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controlled drainage video

Every spring NDSU Extension organizes a tile drainage design workshop. As a resource, a video with educational talk is providing information about controlled drainage, control boxes, and how water table control can be utilized in an agricultural field.

Additional drainage water management training videos can be found at the transforming drainage web site. A great explanation about controlled drainage system design is provided by Gary Sands, Extension engineer, University of Minnesota.

NDSU Extension Dry Bean Production videos

Dry edible bean producers and crop advisers have an opportunity to learn about North Dakota State University’s current production research and recommendations from Extension’s Getting-it-Right in Dry Bean Production webinar video’s. The six presentations have been posted on the Carrington Research Extension Center website.

The topics available are:
Hans Kandel: Market type and variety selection
Greg Endres: Plant establishment factors, row spacing, populations, planting date, tillage systems, and ground rolling.
Dave Franzen: Plant nutrition: Field selection; N, P, K, S and Zn; fertilizer application timing and placement.
Sam Markell: Plant protection: Disease management including rust, bacterial blights and white mold (Sclerotinia).
Joe Ikley: Weed management including Palmer amaranth and soil-applied herbicides.
Frayne Olson: Dry bean marketing.
NDSU Extension Soybean Production Videos

North Dakota State University Extension faculty discussed past soybean research conducted in North Dakota and the outlook and production issues for 2020. The videos provide information about all the major production decisions, which have to be made in order to grow a soybean crop.

Western Soybean School: Getting it Right webinar.
Chris Augustin: Soybean fertility and soil interactions.
Greg Endres: Soybean overview—planting to harvest.
Sam Markell: Soybean disease diagnostic series review.
TJ Prochaska: Insects in soybean, what to look for.
Joe Ikley: Learning from the east, weed management in soybean.

Hans Kandel
Extension Agronomist Broadleaf Crops
Greg Endres
Extension Cropping Systems Specialist
NDSU Carrington Research Extension Center

PLANTING SMALL GRAINS AND CORN - 2020
Optimum Seeding Dates of Small Grains

Due to unfavorable soil and weather conditions, planting has just now started and only in some regions of the state. As of April 26th, only 5% of the spring wheat area and 2% of the barley area had been planted, compared to 18% and 13% for the five-year average. Planting small grains early in the season is considered desirable, as it allows these cool season crops to grow when temperatures are more favorable to the development of high yield. Table 1 summarizes our current recommendations for optimum seeding dates for small grains. These dates are based on trials conducted at Research Extension Centers averaged over multiple years. Yield losses are estimated to be 1% per day after the optimum recommended planting date. Nevertheless, when looking at data USDA data for the entire state, I found little relationship between when 50% of the spring wheat was planted and yield. As an example, last year we reach 50% the spring wheat crop planted on May 15th, about 5 days later than the average of the past 10 years, yet the statewide yield was 49 bu/acre, well above the average yield for the same period. Planting date alone is obviously not the only determinant of yield in a state where drought stress is common. In most seasons, planting on or before the recommended optimum date will enable higher yield potential than when planting later.

<table>
<thead>
<tr>
<th>Location</th>
<th>Optimum date</th>
<th>Last Planting Date</th>
</tr>
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<tbody>
<tr>
<td>South of Hwy 13 and 21 &amp; north of SD border</td>
<td>2nd week of April</td>
<td>2nd week of May</td>
</tr>
<tr>
<td>South of I-94 &amp; north of Hwy 13 and 21</td>
<td>3rd week of April</td>
<td>3rd week of May</td>
</tr>
<tr>
<td>South of U.S. Hwy 2 &amp; north of I-94</td>
<td>4th week of April</td>
<td>4th week of May</td>
</tr>
<tr>
<td>South of Canadian Border &amp; north of Hwy 2</td>
<td>1st week of May</td>
<td>1st week of June</td>
</tr>
</tbody>
</table>

Optimum Seeding Rates of Spring Wheat

I occasionally get questions about the optimum seeding rate of new wheat varieties. After several years of research on the potential interaction between varieties, seeding rates and environments, the answer is, unfortunately, it depends. The optimum seeding rate can vary somewhat from variety to variety but also from environment to environment. I have developed the following guidelines, based on the results of this recent research that I use when formulating seeding rate recommendations: 1- First, it is important to use seed numbers per acre not bushels per acre for the basis of a seeding rate. Seed weight varies considerably between seed lots. If you seed by weight without taking into consideration seed weight, you may be under-seeding or over-seeding without knowing it. Information on the number of seeds per pound can be found on seed tags or can be calculated by counting a thousand seeds, weighing them on a kitchen balance and doing some simple math. 2- Start with a base seeding rate of 1.5 million seeds per acre,
which was the average economic optimum rate over environments and varieties. 3- For environments where yield will likely be less than 50 bu per acre, reduce the seeding rate by 100,000 seeds (i.e. 1.4 million seeds). 4- For varieties that are rated 5 or higher for straw strength, reduce the seeding rate by 200,000 seeds per acre. 5- For higher yielding environments (> 50 bu per acre) and when using a variety with good straw strength that produces few tillers, increase the base rate by 100,000 per acre. These seeding rate recommendations are for the number of live seeds so you will need to adjust for the germination of the seed lot. In our research plots we observed that on average about 15% of the seeds did not establish seedlings. Accordingly, there is no need to adjust seeding rates upward to accommodate seedling mortality, unless for some reason you feel mortality rates will be higher than the 15% mentioned above.

Optimum Seeding Dates and Planting Recommendations for Corn

There was no report of corn planting in the most recent USDA-NASS report. The five-year average for this period is about 7%. The optimum period for planting in corn is during the first two weeks of May. This is narrow window given the likelihood of rain or cold or wet soils precluding planting during some of those days. Over the last 10 year, typically only about 50% of the corn acres are planted by the May 15th; last year we reached the 50% mark on May 23rd. After May 20th, we recommend a switch from a full season hybrid to an earlier maturing hybrid. Last year illustrated the risks of staying with a full season hybrid when planting is delayed, as many late-planted full season hybrids did not reach maturity before the end of the season resulting in low test weights and very wet corn.

Because corn is a warm season crop, it does not grow when temperatures are below 50 degrees. It is not uncommon for soil temperatures to be below 50 degree in early May. Though we accumulate very few corn growing degree days in early May, most seasons planting in early May will result in better yields and an earlier maturing crop than waiting for a period of sustained warmer soil temperatures. The relationship between planting date and final yield for the state is not very strong (Figure 1). Three of the lowest yielding years were those that were planted after May 15. On the other hand, two of the three highest yielding years, 2018 and 2019, were planted on May 20 and May 23, respectively and had yields well above the trend line in this graph. Also, of note is that the final planting date for full insurance coverage for corn in North Dakota is May 25th except for Cass, Ransom, Richland and Sargent counties where the final planting date is May 31st.

One risk of planting in early May is that of imbibitional chilling injury to the seed. This injury can cause reduced stands and variable emergence timing. It most often occurs when the seed imbibes water that is less than 50 degrees shortly after planting. Seeds that are planted into cold soils that do not warm up above 50 degrees during the first 24 to 36 hours after planting, or if planted into soils receives a cold rain or snow shortly after planting.
Placing date is not the only determinant of yield and in fact only explains little of the yield in the above graph. This means that regardless of planting date management and weather after planting will determine ultimate yield. Establishing a uniform stand is a critical practice in developing a foundation for high yield. In addition to soil moisture and temperature, planting speed, and crop residues have been shown to impact corn emergence. Crop residues influence soil temperature (and uniformity of emergence), so make sure trash managers are working and properly adjusted. Seeding depth can also play a role in emergence variability. Seeding at 1.5 to 2 inches is generally recommended, but if the soil surface dries out, don’t be afraid to plant deeper if it places the seed in uniform moisture.

Joel Ransom
Extension Agronomist, Cereal Crops

**PROJECTIONS AND BEST MANAGEMENT PRACTICES FOR 2020 SUGARBEET CROP**

Growers in the US grow and process sugar from sugar cane and sugarbeet. Sugar cane is produced in Florida, Louisiana, and Texas and sugarbeet is produced in Minnesota, North Dakota, Idaho, Michigan, Montana, Nebraska, Colorado, Wyoming, Oregon and California. The United States Department of Agriculture estimates that 1.1385 million acres will be planted in 2020, a small increase in acreage compared to 2019.

North Dakota (ND) and Minnesota (MN) in 2020 have three sugar cooperatives – American Crystal Sugar Company, Minn-Dak Farmers Cooperative and Southern Minnesota Beet Sugar Cooperative. Together, they will plant about 641,000 acres which represents about 56% of the total US sugarbeet production. Producers in the bi-state will increase their acreage in 2020 so that they can increase the amount of sugar kept in stock.

Growers can continue their effort at improving efficiency by ensuring that planting is done in properly prepared and weed-free seed beds, by using adequate seeding rate and uniform seed spacing to start with a good plant population to give the crop a solid foundation. Growers have the option of using several effective fungicidal seed treatments to control Rhizoctonia seedling damping-off should it become warm and wet soon after planting. Growers with a history of Aphanomyces in their fields are advised to use Tachigaren seed treatment and to apply and incorporate precipitated calcium carbonate to their fields to manage Aphanomyces damping-off and root rot. In areas with a history of high populations of sugarbeet root maggot, growers need to combine insecticidal seed treatments with recommended insecticide applications at planting time and prior to peak fly-emergence.

Growers in eastern North Dakota and Minnesota have finally started planting that was delayed by wet field conditions. I encourage all producers to practice safety in all of your operations. Wishing you a bountiful and sweet sugarbeet crop.

**STAYING SAFE AND PRODUCTIVE FOR THE GROWING SEASON**

We are starting the Crop and Pest Report earlier this year. As we are all aware, we have a pandemic of a respiratory disease that spreads from person to person by a new coronavirus called ‘Coronavirus Disease of 2019’, shortened to ‘COVID-19’. This disease can cause mild to severe illness and even death and it is most severe in older adults and those of us with a compromised immune system. COVID-19 started last December in China and is currently reported in about 185 countries and regions including the US where it is present in all 50 States as well as the District of Columbia, Guam, Puerto Rico, Northern Mariana Islands and the US Virgin Islands.

As of April 27, 2020, over 3 million people worldwide were infected with COVID-19 with over 214,000 mortalities. In the US, we have over 1 million known infections and over 58,000 of our people have died from this virus.
extend my sympathies to those of you who have lost loved ones and friends because of the pandemic. It is a very difficult, stressful and emotional situation.

What can we do to help mitigate COVID-19?

COVID-19 is also present in North Dakota and Minnesota and each one of us has to take personal responsibility to ensure that we do not contract nor spread the disease. We can do our part by following the Center for Disease Control Guidelines. These include regular and proper washing of our hands with soap and hot water; wearing a mask; keeping our distances; sneezing into our arm; avoid touching our eyes, nose and mouth since these are entry points for the pathogen; stay home if feeling unwell; seek medical attention if you have a fever, a cough and difficulty breathing. Please consult your local health authority for the best medical advice.

Importance of our Producers

North Dakota and Minnesota together produce a significant amount of agricultural products for our fellow citizens and the world market. We are top producers of wheat, barley, soybean, milk and dairy products, pork, oil crops such as canola and flaxseed, sunflower, corn, sugar, honey, edible beans, fruits and vegetables, lamb, turkey, chicken, beef and potatoes. It is critical that our producers stay safe during this pandemic since they play a critical role in feeding our nation. I implore you to take care of yourself, your family, and your community, and together, we will survive and become a more resilient people.

Mohamed Khan
Extension Sugarbeet Specialist
NDSU & U of MN
701-231-8596
the most susceptibility varieties carry the most amount of bacteria. This further stresses the importance of selecting a variety with a BLS score of 5 or less (Extension Publication A574-19)

A common pathogen that survives within a kernel is the loose smut pathogen. Loose smut may be our most common seed-borne disease of wheat and the signs of this pathogen are most evident when the wheat head emerges (black dusty spores replace kernels – Figure 1). Aside from using clean seed, fungicide seed treatment (FRAC 3, 7 or 11) can significantly reduce loose smut incidence.

Scabby wheat seed is another common seed-borne disease. The Fusarium fungus that causes shriveled and lifeless kernels can lead to lower germination rates and seedling blight. It is important to note that scabby seed will not lead to Fusarium head blight. If you choose to use a scabby seed source, it is best to remove (clean) as many scabby kernels as, check germination rate, and adjust plant populations accordingly. A fungicide seed treatment should also be considered if the level of scabby kernels is high after cleaning.

The most common pathogen that can be found in seed lots is Claviceps purpurea (ergot). In the last couple years, it appears ergot prevalence has increased for certain regions of the state. There are several factors that can influence ergot risk including cool-wet weather at heading, vicinity to other grassy weed hosts, and factors that may disrupt successful pollination such as nutrient stresses, herbicide damage, and hail. However, when ergot is found in the seed lot, here are a few thoughts to consider on how it may impact the 2020 crop. The mushroom spore-bearing structures that germinate from ergot bodies tend to reach maximum lengths of ¾ inch (Figure 2). Thus, it is possible that the seeding depth of wheat will likely drive the ergot bodies far enough into the soil preventing the spore-bearing structures from reaching the soil surface. Also, unlike other sclerotia-producing
diseases such as white mold, ergot bodies are prone to rapid degradation by fungi and insects and do not last more than one year.

**Residue-borne**

Fungal leaf spots and Fusarium head blight are diseases that benefit most from host residue. Fungal structures for these pathogens can survive for several years, but the availability of spores is most important the year after a crop was sown in the field.

Tan spot, Stagonospora nodorum blotch and Septoria tritici blotch all survive very well on wheat residue. The pathogens responsible for these diseases can also be seed-borne, but residue tends to be the most important inoculum source. The most common fungal leaf spot that is observed in ND is tan spot, and all three can potentially occur in the same field. There are no HRSW varieties that are immune to fungal leaf spots and variety scores can be found in A574-19. Another management tool that is commonly used in ND is the use of a fungicide tank-mixed with an herbicide at the tillering growth stage. There are several effective fungicides available for use on fungal leaf spots in ND and the “response” of a fungicide will depend on several factors (more on this next week!).

The Fusarium head blight pathogen survives on small grain residue, and its most preferred host is corn (Figure 3). *Fusarium graminearum* can cause stalk rots, seedling blights, and ear mold on corn and uses the crop as a saprophytic host as well. Corn residue has more surface area than small grain residue and takes longer to break down, and the combination of these factors make corn a very important inoculum source. It is likely that some wheat will be planted on corn ground this year, and if that is the case, make sure to understand that you will have a higher in-field inoculum source for FHB. This does not necessarily guarantee a FHB problem as environmental conditions are an important factor for this disease. Prolonged periods of relatively humidity prior to heading and throughout the flowering process will drive FHB epidemics. Remember that host resistance is our most important management tool against FHB, and when combined with a well-timed fungicide at onset of early-flower (or up to seven days later), can reduce disease and DON levels up to 70%.

*Andrew Friskop*

Extension Plant Pathology, Cereal Crops
IDENTIFICATION OF SEEDLING KOCHIA AND HORSEWEED (MARESTAIL)

The landscape is greening up and planting activities have begun across North Dakota. I have received a few questions for some tips and tricks to help differentiate seedling kochia from seedling horseweed (marestail). While most of us are familiar with kochia, horseweed is a relatively new weed for us and at times can be confused with small kochia seedlings. Here are a few brief descriptions and pictures of each weed to help identify them at early growth stages this spring.

Kochia often germinates in very dense mats consisting of numerous individual plants. These mats often appear to be dull green due to kochia’s leaf color. Young kochia seedlings are very densely hairy and will often be described as “puffballs” due to the dense hairs. Kochia cotyledons are linear. Leaves are linear to lanceolate and taper to a point.

Most of our horseweed will germinate in the fall, then overwinter as a rosette, and begin to bolt in the spring. With abundant rainfall across the state last fall, there should be plenty of overwintered horseweed plants ready to bolt or already bolting as we enter May. There is a smaller percentage of plants that do not germinate until the spring, and these plants bolt almost immediately after emergence and can be more readily confused with kochia seedlings. Unlike kochia, horseweed seedlings will rarely be found growing in dense mats. Horseweed cotyledons are oval shaped and
easily distinguished from kochia cotyledons. Young leaves are oval shaped and become more linear as the plant matures. Most horseweed leaf margins are toothed or lobed.

SUGARBEET HERBICIDES, 2020

The sugarbeet herbicides we use in 2020 will be the same herbicides we used in 2019 as there are no new products or label changes, at least changes I am aware of. Two important points in preparation for weed management, 2020. First, retailers will not be selling Betamix, but growers can continue to use Betamix they received from the cooperatives and secured in on-farm storage if they follow the label. Second, growers should discuss presence of hard-to-control or resistant weeds in their community with their neighbors, their county agent, their ag-retailer or their consultant. Weed resistance happens locally and herbicide effectiveness in a different county or state does not matter. What matters is herbicide performance on your farm or in your township.

S-METOLACHLOR PRODUCTS APPROVED IN SUGARBEET

Sugarbeet planting is underway in North Dakota and Minnesota. S-metolachlor products are used in sugarbeet for control of *Amaranth* species including waterhemp. Dual Magnum is registered preplant or preemergence in sugarbeet by a section 24(c) special local needs label in sugarbeet in Minnesota and North Dakota. Use Dual Magnum at rates from 0.5 to 1 pt/A depending on organic matter and soil texture. Research conducted at NDSU / UMN indicates % OM in fields determines the use rate. Use Dual Magnum at 0.75 to 1 pt/A only when % OM in fields is greater than 3.5.

S-metolachlor products are labeled postemergence, once sugarbeet reach the two-leaf stage in sugarbeet for residual control of broadleaf weeds including common waterhemp. The ‘S’ in S-metolachlor is not a reference to a safener but is reference to the resolved isomer or active isomer of metolachlor (S-metolachlor). A list of S-metolachlor products approved in sugarbeet follow. Some S-metolachlor plus benoxacor safen products are approved in sugarbeet although benoxacor does not provide benefit in sugarbeet. Use S-metolachlor at rates ranging from 1 to 1.25 pt in a
single or layered application once sugarbeet reach the 2-If stage. The second application should follow 17 days after the first application in a layered application or no later than the 8-If stage. Please read and follow all label directions before use.

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<tr>
<th>Herbicide</th>
<th>Labeled preemerge</th>
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<th>Formulation</th>
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</tbody>
</table>

**ETHOFUMESATE APPLIED PREPLANT OR PREEMERGENCE IN SUGARBEET**

Ethofumesate is registered for preplant, preemergence, and postemergence control of grasses and broadleaf weeds in sugarbeet. Ethofumesate was first registered by Fisons Corporation as ‘Nortron’ in 1977 at rates soil applied to 7.5 pt/A. Ethofumesate has evolved into one of our most important and versatile herbicides and is currently sold using the brand names ‘Nortron’, ‘Ethotron’ and ‘Ethofumesate 4SC’.

Ethofumesate applied at rates to 3 pt/A provides up to 4 weeks of waterhemp control and provides season long waterhemp control when applied in a program approach with chloroacetamide herbicides (S-metolachlor, Outlook and Warrant). Ethofumesate is relatively water insoluble and needs approximately 0.75" rainfall to activate when applied preemergence. Ethofumesate at 2 to 3 pt/A may reduce nurse crop stands especially when rainfall occurs immediately following seeding. We are confident small grains can follow ethofumesate at rates to 3 pt/A in sugarbeet.

Apply ethofumesate at rates from 4 to 7.5 pt/A depending on soil texture and soil organic matter. Ethofumesate at 5 to 7.5 pt/A controls kochia and provides 8 to 10 weeks waterhemp control. However, ethofumesate at rates greater than 2 pt/A will significantly injure / kill nurse crops. We recommend broadleaf crops only follow ethofumesate at rates greater than 5 pt/A.

Ethofumesate rate and activation method depends on your weed control challenges. Soil applied options across rates are effective for waterhemp control but only high ethofumesate rates control kochia. Likewise, for kochia control we recommend preplant application and light incorporation (depth of 2" or less) since kochia emergence will be immediate and may escape PRE ethofumesate application. Ethofumesate targeting waterhemp can be applied preplant or preemergence since waterhemp germinates and emerges after May 15 in our region. Apply ethofumesate preemergence in 15 gallons of water using medium to course droplets. Always follow label directions.

Tom Peters
Extension Sugarbeet Agronomist
NDSU & U of MN
CANKERWORMS – TIME TO BEGIN SCOUTING

Populations of cankerworms, spring defoliators of deciduous trees, have increased over the past two years causing damage throughout much of the state. We’re expecting another bad year in 2020. The insects feed on a number of tree species, including boxelder, elm, ash and linden.

The spring cankerworm (*Paleacrita vernata*) and the fall cankerworm (*Alsophila pometaria*) are the insect pests causing the problem. Although they differ in their life cycles, both species’ larvae (caterpillars) emerge at about the same time; therefore, they’re managed together.

Larvae are susceptible to insecticides when they’re young/small, though we usually don’t notice the defoliation in the tree canopy until it’s too late. Therefore, scouting for these pests is critical in order to properly time our treatments. Fortunately, a mathematical model describing the insects’ growth has been developed. Utilizing a base-50 Growing Degree Day (GDD) model, the insects are susceptible to insecticides between 148 and 280 GDD. The ND Agricultural Weather Network (NDAWN – https://ndawn.ndsu.nodak.edu/) uses a base-50 GDD model for corn, which we can utilize for cankerworm management. Notice how variable the number of GDDs for cankerworms are across the state. Scouting should begin in the southwestern part of the state, while in the northeast, it will be several days until the insects begin to emerge.
A number of chemical insecticides are effective in controlling cankerworms when the larvae are young (see below). In the past, sticky bands were often put on the outside of tree trunks with the hope of controlling the female adult moths, since they cannot fly and crawl up the trunks to lay eggs. Unfortunately, sticky bands aren’t effective at controlling cankerworms, but they can serve as a detection aide. The bacterial-based pesticide *Bacillus thuringiensis var. kurstaki* (Btk) is effective at controlling cankerworms, especially when larvae are small about ½-inch long, about 10 days after egg hatch. This biopesticide is highly recommended since it is safer to wildlife (e.g. birds that may eat the larvae) and beneficial insects that provide ‘natural’ control.

### Insecticide products for controlling cankerworms.

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<thead>
<tr>
<th>Active Ingredient</th>
<th>Example Trade Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acephate</td>
<td>Orthene, Isotox</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Bifenthrin Pro, Talstar</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>(Sevin – old formulation)</td>
</tr>
<tr>
<td>Cyfluthrin</td>
<td>Tempo</td>
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<tr>
<td>Deltamethrin</td>
<td>DeltaGard</td>
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<tr>
<td>Lambda-cyhalothrin</td>
<td>Scimitar</td>
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<tr>
<td>Malathion</td>
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</tr>
<tr>
<td>Permethrin</td>
<td>Astro</td>
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<tr>
<td>Zeta-cypermethrin</td>
<td>(Sevin – new formulation)</td>
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</tbody>
</table>
Biorational pesticide products for cankerworm control.

<table>
<thead>
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<th>Active Ingredient</th>
<th>Commercial Trade Name</th>
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<tbody>
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<td>Azadirachtin</td>
<td>Azatin XL, Bioneem</td>
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<tr>
<td><em>Bacillus thuringiensis var. kurstaki</em></td>
<td>DiPel, Javelin, Lepinox</td>
</tr>
<tr>
<td>Diflubenzuron</td>
<td>Dimilin (insect growth regulator)</td>
</tr>
<tr>
<td>Insecticidal soap</td>
<td>Safer Insecticidal Soap</td>
</tr>
<tr>
<td>Pyrethrins</td>
<td>PyGanic</td>
</tr>
<tr>
<td>Spinosad</td>
<td>Conserve, Entrust, SpinTor</td>
</tr>
<tr>
<td>Tebufenozide</td>
<td>Mimic (insect growth regulator)</td>
</tr>
</tbody>
</table>

For more detailed information about cankerworms, see the new NDSU Extension publication *Cankerworms in North Dakota (E999)*.

Disclaimer: Mention of any product does not imply an endorsement of one product versus another nor discrimination against any product not mentioned by NDSU Extension or the authors.

Joe Zeleznik                                  Janet J. Knodel
NDSU Extension Forestry Specialist          Extension Entomologist

AROUND THE STATE

NORTH CENTRAL ND

Some hit and miss showers are part of the forecast for areas of the North Central region in North Dakota. While some moisture may be welcomed, growers are ready to be out in the field. Some planting of research plots started in the last week at the NCREC. Select growers have started small grain planting in the region as well. Here are some quick precipitation reports from the last two weeks: Minot: 0.01”; Bottineau: 0.00”; Garrison: 0.00”; Karlsruhe: 0.00”; Mohall: 0.00”; Plaza: 0.04”; and Rugby: 0.01”. Last week, some Canola Flea Beetle traps were placed at the NCREC. Populations have been observed, though still low at this time.

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

I think it is fair to say that 2020 has started off like nothing we’ve ever seen before. With COVID-19 causing disruptions to almost all aspects of daily life, it is reassuring to see spring arriving in Northwest ND. For those of us involved in agriculture, the warmer temperatures and planting season are a familiar comfort and allow us to get outside and start the work of the growing season.

Planting started in earnest last week in much of Northwest ND with just a few early birds able to start planting the previous week of April 13th. Many fields are still soft after the record-breaking September rains and a little more drying out is needed before everything is ready to plant. Interestingly, we’ve had very little new moisture in March and April. Most places received just a dusting of snow once or twice and a few trace amounts of rain in scattered showers last week. The top 2” of soil is drying out, but there is still a lot of subsoil moisture lower in the profile.

Soil tests taken down to 24” here at the Williston REC have been uniformly low in N showing that leaching happened last fall with all the rain. If you still need to apply fertilizer, I highly recommended testing your soil to see how much N is available and adjusting your application plans accordingly. If you are a long-term no-till practitioner, select a few fields to test the top 2” separately from the deeper cores you normally take to check pH at the soil surface. We’ve seen a decrease in pH (more acidic conditions) in some long-term no-till fields in southwestern ND and at the WREC and we want farmers to be on the lookout for low pH/acidic soil conditions. If you have fields with pH < 6.0, it is time to start thinking about how to maintain or increase pH and consider avoiding rotations heavy in crops with high N needs. Fields with pH < 5.0 are at risk for exhibiting aluminum toxicity and need remediation.

If you’re interested in a weekly update on ag markets from NDSU economists Frayne Olson, Tim Petry, and Bryon Parman, register for the Friday Ag Market Outlook webinars here: https://ndsu.zoom.us/webinar/register/WN_N5HTqzRDT3KAkmpRhEmIkA

These webinars will be every Friday in May at 12:30 pm Central Time.

Best wishes to everyone for a safe and healthy planting season!

Clair Keene
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center

NORTHEAST ND

Spring field operations are starting across the northeast. We have mixture of soil conditions from those who could use a little moisture recharge and those who dealt with spring flooding issues. Bare soil temps at 4-in. depth are in the mid-40s to 50°F. Many farmers are dealing with issues of crop residue left in the field and also very little fertilizer was applied last fall. Spring wheat planting has just began in coarse-textured fields. Some farms are short on hired labor due to travel restrictions.

Lesley Lubenow
Extension Cropping Systems Specialist
NDSU Langdon Research Extension Center
SOUTH-CENTRAL/SOUTHEAST ND

The geographic area generally covered by this report includes a northern border of Sheridan County to Eddy County southward to Sargent County and west to Emmons County.

According to NDAWN, the region’s bare soil temperature at 4-inch depth during the period of April 25-27 averaged 45-55 degrees. At Carrington on April 28, 32 degree soil temperature was present at the 20-inch depth.

Alfalfa regrowth is at 2- to 3-inch height. Winter cereals are in the seedling to early tillering stages. Perennial weeds including quackgrass, dandelion, absinth wormwood, Canada thistle and field bindweed; and winter annual weeds are regrowing. Spring annuals including kochia and wild buckwheat also have emerged.

The Carrington REC’s first research trials (barley and spring wheat variety performance) were planted on April 24. While 2020 small grain and corn planting has recently begun, 2019 corn and soybean harvest continues in scattered fields in the region.

Winter rye seedlings (April 28)

Dandelion and cotyledon-stage wild buckwheat

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

Even though it feels early after a couple of years with delayed planting, many are on track with planting progress. Many acres of wheat, canola, and pulses have been planted across the region. Some are further along and some have more moisture. Issues with standing crops from 2019 are being managed in many ways over the past month including different forms of tillage, burning, and some harvesting. Over the past month there have been a couple light rain and even snow events but we haven’t received much for moisture. According to NDAWN from April 1st to April 27th Dickinson received 0.2 inch of rain, Beach received 0.54 inch, Bowman with 0.34, and Hettinger with 0.17. The soil temperature has been warming up with April 27th average for bare soil in Dickinson at 55 degrees.

If you are looking for something to listen to while out doing fieldwork be sure to look up Agronomy and Economy wherever you find your podcasts or listen on Spotify at this link https://open.spotify.com/show/7xaBs5lu0YPkSF1Mf0yHT3. Be sure to stay patient on the roads and give those hauling farm equipment and fertilizer the space they need.

Ryan Buetow
Extension Cropping Systems Specialist
NDSU Dickinson Research Extension Center
THE WEATHER SUMMARY AND OUTLOOK

To start off the 2020 Crop and Pest report season, I thought I would give my outlook for the upcoming growing season. Because of scheduling conflicts, illness and eventually the cancellation of several public appearances due to the current COVID-19 situation, many of you probably did not get a chance to hear my weather projections for the summer of 2020. My projections for April/May was for cooler than average and wetter than average conditions with the bulk of the wet and cool coming in April and the first half of May, which seems to be working out well. This month the average temperature at most NDAWN stations have been between five and ten degrees below average with most locations experiencing above average precipitation.

I am anticipating May to finished near or a bit below average for temperatures, but the month does not look anywhere near as cold as April (per average). Precipitation in May is expected to be near average or below for most of the area, but there are almost always exceptions when it comes to long range precipitation projections as one thunderstorm can be the difference between being below or above average for precipitation.

Moving on to summer, there are a number of reasons to believe that June through August this year will be noticeably different than what we experienced in 2019 with perhaps the exception of northeastern North Dakota which may end up with a similar summer to 2019. The Pacific Ocean has cooled since last year and the equatorial Pacific Ocean is expected to go from a weak El Niño (at least 0.5° C warmer than average in the equatorial Pacific) to slightly cooler than average. Perhaps not technically a La Niña (at least 0.5° C cooler than average in the equatorial Pacific), but a transition to the cool side of average. In the past when similar changes occurred, those summers were drier than average across much of the Northern Plains. This should lead to a more consistent upper-level wind flow out of the northwest this summer, which leads to less Gulf of Mexico moisture moving north to feed into our thunderstorms. Plus, the Atlantic Ocean temperature patterns have adjusted to a pattern that historically has brought a tendency to drier than average conditions to our region as well.
Although, not a forecast, but only a statistical observation, 2019 was a very wet year in most of North Dakota, with last autumn being a “white bison” incident. A “white bison” incident is the phrase I use to describe an event or period not only well outside the norm, but also far removed from any other recorded condition. The heat wave in the summer of 1936, the cold wave in the winter of 1936, or the heavy rain in March 2009 would be other events I would describe as “white bison” weather incidents. I mention this because if you look through the weather records, almost all extremely wet years were followed by a year with average or below average rainfall. That may only be a statistical observation, but an interesting pattern seen many times in the past 140 years of recorded weather conditions.

In Figure 2 and Figure 3 you will find images that represent conditions in the lower 48 states when we had similar atmospheric and oceanic conditions to what we have experienced in the past few months and what these conditions are projected to be this summer. The plains under these scenarios tend to lean dry with rainfall near or below average and temperatures lean a bit warmer being near or slightly above average. Of course, no one should change their plans based on these projections, but are given as potential guidance.

![Figure 2. Analogs of past summers precipitation anomalies (in inches) with similar conditions to 2020](image_url)
In the short term, warmer weather today (Thursday) and Friday. Some hit and miss showers or thunderstorms are expected on Friday, especially across northern North Dakota into far northwestern Minnesota. Another threat of rain will impact most of the area on Monday and lingering into Tuesday. Neither system looks to be bringing widespread heavier rain, but localized 0.50” totals will be possible. The rain early next week will drag in some cooler air from central Canada that looks to be lingering through much of next week. Meaning, probably more days below average than above average for temperatures next week.

I will start with my weekly summaries and more detailed projections in next week’s Crop and Pest Report. If there is something in particular you would like me to forecast or talk about please send me an email request.

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