NEW MULTI-STATE ENTOMOLOGY PUBLICATIONS

MANAGEMENT OF INSECTICIDE-RESISTANT SOYBEAN APHIDS E1878

Soybean producers have a new tool to help them manage insecticide-resistant soybean aphids. This new extension publication summarizes the development of insecticide resistance in soybean aphids in the upper Midwest and how to manage insecticide resistance using an Integrated Pest Management approach. The series was a collaborative effort among Extension Entomologists from the University of Minnesota, Iowa State University, NDSU and South Dakota State University.

In 2017, failures of certain pyrethroid insecticides for management of some soybean aphid populations were observed in commercial fields (see red areas on map on page 2), and resistance to bifenthrin and lambda-cyhalothrin has been documented through small-plot research and laboratory bioassays.
Key IPM strategies to slow the development of insecticide-resistant soybean aphid include:

- Use the economic threshold (E.T.) of 250 aphids per plant with >80% of plants infested to decide when to treat fields (Or, use speed scouting).
- Apply insecticide using the full labeled rate with proper spray technology (good coverage) and under favorable environmental conditions (winds <10 mph).
- If more than one application is necessary for soybean aphids or other insect pests, rotate to a different mode of action (MOA).

In E1878, two foliar-applied insecticide tables are included that list the different MOAs for insecticides with a single active ingredient and for premix insecticides with two active ingredients.

The “Management of insecticide-resistant soybean aphids E1878” is available online at https://www.ag.ndsu.edu/publications/crops/management-of-insecticide-resistant-soybean-aphids/e1878.pdf

This work is supported by the North Central Soybean Research Program and each state’s soybean society including the Minnesota Soybean Research & Promotion Council, Iowa Soybean Association, North Dakota Soybean Council and South Dakota Soybean Research & Promotion Council.

**PULSE CROP INSECT DIAGNOSTIC SERIES**

**FIELD PEAS, LENTILS AND CHICKPEAS E1877**

Pulse crop producers have a new tool to help them identify insect pests that attack chickpeas, field peas and lentils in the major pulse-growing areas of the U.S. The new “Pulse Crop Insect Diagnostic Series” from the North Dakota State University Extension summarizes insect pests of the northern Plains (Montana, North Dakota and South Dakota) and the Palouse area of the Pacific Northwest (Washington, Idaho and Oregon). E1877 was a collaborative effort among NDSU, University of Idaho, South Dakota State University and Montana State University.

The series features integrated pest management (IPM) tools for managing major insect pests of pulse crops. Sections of the series include pest identification, crop damage, monitoring or scouting tips, economic threshold, cultural control, host plant resistance, biological control and chemical control. The insect pests covered in the series are wireworms, cutworms, pea leaf weevils, grasshoppers, Lygus bugs, pea weevils and pea aphids.

Some of the beneficial organisms that attack these insect pests of pulse crops also are addressed. For example, Lady beetles (adults) and larvae that consume about 50 to 300 aphids per...
day are an example of beneficial organisms. Other effective predators covered are lacewings or aphid lions, minute private bugs, and Syrphid flies or hoverflies. The series also includes information about tiny parasitic wasps called parasitoids that lay eggs inside the body of aphids, and as larvae hatch from the eggs, they eat the aphid from the inside out, killing it.


This work is supported by the U.S. Department of Agriculture’s National Institute of Food and Agriculture, Crop Protection and Pest Management Program through the North Central IPM Center (2014-70006-22486).

Janet J. Knodel
Extension Entomologist

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**NDAWN POTATO BLIGHT APP**

We are excited to announce that we will posting the potato Blightline on a new app, called NDAWN Potato Blight. The NDAWN Potato Blight app is available on Apple and Android phones and tablets ([z.umn.edu/potatoapp](http://z.umn.edu/potatoapp)). The app is designed to provide field-specific information of when environmental conditions are favorable for early blight and late blight by entering in key field information. Blightline messages and alerts will be sent through this app to potato growers in North Dakota and Minnesota.

In previous years, the late blight and early blight models that were used for all potato acres in North Dakota were based on one average emergence and row closure date for the state of North Dakota and therefore not accounting for individual field information. Potatoes can be planted during a two-month period from late April to late June in North Dakota and Minnesota; therefore, making this model inaccurate for some potato acres. The field-specific model now available on the NDAWN Potato Blight app will more accurately predict the best time to apply protectant fungicides to each potato field. Included in the app is a real-time weather data from any NDAWN station. A video tutorial on how to use the app can be found at [z.umn.edu/appvideo](http://z.umn.edu/appvideo).

Andy Robinson
NDSU/U of M Extension Potato Agronomist

Gary Secor
NDSU, Plant Pathologist
2017 NATIONAL SUNFLOWER ASSOCIATION SURVEY RESULT

The National Sunflower Association has conducted in-depth fall surveys in farmer’s fields throughout the main sunflower growing regions of the United States as well as in the Canadian province of Manitoba for the last sixteen years.

During the 2017 sunflower growing season, trained teams, including agronomists, entomologists, pathologists, and Extension agents, surveyed 78 North Dakota sunflower production fields. Each team evaluated plant stand, yield potential, disease, insect, and weed issues for each field. A yield estimate was calculated based on plant stand, head size, filling of the head, seed size, percent filled seeds, and percent loss due to bird feeding. The 2017 average surveyed sunflower yield was 1,766 pounds per acre in North Dakota (Table 1). A determination of yield limiting factors was based on the surveyors’ judgement after observing all production aspects in the field. Table 2 shows the most yield limiting factors in 2017.

Overall, the most yield limiting factors in 2017 were drought, followed by plant spacing within the row, and disease (Table 2). As expected due to environmental conditions, disease was not as significant of an issue in drought impacted regions, although it was still an issue across the surveyed area.

The plant spacing difficulties included large skips within the row, or areas where plants grew too close together, causing some of the plants not to contribute to sunflower yield. Even and regular distribution of plants within the field is essential to obtaining maximum sunflower seed yield. Irregular plant distribution could have been a result of poor seeding conditions, failure to adjust the planter, driving too fast, poor germination, disease, insect damage, or other factors. Farmers should pay attention to the plant spacing issue and planter calibration and adjusting the planting speed may be the first step to reducing skips and achieving more uniform plant spacing. Farmers should also pay attention to the seeding rate as on average in North Dakota the number of plants per acre was below plant densities needed to reach optimum yield.

Table 1. 2017 fields surveyed per state, oil and confectionary sunflower fields in percent, yield estimate, and plant population per acre.

<table>
<thead>
<tr>
<th>State</th>
<th>Number of fields</th>
<th>Oil flowers % of fields</th>
<th>Confectionary % of fields</th>
<th>Yield (lb/a)</th>
<th>Plants per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota (ND)</td>
<td>78</td>
<td>88.5</td>
<td>11.5</td>
<td>1,766</td>
<td>16,893</td>
</tr>
<tr>
<td>Minnesota (MN)</td>
<td>8</td>
<td>50</td>
<td>50</td>
<td>2,231</td>
<td>17,344</td>
</tr>
<tr>
<td>South Dakota (SD)</td>
<td>55</td>
<td>81.8</td>
<td>18.2</td>
<td>1,820</td>
<td>15,581</td>
</tr>
<tr>
<td>Manitoba (MB)</td>
<td>6</td>
<td>50</td>
<td>50</td>
<td>1,681</td>
<td>16,381</td>
</tr>
</tbody>
</table>
Table 2. Most limiting factor in fields for North Dakota, Minnesota, South Dakota and Manitoba, 2017.

<table>
<thead>
<tr>
<th>% Most limiting factor in fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>ND</td>
</tr>
<tr>
<td>No problem</td>
</tr>
<tr>
<td>Birds</td>
</tr>
<tr>
<td>Disease</td>
</tr>
<tr>
<td>Drought</td>
</tr>
<tr>
<td>Uneven plant growth</td>
</tr>
<tr>
<td>Hail</td>
</tr>
<tr>
<td>Insects</td>
</tr>
<tr>
<td>Lodging</td>
</tr>
<tr>
<td>Plant spacing within row</td>
</tr>
<tr>
<td>Weeds</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>Total observations</strong></td>
</tr>
</tbody>
</table>

Bird damage was observed in 60% of fields in ND and 40% of fields surveyed in SD (Figure 1). Severity of bird damage was 8.1% in ND and 5.5% in SD. Overall bird damage was not a major yield limiting factor for fields surveyed, however the survey does not take into account any additional bird damage that may have occurred after the survey was conducted.

Information generated from the National Sunflower Survey can be used by farmers to improve management decisions as well as help scientists direct research needs.

![Figure 1. Bird damage incidence and severity in sunflower fields surveyed in 2017.](image-url)
Last week in my Crop and Pest Report, I discussed the effect of late planting on spring wheat yield. Substantial progress in wheat planting was achieved this past week (from 3% to 20%), nevertheless the area planted is still significantly less than last year and the five year average. Hopefully the weather will allow for continued progress in planting this coming week.

According to the most recent NASS data (week ending May 6th), only 7% of the corn area had been planted in North Dakota. This compares to 20% last year and 24% for the five-year average. The recommended planting date for corn for all regions of the state is May 1st (or more realistically the first two weeks in May). Because corn is a warm season crop, it will not grow when temperatures are below 50 degrees, so when soil temperatures remain below 50 degrees after planting there is little growth regardless of the calendar date. When planting is delayed beyond the middle of May, the risk of the crop being killed by frost in the fall before it reaches physiological maturity increases, as does the chance that the grain will be wet, difficult to handle, and expensive to dry. Dr. Franzen’s article this week provides information on the type of losses that can occur as corn planting is delayed. These data are based on small plot research over multiple seasons and therefore estimate average losses; losses in a given seasons may be less or more than those listed.

Similar to what I did last week for wheat, I examined the relationship between planting date and final yield for the past 10 year on a statewide basis using planting progress and final yield data from NASS. The relationship between the date when 50% of the corn area in the state had been planted and yield that year are summarized in the graph on page 7. For the purposes of this article, to fix a 50% planted date, I extrapolated between the NASS reporting dates when there was less than 50% planted and when there was more than 50% planted. The yield values were those reported for the state as a whole.
Unlike what was found for wheat where there was little relationship between planting date and yield, in corn this relationship was more pronounced. The equation from this relationship suggests that for every day delay in planting beyond May 3rd, yield is reduced by about 1.1 bu per day. This yield loss is roughly in line with the results from the smaller plot research reported in Dr. Franzen’s article. 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.

These data show the importance of planting corn early. However, planting date is not the only determinant of yield and in fact only explains about 30% of the yield in the above graph. This means that regardless of planting date, weather and management play a critical role on yield. Establishing a uniform stand is a critical practice in developing a foundation for high yield. Therefore, even though we are nearing the end of the optimum planting period for corn, don’t be in such a rush that plant stand uniformity is compromised. In addition to temperature, soil moisture, planting speed, and crop residues have been shown to impact corn emergence. Interestingly in some survey work that we did a few years ago, the speed of the planter was found to be one of the most important determinates of variability in emergence. Since crop residues can influence soil temperature (and uniformity of emergence), make sure trash managers are working and properly adjusted. Seeding depth can also play a role in emergence variability. Provided there is moisture, seeding at 1.5 to 2 inches seems to work best for establishing a uniform stand in most environments.

Joel Ransom
Extension Agronomist for Cereal Crops

WEEDS GERMINATE AND EMERGE TEMPORALLY DURING SPRING AND SUMMER

Annual weeds germinate in the spring, grow during the summer and set seeds in the fall. Sounds basic, doesn’t it? Unfortunately, that is where the simplicity ends. Weed management would be a straightforward task if all weeds germinated and emerged at the same time and weeds probably would not be an annual challenge if we could take this approach. Instead, weeds germinate at various times, allowing them to escape control, produce seed and contribute to seed banks that may persist for multiple years.

Weed emergence can be predicted by tracking air or soil temperature and by calculating accumulated growing degree days (GDDs) using base temperature (Tbase = 48 F) starting on January 1 of each year. Accumulated GDDs suggest weeds germinate in clusters including early-emerging, middle-emerging and late-emerging species. The earliest emergers including Kochia, common lambsquarters, and common and giant ragweeds emerge at <150 GDD. Research
indicates Kochia will emerge with as few as 5 accumulated GDD. Middle-emerging species include foxtail species, Venice mallow and common sunflower and emerge at between 150 and 300 GDD. Late emerging weeds include redroot pigweed and waterhemp and emerge at > 300 GDDs.

Knowing when weeds begin to emerge can direct scouting activities and improve overall weed management strategies. For example, early emergers, especially those with short emergence duration, can be managed after most seedlings have emerged using postemergence herbicides or with tillage prior to planting. In comparison, middle and late emergers may need to be controlled with preemergence or postemergence herbicides. Some weeds like lambsquarters, redroot pigweed or waterhemp have extended emergence patterns and may require multiple control strategies including layer application of soil-residual herbicides. NDSU research indicates cultural practices, such as use nurse crops appear to delay emergence and suppress development of certain middle and late emerging weeds.

The emergence sequence of different weeds is consistent from year to year although the initial emergence date for weeds varies from year to year. Weeds emerge over a prolonged time period, so weeds from earlier clusters may still be emerging when a later cluster begin to emerge. Modeling temperature is a reasonable way to predict weed emergence. However, emergence is influenced by several other factors than air temperature, including cloud cover, soil type and moisture, and crop residue.
PLANT POPULATIONS FOR HIGHEST SUGARBEET YIELD AND QUALITY

What is the recommended plant population to get the highest yield in sugarbeet?

Researchers at North Dakota State University and the University of Minnesota have demonstrated that a wide range of plant population (100 to 300 plants per 100 ft of row) with uniformly spaced plants resulted in high tonnage and recoverable sucrose. Plant populations of 175 to 200 plants per 100 foot of 22-inch wide rows consistently resulted in the highest recoverable sucrose per acre. It is critical that the plants be evenly spaced within the rows. It is recommended that growers plant to have higher populations (4.5 to 4.75 inch seed spacing to get 200 plants after emergence) to cater for any reduction in population from wind, insects, diseases etc.

Do all growers in Minnesota and North Dakota use 22 inch rows?

No. We have a small percent of growers with 30 inch rows to facilitate use of machinery and equipment for several row crops. We have not conducted research on 30 inch rows; however, data from sugar cooperatives indicate that growers with 30 inch rows should strive for at least 225 plants per 100 foot of row for highest tonnage and sucrose concentration.

What should a grower do if he has 75 to 100 plants per 100 foot of row?

If planting was done early, populations of 75 to 100 evenly spaced plants per 100 ft of 22 inch rows will produce higher yields with larger beets than higher plant populations planted three or more weeks later in similar growing conditions. It is highly recommend that the growers visit the field with his/her agriculturist to determine whether replanting is necessary. The grower should consider whether the variety of seed suitable for his field is available, whether conditions are favorable for timely replanting, germination and emergence, as well as crop insurance. Any replanting of sugarbeet because of lower than ideal stands should be carefully considered.

When is the best time to plant sugarbeet?

One of the important factors for high sugarbeet yields is to plant as early as is practical taking into consideration the possibility for a frost in May. Most growers aim to get their sugarbeet planting done from around April 12 through early May based on field conditions. Wet field conditions have delayed planting in most areas in 2018. However, growers in the Red River Valley have made significant progress with about 80% of sugarbeet planting completed and hoping to be done by this weekend (May 12). Growers in southern Minnesota, adversely affected with a late season snow storm, have made slower progress. If field conditions are favorable, growers in the southern region should complete planting by May 19. It should be noted that planting into seedbeds with warm soil and adequate moisture will have rapid and uniform emergence (in as little as 5-7 days).

Is there any practice you will recommend to protect sugarbeet seedlings?

Yes - The use of cover crops such as oats, barley and wheat help to prevent reduction in plant stand from high winds, reduce soil erosion and also help to conserve moisture after the cover-crop is killed-off with herbicide. I encourage growers to use cover crops especially in fields that are known to have a history of ‘blowing’ during high wind events that is common in spring.

Any closing comments for growers?

In areas where beets have emerged, growers should proactively, scout fields for weeds and take necessary weed control measures to avoid competition of the sugarbeet crop with weeds.

Mohamed Khan
Professor and Extension Sugarbeet Specialist
NDSU & U of MN
701-231-8596
WHEAT FUNGICIDE SEED TREATMENT - FIELD AND GREENHOUSE RESEARCH UPDATE

There are a few key factors that will influence the decision to use a fungicide seed treatment in wheat. These include the seed source being used, field conditions, field history of root rots and seedling blights, and production practices. A general agreement among plant pathologists in the United States indicate a fungicide seed treatment in wheat is most effective on seed borne diseases (i.e.: loose smut; Figure 1) and the residual of the fungicide should not be viewed as having season long protection. A more detailed narrative of these topics has been outlined in a joint Extension publication from the University of Minnesota and North Dakota State University. The primary focus of this article is to provide an update on the stand response of a fungicide seed treatment and the effect of a fungicide seed treatment on a scabby seed lot.

Wheat Field Trials – Fungicide Seed Treatments

A few years ago I wrote an article summarizing data from fungicide seed treatment trials conducted at several locations in North Dakota from 2003-2014. I have since updated this data set and have included results from 2015-2017. The updated data set now represents stand count data for 220 replicated fungicide seed treatments from 43 trials (Figure 2).

Figure 1. Loose smut of durum.

Figure 2. Percent stand differences between fungicide seed treatment plots and non-treated plots across 220 replicated fungicide seed treatments.
A mean stand response of 7.2% was observed across the trials and 73% of the fungicide seed treatments resulted in a positive stand response (greater than zero). This data set provides a snapshot on the variability observed with a fungicide seed treatment. One area that this data set does not address is variability observed in different regions of North Dakota. With that in mind, Ryan Buetow (portion of Ph.D. research) is managing field trials in western (Hettinger and Dickinson) and eastern North Dakota (Fargo and Grand Forks) to evaluate the performance of fungicide seed treatments with regards to tillage practice, previous crop and soil conditions.

**Scabby Seed Lot Greenhouse Trials**

The scab epidemic of 2016 resulted in questions of using Fusarium infected seed (scabby seed) as a seed source in 2017. If a scabby seed source is to be used, it is recommended to clean the seed, use a fungicide, check the germination rate, and adjust plant populations accordingly. Several questions were posed on what type of fungicide is most effective. As a way to help address some of these questions, greenhouse trials were conducted by an undergraduate research assistant (Connor Rieniets) that evaluated the effect of fungicides on the germination rate of scabby seed. The durum seed source used for this trial had a germination percentage of 47%, a deoxynivalenol (DON/VOM) level of 9.3 ppm and 15 out of every 100 kernels was infected with *Fusarium*. Four single fungicide seed treatments differing in mode of action were used for the trial (Figure 3). Results indicated that germination improved when fluxapyroxad (SDHI), pyraclostrobin (strobilurin) or triticonazole (triazole) was used on the scabby seed source. Metalaxyl is a fungicide that has good efficacy on *Pythium*, but has little to no activity on *Fusarium*.

![Figure 3. Percent germination (7 and 14 days after planting) of scabby durum that was treated with four fungicides, compared to non-treated scabby seed and certified seed.](image-url)
LOCAL FERTILIZER SUPPLY DELAYS, PLANTING DELAYS, OR CHARGING AHEAD

I have been made aware that some farmers are experiencing problems obtaining fertilizer nitrogen (anhydrous particularly and sometimes urea) necessary to support their normal fertilization procedure. One farmer I talked to could only get one tank per day. The immediate result has been that some farmers are waiting to plant small grains and corn until fertilizer is spread or ammonia refill of tanks is possible.

I have been worried that this might happen since early April. A normal North Dakota planting season is a month-long period of fertilizer application, with a couple weeks of the application prior to most planting. This season, not only was little pre-planting season fertilizing possible, but small grains and other early-season crop planting (sugar beet, small grains, canola), as well as later-season crop planting (corn, soybean) is all happening at the same time. This puts a logistical compression of a month of fertilizer demand into a week or two. I understand that new trucking laws and enforcement techniques mean that fewer truck loads can be hauled each day by truck drivers. I have also observed more ammonia tanks in the field across the state than I have seen recently, probably because drier soil conditions enable application, and the need to reduce production costs.

The following is what I suggest:
- Where a farmer is not locked into anhydrous as a pre-plant or at-planting fertilizer N choice in small grain or another solid-seeded crop, charge ahead with planting, and apply urea mixed with Agrotain®, Limus®, or another NBPT product of similar per ton rate of active ingredient on top after planting. The cost per acre for product will increase, but the anhydrous supply delay may last for some time, and the per day loss in wheat yield may more than offset any increase in cost and the small N use efficiency loss of surface application. Communicate with the anhydrous dealer to see how serious the delays are and if the delays will ease sooner or later.
- Where the farmer is locked into anhydrous due to a prepayment for a specific product, or the intended crop is a row crop like corn, delay the anhydrous application to a side-dress, apply the anhydrous between the rows and charge ahead with planting.
- If the delay is with urea and the urea is applied with planting in small grains, but phosphate and other fertilizers in the blend are available, plant the small grains/canola using the P and other ingredients, then apply the urea with a urease inhibitor as indicated above.
- If MAP or another phosphate source is delayed, delay planting in small grains and corn if it was intended for a seed-placed, near seed-placed starter application. If intended for a broadcast application, plant and apply fertilizer over the top after planting.

The chart below will help growers decide whether to wait or not. Remember that a delay of a day or two might extend into over a week if a significant rain-bringing weather front moves through the region.

<table>
<thead>
<tr>
<th>Location</th>
<th>Optimum Planting Date</th>
<th>Last Planting Date</th>
<th>Yield Loss Per Day (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South of Hwy 13/21 to SD border</td>
<td>2nd week of April</td>
<td>2nd week of April</td>
<td>Wheat 1.5</td>
</tr>
<tr>
<td>South of I-94 to Hwy 13/21</td>
<td>3rd week of April</td>
<td>3rd week of May</td>
<td>Barley 1.7</td>
</tr>
<tr>
<td>South of Hwy 2 to I-94</td>
<td>4th week of April</td>
<td>4th week of May</td>
<td>Oats 1.2</td>
</tr>
<tr>
<td>South of Canadian border to Hwy 2</td>
<td>1st week of May</td>
<td>1st week of June</td>
<td></td>
</tr>
</tbody>
</table>

Effect of Planting Dates on Corn Grain Yield

Yield Planting Date Potential (%)

From J. Ransom, 2013, A1173, Corn Growth and Management Quick Guide

[https://www.ag.ndsu.edu/pubs/plantsci/crops/a1173.pdf](https://www.ag.ndsu.edu/pubs/plantsci/crops/a1173.pdf)

<table>
<thead>
<tr>
<th>Date</th>
<th>% Maximum Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1</td>
<td>100</td>
</tr>
<tr>
<td>May 5</td>
<td>97</td>
</tr>
<tr>
<td>May 10</td>
<td>94</td>
</tr>
<tr>
<td>May 15</td>
<td>91</td>
</tr>
<tr>
<td>May 20</td>
<td>88</td>
</tr>
<tr>
<td>May 25</td>
<td>86</td>
</tr>
<tr>
<td>May 30</td>
<td>83</td>
</tr>
</tbody>
</table>

Estimated loss of efficiency if urea is surface applied with effective urease inhibitor is 0-10%.

*reference to a specific product should not be interpreted as a product endorsement.

Dave Franzen
NDSU Extension Soil Specialist
701-799-2565

Joel Ransom
Extension Agronomist for Cereal Crops

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**ESSENTIAL LOOK-UP SITES FOR APPLYING THE NEW DICAMBA FORMULATIONS REGISTERED FOR DT SOYBEANS**

For years applicators have been told that “everything you need to know about applying a pesticide can be found on the label”. That is still true, it’s just that elements of the label are now found in multiple locations, NOT just on the printed labeling on the container.

Beyond the federal label, applicators need to obtain a 24c or State and Local Needs Label. In North Dakota and Minnesota, you can go here to obtain a copy for your particular product:

- [http://www.mda.state.mn.us/dicamba](http://www.mda.state.mn.us/dicamba)

You can find accurate sunrise and sunset times for your **SPECIFIC** location via the U.S. Naval Observatory: [http://aa.usno.navy.mil/data/docs/RS_OneYear.php](http://aa.usno.navy.mil/data/docs/RS_OneYear.php)

The **OFFICIAL** NOAA Weather forecast by City or Zip Code can be found here, scroll down the page to obtain an hour by hour, printable Tabular Forecast: [https://www.weather.gov](https://www.weather.gov)
The NDSU Extension Pesticide Program maintains the North Dakota Auxin Training Verification Database. (In Minnesota the database will eventually be available through the Minnesota Crop Production Retailers):
https://www.ag.ndsu.edu/pesticide
The North Dakota Department of Agriculture maintains an Apiary and Sensitive Area Database. You can find that here:
https://beemap.ndda.nd.gov
The Minnesota sensitive crop registry can be found by becoming a registered user of FieldWatch:
http://www.fieldwatch.com
The following sites for your particular product must be consulted no more than seven days prior to application:
(Note, in 2017 the Office of the Indiana State Chemist found that of 109 completed dicamba investigations, 71% of applicators failed to comply with this specific label requirement.)

Engenia Tank Mix and Nozzle Site:
http://agro.basf.us/campaigns/engenia/tankmixselector/

FeXapan Tank Mix and Nozzle Site:

XtendiMax Tank Mix and Nozzle Site:
http://www.xtendimaxapplicationrequirements.com

For planning purposes and for consulting nearby weather conditions, especially air temperature inversions, go to the North Dakota Agricultural Weather Network at:
https://ndawn.ndsu.nodak.edu

Finally, whenever you visit these sites to comply with labeling, print a hard copy with a date for your records. Dated electronic files may also be acceptable, but you should check with your respective regulatory authority for proper documentation requirements.

Andrew A. Thostenson
Pesticide Program Specialist

AROUND THE STATE

NORTHWEST ND

The race is on to get crops planted in NW ND. Higher temperatures and sunshine have warmed up and dried out soils across the region. Planting of small grains, lentils, and peas continues and those with canola are eager to get it in the ground as soon as possible. Scattered showers on May 7th chased a few people out of the fields, but most areas received less than 0.1” and planters are out again today. There is a chance of showers on Thursday, May 10th, but aside from that, the weather should be conducive to planting. Cooler temperatures later this week will likely slow germination a little bit, but warmer and sunny conditions over the weekend should get crops planted last week and this week out of the ground.

Clair Keene
Extension Cropping Systems Specialist
NDSU Williston Research Extension Center
NORTHEAST ND

All counties have seeding activity as of last Thursday. Small grains, corn, sugarbeets and canola are going in. Soybean seeding has just started in the region. Farmers are carefully choosing how to spend their dollars on seed, fertilizer and chemical. Much of the region is reporting dry conditions and tough pasture conditions. 2017 dry soil woes in Benson County have gurgled over to this spring. Other areas have received rainfall or have leftover moisture from the fall, notably in the Northwood, Michigan, and Hensel areas.

Lesley Lubenow
Area Extension Specialist/Agronomy
NDSU Langdon Research Extension Center

SOUTH-CENTRAL

The region’s NDAWN stations indicate rainfall ranging from 0.7 inch (Dazey and Pillsbury) to less than 0.1 inch (Harvey and Tappen) during May 1-8. The topsoil moisture will aid plant establishment of previously planted small grain and corn as well as crops yet to be planted.

Growth of alfalfa and winter cereals is accelerating: established alfalfa is up to 12 inches in height, and winter rye and wheat are in the tillering stage. Barley seeded April 24 at the Carrington REC is emerging. The region’s small grain and corn planting should be at least 25-35 percent completed by the end of this week. Soybean planting has also started.

Weekly agronomy notes from the Carrington REC can be obtained by ‘liking’ or viewing the Facebook page: www.facebook.com/NDSUEextServ.CRECagronomy#!/NDSUExtServ.CRECagronomy

NDSU Crop Management Field School Scheduled for June 14 in Carrington

NDSU Extension’s annual crop management field school will be offered Thursday, June 14, starting at 9 a.m. at the Carrington REC.

Field sessions include:
* Weed identification - identify about 60 living weed exhibits, plus brief reviews will be provided on selected weed biology and control
* Herbicide site-of-action demonstration - identify herbicide classes by examining crop and weed injury symptoms
* Cover crops - review trials and results with small grain and row crops
* Measuring soil quality – review of field tools and tests
* Late-season wheat management - review of strategies for disease control and plant nutrition
* POST soybean herbicides - examine balance between crop injury and weed control

For further details and preregistration information, go to http://www.ag.ndsu.edu/CarringtonREC or contact the Carrington REC at (701) 652-2951.

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

Some more moisture has fallen in parts of the southwest in the past week from May 1st-May 8th. Here at the Dickinson Research Extension Center we didn’t receive any rainfall during that time, but scattered showers have helped the surrounding area. Soil moisture is still adequate throughout most of the southwest corner of the state, but we could definitely use a nice rain shower. The average bare soil temperature at the Dickinson NDAWN station shows 68 degrees Fahrenheit on May 8th. As the soil warms up some corn acres will begin to be put in, however it sounds like many are reducing the number of corn acres planted this year.

Winter wheat as a cash crop has gone down in acreage the past couple of years, but the winter wheat stands I’ve seen are looking good. Many decided to plant forage winter wheat this past year.

Small grains, canola, and pulses continue to be planted. Roads are full of sprayers, planting equipment, and anhydrous ammonia. Be sure to be patient on the roads and to give farm equipment the space that they need.

Ryan Buetow
Extension Cropping Systems Specialist
NDSU Dickinson Research Extension Center

WEATHER FORECAST
The May 10 through May 16, 2018 Weather Summary/Outlook

It is quite common for rain to fall with highly variable amounts from spot to spot in our region. That was certainly the case with the rain from Tuesday into Tuesday Night. East central North Dakota into portions of the central Red River Valley in Minnesota recorded rainfall from near 1 inch to over 1.5 inches from a slow moving upper-air disturbance in combination with some thunderstorms. Whereas much of central and western North Dakota recorded little if any rain. The graphic below shows the rain totals at the North Dakota Agricultural Weather Network (NDAWN) stations from May 1 through May 8. The totals do not include what fell yesterday (Wednesday, May 9).
With the exception of the past couple of days, most of May has been quite warm and dry. Average temperature departures from normal have been in the 4° to 8° above the current 30 year mean for much of the area so far this month. That warmth has ended for now with temperatures trending much cooler today (Thursday) into Saturday. The temperatures yesterday and what is coming the next couple of days is a reminder that spring usually comes in spurts. Warm periods followed by cool periods. We will occasionally get a spring that stays warm, but that is the exception rather than the rule. Temperature departures from average during the May 1 through May 8 period are presented below.

Far southern North Dakota may record some rain later tonight into Friday, but most of that storm is expected to stay in South Dakota into southern Minnesota. This means that much of our area will probably wait until early next week for our next rain possibilities. The most likely time frame next week look to be Tuesday/Wednesday. The cool air in place over the next 72 hours will be following by temperatures climbing to near or slightly above average Sunday/Monday. The rain possibilities next Tuesday/Wednesday will probably mean slightly cooler air again because of the cloud cover associated with the rain. What that all means is that growing degree days (GDDs) over the next week will be noticeably lower than what was recorded in the past 7 days. My projected GDDs from May 10 through May 16, based 50°, 44° and 32° is presented in the graphic below.
May 10 through May 16, 2018 Projected GDDs

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