water uptake results in the hydration of the cells in the seed. If the seed takes up very cold water, chilling damage (seed injury), and potentially lower plant stand may occur as a result. After the imbibition phase, the risk of chilling injury ends. Research has indicated that the quality of the seed (cracked seed coats), seed moisture (less than 13%) at seeding, variety and soil moisture (dry, moist, or saturated soil) all influence chilling injury risk as well. When possible, plant soybean in the warmer part of the day or when air temperatures are predicted to increase. Soil temperatures can be measured in the field with a thermometer or obtained from NDAWN weather station sites soil temperature reading at http://cloud.ndawn.org.

NDAWN Center
North Dakota Agricultural Weather Network

After the initial imbibition period the seeds take up water by osmosis. Seeds and seedlings in this phase are tolerant of soil temps as low as 35-40°F. Temperatures below 50°F will lengthen the period from imbibition to emergence. Seed laying in cool soil for extended periods have an increased risk for soil-borne diseases, especially when the soil is also wet. Fungicide seed treatments can be used to prevent diseases and typically result in a higher percent established plants, compared with no treatment. During cold conditions, seed growth and development are usually delayed until soil temperatures warm up.



A large North Dakota grower study, with over 1000 reported observations, indicates that there is a reduced yield potential of about 0.3 bushel per acre per day, when planting is delayed between May 1 and May 31 (graph). Also, NDSU research indicates a 9-trial average yield increase of 8% with soybean planted during the first 10 days of May or earlier versus the last half of May. This information about early planting should be interpreted with some caution. The recommendation is that the field soil condition is adequate for planting, the soil temperatures are conducive (around 50°F), the weather forecast is favorable, and the risk of frost after germination is low. It typically takes 10 to 15 days for early planted soybean to germinate (depends on the moisture availability and temperature), so planting can be done before the last predicted frost. Knowing the long-term average last frost day in the spring for your county and the average date of first frost in the fall can help in managing risk. The cost-benefit of potential higher yield for early planting must be weighed against the risk for potential frost damage.

Hans Kandel
Extension Agronomist Broadleaf Crops

WATER: IS THERE A PROBLEM WITH TOO MUCH OR TOO LITTLE?

For North Dakota and Northwestern Minnesota, the above average precipitation pattern that started in 1993 resulted in unproductive areas along headlands and road-side or in-field ditches. However, recent dry weather is not helping these issues either (Figure 1, next page). We need more rain in sufficient quantities to force excess salts deeper into the soil to remediate salinity and to dissolve soil amendments such as gypsum to remediate sodicity.

Figure 1. April 29, 2021. An unproductive headland with excess salts and potential sodicity issues along state Highway-5 East in Cavalier County, N.D.

Most unproductive areas have moderate to high levels of water soluble salts (measured by analyzing electrical conductivity). Apart from salt issues, these areas either have high levels of sodicity (measured by analyzing sodium adsorption ratio) that causes breakdown of soil aggregates or high magnesium levels compared to calcium causing excess swelling of soils. These issues affect plants and soils resulting in unproductive areas and net loss of revenue.

Water is essential for all living beings including plants and soils, however, too much or too little water creates challenges. The wet cycle resulted in shallow groundwater depths, saturated soils and brought excess water-soluble salts and sodium (Na^+) causing sodicity in topsoil. Whereas, dry weather increases evaporation, which results in greater wicking of groundwater, salts and sodium leaving deposits on the soil surface. Since 2017, the weather pattern started getting drier, excluding the wet fall of 2019, and currently we have drought conditions. We did not feel it in 2017 as the 2016-fall was very wet. In 2020, again we had carryover groundwater from the fall rains in 2019. However, not only was last fall dry but so far this spring has been dry as well. Dry weather is the reason saline and sodic areas are very prominent, widespread and increasing during the last two-years compared to the recent past. These areas keep growing and reduce productivity of once fertile soils. In addition, lack of plant growth increases erosion as topsoil blow away. It is dollars directly out of producer's pocket when the precious fertile topsoil blows away.

Planting Suitable Salt-tolerant Plants

It is not in our control how much rain we will get and when, however, we can establish salt-tolerant annual crops or perennial grasses to reduce evaporation and wicking up of groundwater, salts and sodium into topsoil. Planting cash crops such as wheat, canola, corn or soybean on these saline-sodic areas will likely result in poor stands. According to the NDSU projected 2021 crop budgets for NE North Dakota, the average cost of seed, fertilizer and one third fuel and lubrication to plant one acre of spring wheat is $108.46. For canola, it is $147.61 per acre for the same inputs, whereas, for corn and soybeans the input cost is $176.12 and $82.16 per acre respectively. However, when soil saturated paste electrical conductivity or EC is close to 4.0 dS/m and sodium adsorption ratio or SAR is around 7.0, these crops generally do not do well and planting salt-tolerant crops such as barley and oats may produce better results. As per a research trial conducted at the NDSU Langdon Research Extension Center in 2020, barley and oats produced high yields when 0-6 inch depth soil EC was 3.99 dS/m with a SAR of 7.12. However, at a EC of 7.80 dS/m and a SAR of 18.13 for the same soil depth, there were 75 and 65 percent yield reductions across the board for barley and oat varieties respectively (Figure 2 and 3).

Figure 2. Barley and oat varieties growing at an EC of 3.99 dS/m and SAR of 7.12 in the 0-6 inch soil depth on July 28 and September 15, 2020.

Figure 3. Barley and oat varieties growing at an EC of 7.80 dS/m and SAR of 18.13 in the 0-6 inch soil depth on July 28 and September 15, 2020.

However, once soil EC is 5.50 or more and SAR is 10.00 or more, it is best to plant perennial salt-tolerant grasses. Once established, they can be hayed or grazed to generate some profit from these currently unproductive areas. Salt-tolerant perennial covers will also minimize wicking up of groundwater, salts and sodium and will minimize blowing of topsoil. These grasses will grow at EC levels ranging from 14.0 to 26.0 dS/m. Strips could be 30 to 50 feet wide along the headlands, road-side or in-field ditches (Figure 4). 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, haying or grazing. Mix includes Tall, Western, Slender, Green (AC Saltlander) Wheatgrasses and Russian Wildrye at 1.5 to 1.6 pounds of each grass per acre. If the strips are adjacent to a native rangeland, then Green Wheatgrass (AC Saltlander) should not be included in the mix and instead seeding rate for the other four species should be increased to 2 pounds per acre. That is suggested as AC Saltlander is a cross between bunch and quack grasses and is rhizomious. This can lead to being invasive. In addition, 1 to 2 pounds of a winter-hardy alfalfa variety can be added to the grass mix. It has been observed at two sites, that alfalfa started establishing three-years after planting. That, however, may not work at all sites. There are two optimum times for planting these grasses: early to mid-May and dormant planting in October.

By planting strips of these mixes, white saline areas can be contained. Also, this remediation strategy may take three to five years or even longer if dry weather persist. Producers can either mow these strips, sell as hay or graze them. In addition, by planting these strips onto these saline and sodic areas, 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, under drier weather even after establishing these strips, these area may still be one of the worst as there will not be enough rain or snow melt to push the salts and sodium out of the root zone despite lower groundwater depths. Water caused these issues and water will help with remediation. With established perennial salt-tolerant covers, however, remediation of these areas will still continue.

Figure 4. April 29, 2021. Established salt-tolerant perennial grass strips on both sides of an in-field ditch along state Highway-5 East in Cavalier County, N.D.

There are few more strategies that could be considered as management options:

- Tiling entire fields is often considered as a first-option to lower salt levels. However, under dry weather groundwater depths lowers naturally and there is no need for most of these areas to be tiled. In addition, research has shown that salt levels increased under dry weather on tiled land. It will make more sense to tile these areas once weather pattern starts getting wet again.
- Soil amendments such as gypsum that are applied to remediate sodicity will also require decent rain to get dissolved and add free calcium (Ca^{2+}) to the soils. Under dry weather, that process will be very slow.
- In case of not planting salt-tolerant annual crops or perennial grasses, some weed species may grow on these saline-sodic areas. If managed properly, weeds can be mowed before they go to seed to reduce evaporation.

Naeem Kalwar
Extension Soil Health Specialist

Dr. Thomas F. Scherer
Extension Agricultural Engineer

plant pathology

BEST MANAGEMENT PRACTICES FOR HIGHEST RETURNS IN SUGARBEET

Select your best fields for sugarbeet with highest preference going to a previous crop of wheat. Ensure there is proper drainage or else the environment will be favorable for soil-borne diseases later in the season. Prepare a friable, weed-free seedbed and fertilize in the fall or spring based on a soil test.

Select seed varieties with high recoverable sucrose potential that is suitable for your production area. When ordering seeds, make sure seeds are treated with fungicides such as Kabina, Systiva and Vibrance that will give protection against Rhizoctonia damping-off. Add an application of Tachigaren which is an inexpensive insurance against Aphanomyces damping-off. Most seeds include insecticidal seed treatments that will control common insect pests such as sugarbeet root maggot and wireworms. Fields in an area with a history of sugarbeet root maggot will also need a granular insecticide at planting as well as protection just before peak fly activity.

Plant seeds about 4½ to 4 5/8 inches apart to get about 175 to 200 evenly spaced plants per 100 ft of 22 inch rows; plant closer in 30 inch rows.

Weed control options are somewhat limited in sugarbeet so has to be careful and strategic. Since all growers use crop rotation, it is recommended to use herbicides that are more available in rotating crops such as wheat, corn and soybean to control herbicide resistant weeds. In the sugarbeet crop, start weed control early – start with a weed free seed bed, use a pre-emergent or soil incorporated herbicide where possible. For post emergent herbicide applications, start when weeds are small and continue until row closure; if necessary, use mechanical weed control and/or labor to keep the weed seed population as low as possible.

Select varieties that will perform well in fields with a known cropping history. For fields with a history of Rhizoctonia, use a Rhizoctonia resistant variety and apply fungicides such as azoxystrobin in a timely manner to provide early season protection. After row-closure, fields should be scouted for Cercospora leaf spot (CLS) since the population of the causal agent, *Cercospora beticola*, is very high. Apply fungicide mixtures starting at first symptoms or when the disease is first reported in the factory district. It is best to mix fungicides with two modes of action and apply in 20 gallons of water per acre at 14 day intervals in dry conditions and at 10 to 12 day intervals during wet conditions. The crop should be protected from CLS until harvest starting in October. By following best management practices, growers should prepared to harvest a high yielding and high quality sugarbeet crop.

Mohamed Khan
Extension Sugarbeet Specialist
NDSU & U of MN
701-231-8596

FUNGICIDE SEED TREATMENTS IN WHEAT

With over 40% of the spring wheat crop seeded in the state (and some starting to emerge), one may be trying to determine if a fungicide seed treatment promoted better stand establishment, or perhaps if a fungicide seed treatment is needed on kernels that have yet to be seeded. First, fungicide seed treatments are most effective managing seedborne diseases such as loose smut, and can occasionally improve germination in Fusarium infected (scabby) seed lots (depending on severity of infection). Additionally, there are several fungicide seed treatments labeled for suppression of the three primary root rots of wheat in North Dakota (Fusarium root, crown and foot rot, common root rot, and Pythium root rot), and information can be found in PP622 or in the NDSU Extension Pest Management App. You will notice that most labeled seed treatments have more than one mode of action to help manage and suppress diseases that occur as a complex. For example, a field may have multiple root rot pathogens present such as *Pythium* and

Fusarium (Figure 1). Therefore, it would be necessary to have a fungicide seed treatment with multiple modes of action with one having efficacy on *Pythium* (such as FRAC 4 or 22) and one having efficacy on *Fusarium* (such as FRAC 3, 7 or 11).

Figure 1. Wheat root discolorations caused by one or multiple pathogens.

Stand Response – Overview of Research conducted from 2003-2020

Beginning in 2014, I have compiled and analyzed data from replicated wheat seed treatment experiments that have been conducted by NDSU personnel. These experiments were primarily conducted at five locations: Carrington, Dickinson, Fargo, Minot, and Mott. I reported findings two years ago and now have updated the data set to include 46 field trials conducted from 2003-2020. Specifically, I have analyzed the difference (stand response) between a fungicide seed treatment and a non-treated control (naked seed).

When combining data from all experiments, an average stand response of 8.4% was observed when a fungicide seed treatment was used (Figure 2, next page). Additionally, 72% of the fungicide seed treatment data points were positive (greater than zero). Given that trials were conducted in vastly different growing regions, the data was divided into east and west regions. Results indicated that the average stand response from a fungicide seed treatment in the west (Dickinson, Minot and Mott) was 9.9% and the east (Carrington and Fargo) was 7.4%. This data indicates that a favorable stand response is generally observed when a fungicide seed treatment is used; however it is difficult to quantify this effect on yield.

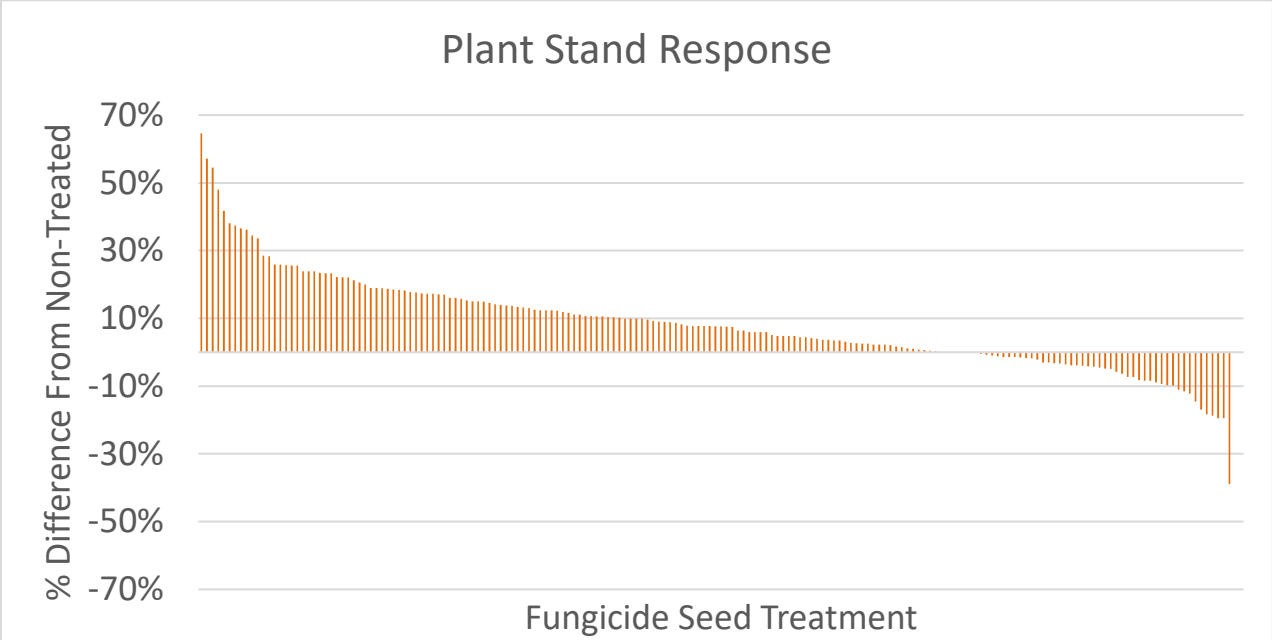


Figure 2. Percent stand differences between fungicide seed treatment plots and non-treated plots across 46 replicated fungicide seed treatment experiments.

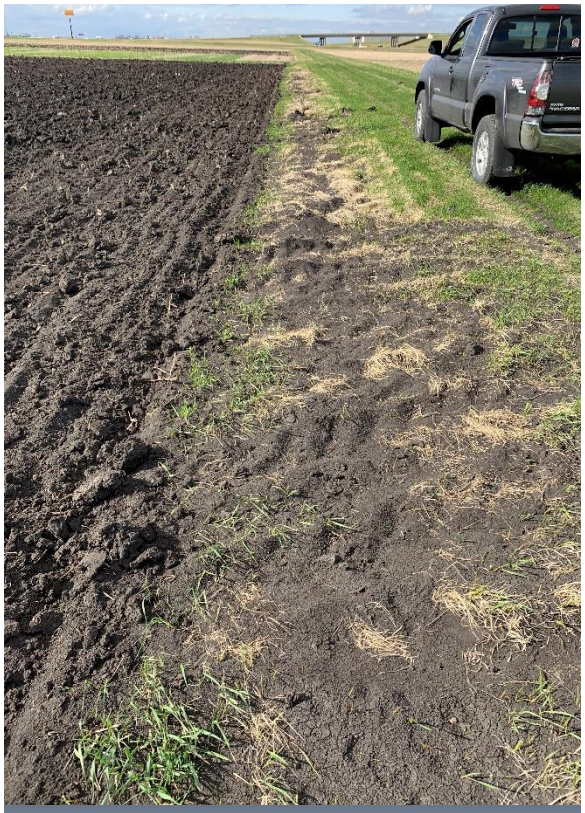
Andrew Friskop
Extension Plant Pathology, Cereal Crops

weeds

WEED SEED IN WIND-BLOWN SOIL

The wind erosion events in late March and early April certainly caused a lot of coffee shop and Twitter talk for a number of good reasons worth discussing. The Weed Scientist in me couldn't help but think, how many weed seeds are moving with all that soil? Whenever we typically discuss wind-dispersed seed, we are usually talking about seed with a pappus (like dandelion of marestail), or the tumbleweeds (kochia and Russian thistle). However, the sheer amount of soil that was relocated certainly brought some weed seeds along for the ride.

I recently visited some of the research plots near campus that were victims of the wind erosion events over the last few months. We had a few areas where freshly blown Fargo clay accumulated on top of long-term perennial grass, much like many ditch banks in the region. I barely set foot out of my truck before seeing a fresh mat of summer annual seedlings. Common lambsquarters, wild buckwheat, common mallow, wild mustard, and common ragweed could all be found in a relatively small area next to the field. I have no doubt in my mind that waterhemp and some grasses will start emerging from that area soon. The bottom line is that these erosion events have also moved a tremendous amount of weed seed around. Keep this in mind as fields get scouted for weeds later this spring and summer. Just because you may have never had a weed like waterhemp in your field before, this doesn't mean you haven't acquired a new weed problem from the soil that blew in.



Field soil blown onto perennial grass on field edge. Many fields experienced more soil movement than the field in this picture.

Common lambsquarters seedling in wind-blown soil. The grass pictured is covered by several inches of topsoil.

HERBICIDE SUPPLY CONCERNS IN 2021

By now I am sure that most readers of Crop and Pest Report are aware of the supply concerns of certain herbicides this spring. There are many different issues that have culminated in the tight supply of some agricultural chemicals. There are supply chain issues related to closures and reduced work forces in facilities due to COVID-19, cardboard and plastic shortages, power shutdowns at manufacturing plants in Texas during their cold snap, a shortage of truck drivers, and if I'm a betting man then the Suez Canal blockage probably didn't help this situation.

To date, glyphosate and glufosinate have received most of the attention for tight supply chains, and for good reason – they are used on a lot of acres across the US and world. A lot of generic glyphosate and glufosinate also gets manufactured overseas, which certainly does not help in getting product into our hands. Recently, I have received some feedback that Huskie also seems to be difficult to find. Those are the top three herbicides I have heard about with

regards to shortages or tight supplies, but it is not an exclusive list. There may be additional products with tight supplies as the season progresses.

My main goal in raising awareness on this issue is that I want everyone to be thinking ahead about their chemical needs. Plan A may be difficult to find and/or pricier than expected. If you don't have the herbicides you want to apply on hand, please talk with your supplier and chemical reps to try and secure the product. Some may need to have a Plan B if these supply issues persist into the spray season. Reports across the state indicate that weeds are off to a slow start this year due to the drought, but they will eventually rear their ugly heads, and we need to make sure we have the chemicals on hand to control them.

Joe Ikley
Extension Weed Specialist

IT HAS NOT RAINED. WHAT IS THE FATE OF MY PREEMERGENT SUGARBEET HERBICIDES?

Sugarbeet growers use soil residual herbicides at planting to control kochia or waterhemp. Ethofumesate applied at 2 to up to 5 pt/A controls early season waterhemp and ethofumesate at greater than 5 to 7.5 pt/A controls kochia in sugarbeet. Growers often mix Dual Magnum at 8 fl oz/A with ethofumesate at 2 pt/A in sugarbeet fields planted after April 20 since Dual Magnum takes less precipitation for activation and is readily available for control of early emerging waterhemp. The question on producers' minds is what is the fate of either ethofumesate or Dual Magnum in fields that have receive no or trace amounts of rainfall?

Volatility (evaporation), adsorption, and soil moisture effect soil-applied herbicides. Volatility is the change in herbicide physical state, from a liquid to a gas. Most soil-applied herbicides used by farmers have a medium or low vapor pressure meaning they are attached to soil colloids and generally will not volatilize during warm and dry conditions. However, herbicides may move with blowing soil and impact efficacy. Adsorption is the attachment of herbicides to soils. Herbicides must be bound to soils or they are easily leach out of the seedling zone. Most herbicides are moderately or strongly bound to soils colloids and should not be impacted by our dry conditions.

Soil moisture (and rainfall) affects soil-applied herbicides in two ways. First, rainfall moves the herbicide from the soil surface and into soil. Second, rainfall contributes to the amount of herbicide available for absorption by weeds. While 'half an inch' is a good rule of thumb to activate herbicides, soil moisture conditions at or after the time of soil-applied herbicide application will influence herbicide activation. Rainfall must first wet the soil surface before water and the herbicide can move into the soil profile under dry conditions. Additionally, herbicides bind more tightly to soils and are less active for weed control in dry conditions. Thus, under our dry conditions, it might take more than 0.5 inch of rainfall for satisfactory levels of activation and resultant weed control. But on the other hand, your herbicide should be 'there' and available for activation once we get rain...provided the soil does not blow.

Ethofumesate or Dual Magnum have not degraded and are likely bound to surface soil. Where do they need to get and how are they taken up by waterhemp and how much time is left before waterhemp emergence? Dual Magnum and ethofumesate are herbicides inhibiting very long chain fatty acids (VLCFA) and are used preemergence or with shallow soil incorporation to control waterhemp. The VLCFAs affect waterhemp before emergence, but do not inhibit waterhemp seed germination. Likewise, VLCFA due not control emerged plant although we occasionally seed evidence of 'reach-back' with ethofumesate. The primary site of absorption and action of Dual Magnum (called a chloroacetamide herbicide) on waterhemp is the roots. Ethofumesate (called a benzofuran herbicide) are absorbed from the soil solution through both waterhemp roots and emerging shoots. The VLCFAs are not readily translocated in the plant, so herbicide placement and availability are important.

While both herbicides need to be in the seedling zone, there is more flexibility with ethofumesate since it is absorbed through both roots and shoots. However, Dual Magnum is more water soluble than ethofumesate meaning it takes less rainfall to incorporate Dual Magnum into the seedling layer. Since ethofumesate is more water insoluble, it lasts longer in the soil than Dual Magnum. We think Dual Magnum will be active in the soil for 2-3 weeks while ethofumesate will be active in the soil for 4-5 weeks.

We are unaware of any waterhemp germination and emergence in Minnesota or North Dakota at writing. Waterhemp emergence has been linked to growing degree days and soil temperature. We have not accumulated many growing degrees days and the soil remains cool. Matter of fact, agriculturalists and consultants report very little weed emergence at writing.

Tom Peters
Extension Sugarbeet Agronomist
NDSU & U of MN

around the state

AROUND THE STATE

NORTH CENTRAL ND

In north central region we had some rain last week, but the dry pattern and the extreme drought condition has been sustained in most part of the region. Topsoil moisture is low and as expected, we have observed higher soil moisture in cropping systems with more residue in the soil surface (Figure 1). The pictures were taken on May 3 and the rainfall received in the fields (50 yards apart) was the same. The planting activity increased since last week, mostly for pulses, canola and small grains. Some producers have reached us expressing their concerns regarding surface broadcasted urea and dry conditions, given that some of those experienced more than seven days without rain after the urea application. Fortunately, the rain observed last weekend might helped to alleviate their concern.

The North Central Research Extension Center's (NCREC) research trials are moving on with pulses, canola and small grains. In the days to come with the increase of the soil and air temperature corn and soybean will start to be planted. We have observed the follow precipitation reports by NDAWN stations since the start of April: Minot: 0.35"; Bottineau: 0.22"; Garrison: 0.23"; Karlsruhe: 0.64"; Mohall: 0.61"; Plaza: 0.15"; and Rugby: 0.13". The average soil temperature at the NCREC since May 1st appears to be in the low to mid 50's (degrees F). We have seen perennial weed (dandelion) regrowing and a few spring annuals including kochia emerging in the field.

Figure 1. Crop sequence (wheat left, soybeans right) x soil moisture

TJ Prochaska
Extension Crop Protection Specialist
NDSU North Central Research Extension Center

Leo Bortolon
Extension Cropping Systems Specialist
NDSU North Central Research Extension Center

NORTHWEST ND

With warmer temperatures last week, planting pace picked up in the Northwest. High's in the 80's on Friday and Saturday made for nice planting weather, but have farmers worried about what little soil moisture there is evaporating even faster. A few scattered showers moved through Monday and today, but most places received less than 0.1". High's the rest of this week are predicted to be in the 60's with chances of scattered showers over the weekend. The region is still extremely dry and in desperate need of good rains. With the dry conditions, planting is progressing as quickly as farmers can seed with no delays due to rain or wet soils. It will be wait and see before we know if seeded crops have enough moisture to emerge.

Clair Keene
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

SOUTH-CENTRAL/SOUTHEAST ND

Crop planting is rapidly progressing but plant establishment continues to be slow due to cool air and soil temperatures, and generally dry soils. According to NDAWN, rainfall April 1 through May 3 ranged from 0.2 inch (McHenry) to 1.7 inches (Lisbon) with numerous sites under 0.5 inch and 0.6 inch at the Carrington Research Extension Center (CREC).

Alfalfa regrowth at the CREC is at ≤4-inch height. Winter rye and winter wheat are in the seedling to tillering growth stages. Small grain planting in the region should soon be complete. Early April planted small grain have emerged during the past week and are at 1-leaf (see picture). Estimates on planting progress as percent of acres for corn ranges from 30-50% and soybean at 20-30%.

Using data from a multi-year CREC corn study, the plant population (with hybrids of 83- to 85-day relative maturity) that gives maximum economic return based on seed costs of $200-225/unit (80,000 seeds) and market price of $5/bu is 33,500 to 34,000 plants/A. Reference tables and additional study results can be found at: https://www.ag.ndsu.edu/carringtonrec/center-points/2018/corn-plant-populations-revisited

May 3 growth of durum wheat planted at the CREC on April 9

Greg Endres
Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center

SOUTHWEST ND

We need moisture. Some early planted crops are beginning to emerge after sitting in the ground for a month. We've received some small shots of rain, but more is needed. Winter annual crops look very rough between lack of moisture and wind damage. A lot of anhydrous being moved around, be sure to be patient and safe on the roads.

Ryan Buetow
Extension Cropping Systems Specialist
NDSU Dickinson Research Extension Center

weather

WEATHER FORECAST

The May 6 to May 12, 2021 Weather Summary and Outlook

In the past week the Wolverton, Minnesota North Dakota Agricultural Weather Network (NDAWN) station recorded a high of 90° on Saturday, May 1 and on Wednesday, May 5 parts of central and southeastern North Dakota recorded some late season snow. The "joys" of spring in this area. That transition from the warmth to the cold did bring some rain Sunday into Monday, plus the snow previously mentioned was associated with a weak disturbance that brought moisture into some parts of the region as well. The 7 day totals through 11 AM, Wednesday, May 5 is presented in Figure 1.

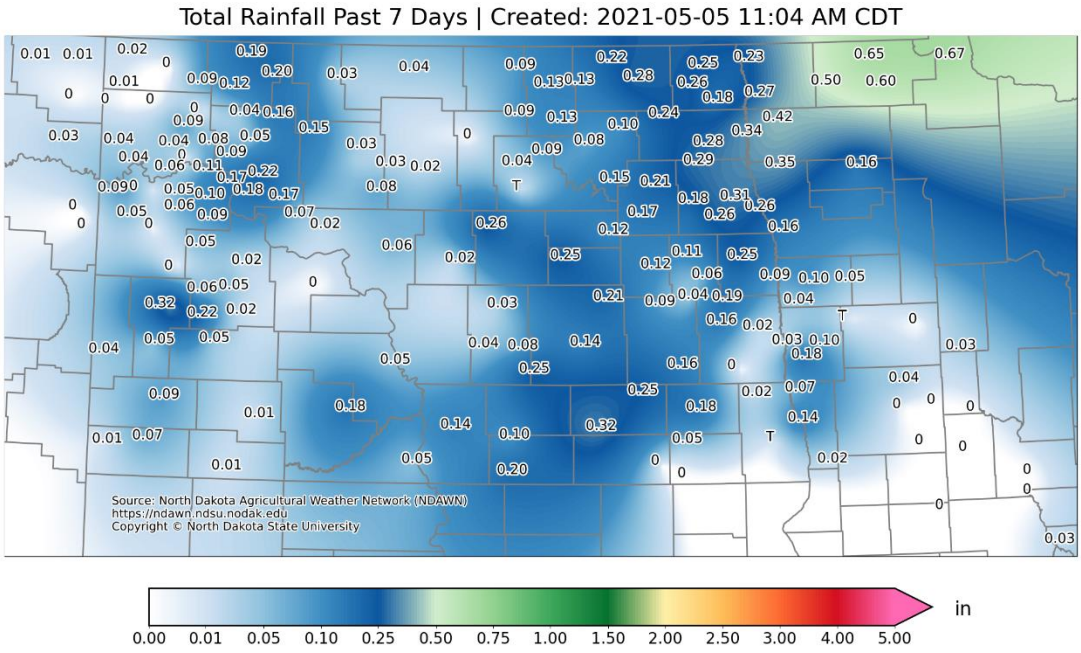


Figure 1. 7 Day (168 hours) Rain Totals at NDAWN station through 10:00 AM, Wednesday, May 5, 2021

Taken as a whole, this past week was near average with none of the days near the average as most of the time we were either well above or below normal (Figure 2).

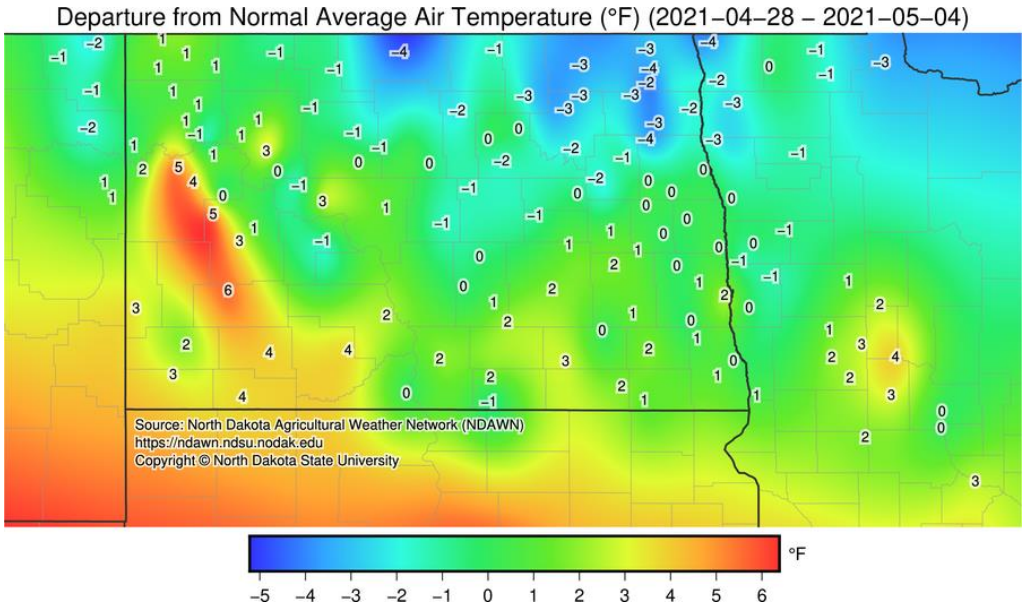


Figure 2. Departure from Average temperature at selected NDAWN weather stations for the period of April 28 through May 4, 2021.

There is an upper-level low near Hudson Bay that is retrograding (moving east to west) toward North Dakota. That upper-level low is blocking the warmer air to our west and southwest from moving back into the Northern Plains. It will take a few more days for this pattern to break. Meaning, there will be a day or two with temperatures at least near normal, but overall it looks like we will have to wait another week to see a longer term warm up. This will also mean there will be several frost or freeze threats in the next week. The best chance of precipitation in the next week will be Saturday mainly in areas along and west or south of the Missouri River. That blockage in eastern Canada will probably not allow that moisture to move into eastern North Dakota. Yet, on a positive note that atmospheric block may allow the rain to linger in western North Dakota a bit longer increasing the odds of higher rainfall totals in locations that are currently the driest.

The projected growing degree days (GDDs) base 32° for the period of May 6 through May 12, 2021 can be found in Figure 3. Because of the continued below average temperatures, only Base 32° is being projected this week.

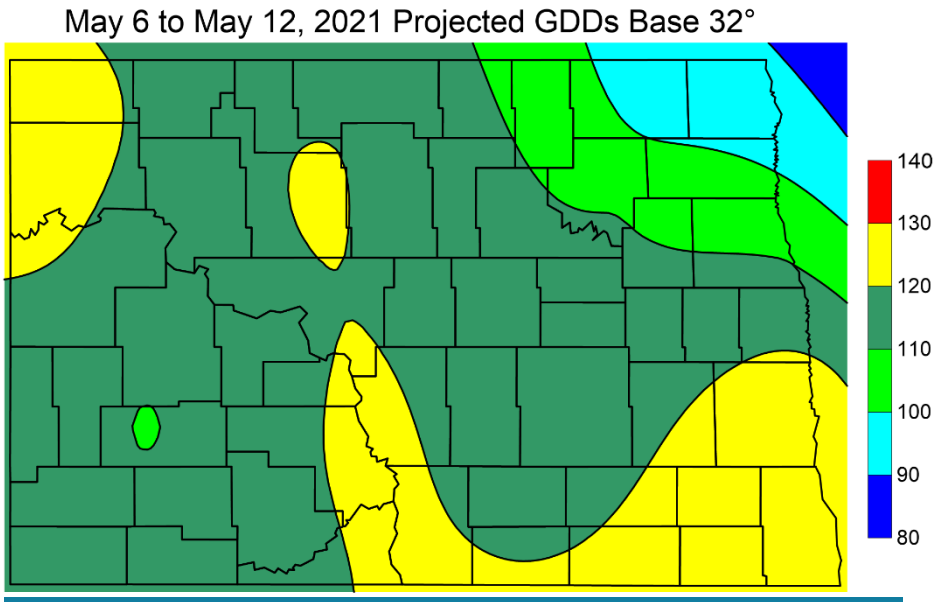


Figure 3. Projected Growing Degree Days, Base 32° for the period of May 6 to May 12, 2021

Daryl Ritchison
Meteorologist
Director of the North Dakota Agricultural Weather Network

North Dakota State University
CROP & PEST REPORT
NDSU Dept. 7660; PO Box 6050
Fargo, ND 58108-6050

Crop and Pest Report is on Facebook!
Ctrl + Click image below or go to www.facebook.com/ndsuextcpr to 'Like' us and receive notifications and other information.

Not on the List to receive this report?
Sign up now with your smart phone using the code to the right:

Janet Knodel
Co-Editor

Entomology
701-231-7915

Plant Sciences
701-231-7971

Soils
701-231-8881

Sam Markell
Co-Editor

Plant Pathology
701-231-7056

Weeds
701-231-7972

Ag Engineering
701-231-7261

NDSU EXTENSION

EXTENDING KNOWLEDGE ❯❯ CHANGING LIVES

This publication will be made available in alternative formats for people with disabilities upon request (701) 231-7881.
This publication is supported in part by the Crop Protection and Pest Management Program [grant no. 2017-70006-27144 / accession 1013592] from the USDA National Institute of Food and Agriculture.