

805 Odegard Ave SW • PO Box 70 • Cooperstown, North Dakota 58425
 Megan Vig, Agriculture and Natural Resources Extension Agent
 Alyssa Rickford, Extension Office Administrative Assistant

701-797-3312
 megan.vig@ndsu.edu
 alyssa.rickford@ndsu.edu

Rainfall and Growing Degree Days (GDD)

Location	Cooperstown	Finley	McHenry	Pillsbury
Barley/Wheat GDD (Plant date: 4/15/2017)	1290	1315	1321	1365
Compared to 2016	-158	-124	-63	-80
Corn GDD (Plant date: 5/1/2017)	499	496	499	546
Compared to 2016	-68	-43	-2	-17
Rain Since 4/15/2017	5.71	5.94	4.26	4.05

Note: Actual rain amounts may vary.

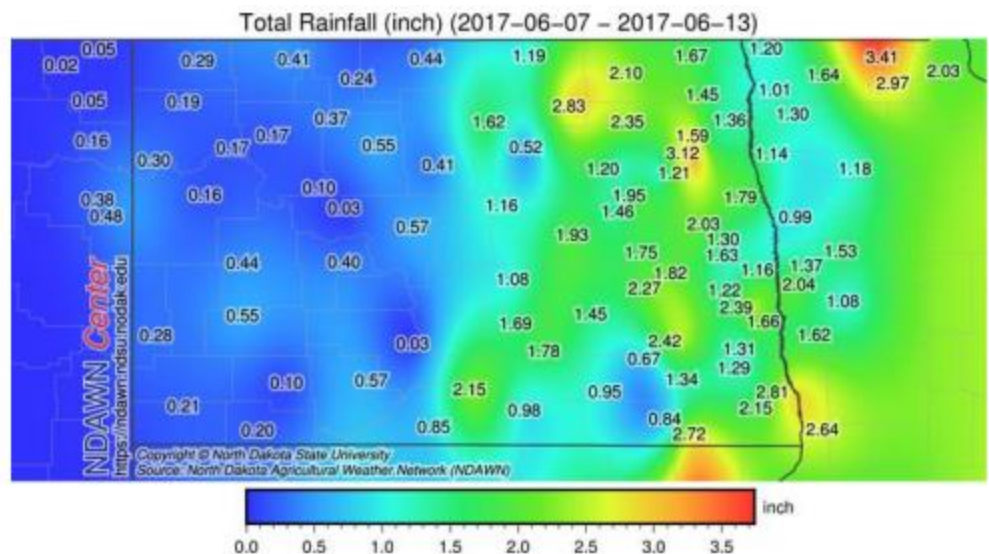
WEATHER

The June 15 through June 21, 2017 Weather Summary/Outlook

This past week was another warm period across much of the North Dakota Agricultural Weather Network (NDAWN). Temperatures were generally 4° to 8° above average with some exceptions near the North Dakota / Montana border and also into northwestern Minnesota where it was a bit cooler. After three weeks with above average temperatures it appears a cooling trend will be with us for most of this upcoming seven day period.

There were numerous rain events in the past week. Most of which were spotty and light. The exceptions were a fairly widespread rain last Friday evening across especially northeastern North Dakota and the other was two waves of rainfall on Tuesday. One in the morning and another on Tuesday evening. There was severe weather on both Friday and Tuesday causing some crop damage. The graphic below does not include the rain that fell on Wednesday because of writing deadlines for this publication. But several locations in northwestern and north central North Dakota recorded anywhere from 0.50 to 1.25 inches of rain on Wednesday, meaning that much of the region recorded beneficial rainfall in recent days after several weeks of mostly dry conditions. Southwestern North Dakota is a noticeable exception as the rain continues to miss that part of the state.

The same mechanisms that brought the rain to the region over the past week will also bring



an end to the recent stretch of above average temperatures. Several shots of cool Canadian air will move across the northern plains in the next 7 to 10 days. As each push of cooler air moves through, there will be periods of scattered thunderstorms, but no widespread heavy events are expected. Most of the activity will be associated with afternoon showers and thunderstorms developing with daytime heating. An “upper air disturbance” will move through the area on Saturday and it is on that day that the most widespread rain event is expected during this forecast period. Other days the precipitation will be hit and miss. With the cooler temperatures in place in combination with what precipitation has fallen recently, plus some additional moisture likely, stress to crops will lessen in the short term. The exception to this will be in southwestern North Dakota where the rains have been light and that area will probably not record much in the next week. These cooler temperatures will mean fewer growing degree days (GDDs). Most locations will be recorded approximately 25% fewer than last week. The projected GDDs for the next 7 days, Base 32°, 44° and 50° are presented below. With the cooler air and higher soil moisture content will come a few more hours with high relative humidity (RH) than what was recorded last week. But the Canadian air has low dew points associated it, meaning although there will be an increase in high RH hours over last week, the numbers would still be lower than average for this time of year.

Daryl Ritchison
Assistant State Climatologist/Meteorologist
Forecast Blog: ndsuh.edu/ndawnblog
(701-231-8209) Twitter: @darylritchison

ENTOMOLOGY

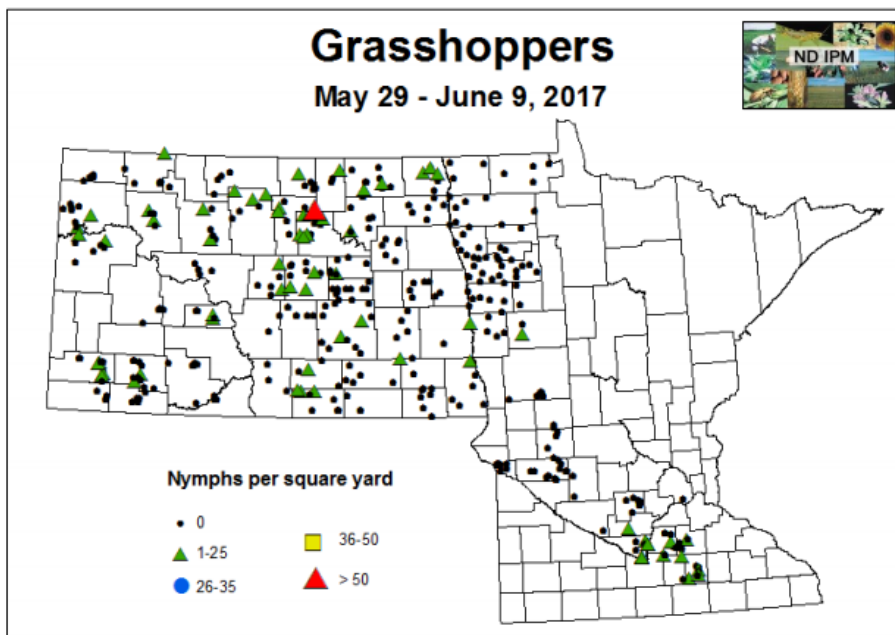
IPM Survey Insect Update

Wheat: Cereal aphids were present in 8% of the wheat fields surveyed by the IPM scouts in North Dakota. Aphid infestation levels are low overall and as high as 16% of stems with at least one aphid present. The action threshold for cereal aphids in small grains is 85% of the stems with at least one aphid present. Continue field scouting from stem elongation through the heading stage of wheat. Aphid populations at or above the thresholds during these growth stages will result in economic injury to plants. The greatest risk of yield loss from aphids feeding on grains is in the vegetative to boot stages. After the onset of flowering, significant yield losses do not occur.

Grasshoppers were observed in 20% of the fields surveyed by the IPM Scouts throughout North Dakota. Sweeping

for grasshopper nymph ranged from 0-60 nymphs per 4 sweeps. In field ditches, an action threshold is 50-75 nymphs per 4 sweeps (equivalent of one square yard). Overall, infestations are low in most areas, except for one hot spot in Benson County.

Soybean: One soybean aphid was detected in 1 field in Cass County at 3% of the plants infested in North Dakota. It also was reported at low levels of infestation in SW MN (Source B. Potter, UMN). Soybean aphids are beginning to move out of the buckthorn (overwintering host) and into soybean fields. Start scouting for soybean aphids. For a refresher on scouting, watch the NDSU Extension YouTube video on Scouting for Soybean Aphids.



Degree Day Update for Aphanthia Flea Beetles

To determine when to begin scouting for adult flea beetles, use the accumulated growing degree days (AGDD) for sunflower (base of 44 F) on NDAWN – sunflower degree days/growth stage application. Select the “Map” tab, enter “2017-03-01” for planting date and select “growing degree day” for map type

Begin scouting for adult flea beetles when the sunflower AGDD approaches 1,000. Flea beetles should be collected between 1,200 and 1,600 AGDD using the sunflower GDD model. Currently, North Dakota ranges

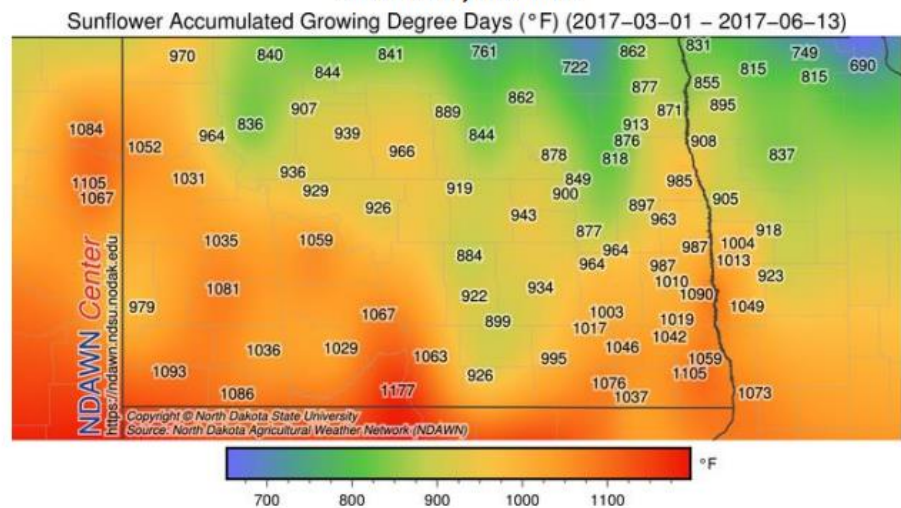
from ~800 AGDD in the northeast and northcentral to >1,000 AGDD in the southeast and southwest (see map below). The southern area of ND can continue scouting.

Adult flea beetles can be collected easily with sweep nets. After late July (or 1,600 AGDD), flea beetles begin to lay eggs and should not be moved or collected. Leafy spurge flea beetles typically take three to five years to establish and reduce leafy spurge infestations.

To find collecting sites for leafy spurge flea beetle, contact your local county weed office (number listed in local phone book). Leafy spurge flea beetles also are available commercially for purchase at Biological Control of Weeds or WeedBusters BioControl in Montana.

Janet J. Knodel
Extension Entomologist

Accumulated Growing Degree Days for Leafy Spurge Flea Beetles as of 06-13-2017, NDAWN.



PLANT SCIENCE

Small Grains are Short at Heading – Will it Impact Yield?

I received a call this week from a grower wondering why his wheat was so short as it approached heading. He explained that his crop had not suffered unduly from drought stress; it had tillered well, and had a nice green color. In my research plots and in growers' fields near Fargo that have already headed, that plants do seem abnormally short this year. In any given field, the determinants of the height of a small grain crop are genetics and the environment. The genetic expression of plant height is determined by air temperature and water stress. Drought stress reduces photosynthesis which in turn reduces the rate of plant growth. In response to this stress, however, the plants hasten development. With regards to temperature, small grains (wheat, oats, and barley) are cool season crops that develop their highest yield potential in relatively cool environments. Like water stress, warmer than optimum temperatures hasten plant development (the time between growth stages is shortened). When plant development accelerates because of temperature and/or drought stress, they tend to be smaller as do their spikes, leaves and tillers and end up being shorter in stature than is normal. Plant height is sensitive to these stresses when they occur prior to heading.

When I observed the shorter plants near Fargo, I assumed it was due to primarily to water stress as we are way behind on rainfall. However, subsurface moisture is still adequate in many fields as late fall rains recharged the profile. When I looked at growing degree accumulations and compared them to the previous two years (both of which were excellent for wheat yield), I was surprised to see that growing degree accumulations this year were very similar, so it appears that on average this spring has not been warmer than the previous two years. However, averages do not tell the entire story. This spring we have had colder than average temperatures for a couple of weeks, followed by warmer than average temperatures for a couple of weeks. I propose that one of those two-week periods that was well above normal for temperature corresponded to some key developmental stages that may have affected plant height.

Regardless, the important question is whether these shorter plants will have reduced yield. Generally a plant smaller will have a smaller spike and less yield potential. Never the less, small grain plants with reduced spike size have the ability

to add yield by increasing kernel numbers and increasing kernel size. One of my students, Nicholas Schimek, has become an expert in crop modeling, I asked him to run some simulations so that we could get a better handle on what the yield potential of our current crop might be. Accordingly, I had him run the DSSAT model using this year's weather data through June 12th followed by simulations for the remainder of the growing season using weather from each of the past 26 years. Although these are just computer based simulations, I think that they do provide some insight into the impact of our weather to date and the range of outcomes we might anticipate as the season continues (see Table 1). Since these data are from simulations, they must be viewed with some caution. Having said that, I think we can make the following useful observations:

- 1- This year's unfavorable early season weather has taken more than 10 bu/acre off the top in some areas.
- 2- Depending on the weather the remainder of the growing season, there is still considerable upside for yield in most regions of the state, if the weather for the rest of the season is favorable. In some locations, the expected "highest" yield could be respectable.
- 3- Just as there is a potential upside, there is a potential downside. Dry and warmer than normal weather has the potential for dragging yields down further. The recent rain that fell in some parts of the state was sorely needed, and additional moisture will be needed to carry the crop through flowering and grain fill. High temperature during grain fill as well as drought stress can be particularly damaging to yield.
- 4- It will be interesting to see how these simulated results compare to what is actually achieved at harvest in order to determine the value in simulation modeling.

Table 1. Simulated wheat yields (bu/acre) using the DSSAT crop model, with weather data from this season up to June 12 and weather data for the rest of the season from 26 previous seasons (26 separate runs, 1991-2016) at four REC in North Dakota. Cultivar used in these simulations was Glenn and planting date ranged from April 14 to May 2, depending on the actual planting date of experiments planted this year. Weather data were obtained from the NDAWN stations at each of the REC.

	Carrington	Langdon	Hettinger	Minot	Williston
Average of 26 runs	52	65	28	42	42
Potentially highest yield	76	81	39	63	62
Potentially lowest yield	29	47	17	21	22
Average of 26 years†	62	66	53	72	55

This is the average yield of the location running simulations over 26 growing seasons, using weather data for the entire season for that particular year, whereas the first row of yields in this table were obtained using this year's weather data up to June 12th, which was then followed by the weather data from June 12 to harvest for 26 previous crop years.

Joel Ransom
Extension Agronomist for Cereal Crops

Nicholas Schimek
Graduate Student, Plant Sciences

SOILS

Fertilizing Alfalfa Following First Cutting

The ideal time to fertilize alfalfa is following first cutting. For most of the state this is now, before regrowth takes off. Following soil test results, if the phosphorus level is 11 ppm or below, application of 100 pounds 11-52-0 per acre would pay premiums of greater hay yield in the future. In addition, alfalfa hay harvest takes off about 50 pounds K₂O per ton. If the previous year hay crop was 4 ton, and 1 ton was removed at first harvest, then the grower should consider the application of 5 X 50 pounds K₂O, or 250 pounds K₂O, or a little over 400 pounds 0-0-60 per acre to replace its loss IF soil test K is less than 200 ppm. If the soil test K was more than 200 ppm, then thank your field for the favor and K replacement is not necessary to sustain good yields. A revision of the alfalfa fertility circular will be published later this summer with more specific recommendations.

Dave Franzen
NDSU Extension Soil Specialist

APPS for AG



Figure 1. Yellow banner on home screen will display important pest and pesticide information.

Andrew Friskop
Extension Plant Pathology, Cereal Crops

New Features for NDSU Extension Pest Management App

The NDSU Extension Pest Management App (which houses information from the Plant Disease Management Guide, Insect Control Guide and Weed Control Guide) has recently been updated with new features. These features include a banner, a pest identification help tool and calendar function. The banner is displayed on the home screen of the app and will highlight important pest and pesticide information throughout the growing season (Figure 1). The pest identification help tool allows for digital diagnosis of pests through photos submitted by app users (Figure 2). This will help with preliminary assessments of pests, but for a more complete diagnosis, individuals may be asked to submit samples to the NDSU Plant Diagnostic Lab. The calendar function provides information on upcoming Extension events (Figure 2).

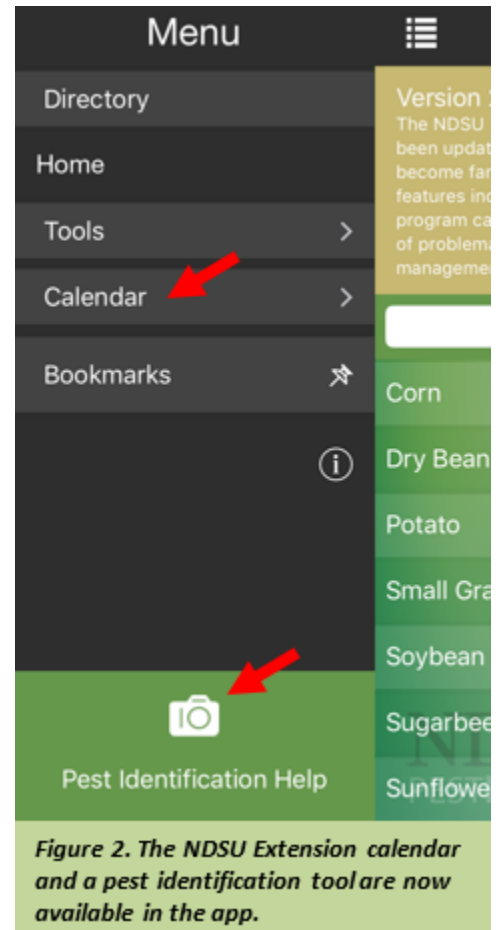


Figure 2. The NDSU Extension calendar and a pest identification tool are now available in the app.