North Dakota State University
CROP & PEST REPORT
NDSU Extension Service

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entomology

PROTECT OUR HONEY BEES FROM INSECTICIDE POISONING WHEN SPRAYING FLOWERING CROPS

Honey bees and native pollinators are a vital part of our agricultural food production. The value of bee pollination is estimated at 14.6 billion dollars in the U.S.! With the reduction in numbers of both domestic and wild bee colonies due to Colony Collapse Disorder and other diseases, the value of honey bees, native bees and pollination has increased. This increases the importance of protecting all bees including native pollinators from pesticide poisoning.

Honey bee at flower
(Photo courtesy of J. Knodel, NDSU)

Bees are attracted to blooming field crops (especially alfalfa, canola and sunflower) and even weeds (dandelion, wild mustard, white clover, goldenrod, etc.) in the field for nectar and/or pollen. Bees are attracted to plants that produce sweet exudates from extrafloral nectaries or from aphids feeding on plants. Pools of water in fields may also attract bees, especially during dry periods.

Because bees forage up to 2.5 miles or more from their hive, all beekeepers within 2 to 3 miles of the area to be treated should be notified several days before the insecticide is to be applied. The names of beekeepers in your area can be obtained by going to the North Dakota Department of Agriculture website.
http://www.agdepartment.com/PDFFiles/2011BeekeepersList.pdf

Producers / Agronomists can reduce pesticide hazards to bees by following these general guidelines:

- Know and communicate with beekeepers about bee hive locations.
- Use chemicals with low toxicity and low residual to bees. For example, avoid using dusts or wettable powder formulations of insecticides, which are more toxic to bees.
- Evening or night applications are the least harmful to bees. Early morning is the next best time when fewer bees are foraging.

- Timing of insecticides and residues in respect to bee poisoning hazard can be affected by weather conditions. If temperatures are unusually low following treatment, residues on the crop may remain toxic to bees up to twice as long as during reasonably warm weather. Conversely, if abnormally high temperatures occur during late evening or early morning, bees may actively forage on the treated crop during these times.
- Do not spray when winds can cause drift, and use ground application instead of air where possible.
- Use economic thresholds for making chemical control decisions for insect pests and other Integrated Pest Management strategies for controlling insect pests when possible. Economic thresholds ensure that pesticides are used only when crop losses prevented by pesticide use are greater than the cost of the pesticide and the application.

Use all pesticides in a manner consistent with label directions. Labels may include specific restrictions that protect bees.

Insecticides affect bees as stomach poisons, as contact poisons, and as fumigants, and vary in their toxicity to bees. Some of the common insecticides used in field crops and their residuals are listed in Table 1.

Table 1. Length of Residual Toxic Effects of Selected Insecticides to Honey Bees

Class of Insecticide	Insecticide Active ingredient (Trade name)	Residual (in days)
Carbamate	Carbaryl 4F (Sevin)	3-7
	Carbaryl WP (Sevin)	3-7
	Carbaryl XLR (Sevin)	>1
Organophosphate	Acephate (Orthene)	>3
Organophosphate	Chlorpyrifos EC (Lorsban, Nufos)	4-6
Organophosphate	Dimethoate	3
Pyrethroid	Bifenthrin (Tundra, Brigade, Sniper)	>1
Pyrethroid	Cyfluthrin (Baythroid)	>1
Pyrethroid	Esfenvalerate (Asana)*	1
Pyrethroid	Lambda-cyhalotrhin (Warrior, Taiga Z)	>1
Pyrethroid	Zeta-cypermethrin (Mustang Max)	>1

*Toxicity reduced by bee repellency in flowers under arid conditions.

Mention of any trade names does not imply endorsement of one product over another nor discrimination against any other product not listed by North Dakota State University Extension Service or the author.

Source: "How to Reduce Bee Poisoning from Pesticides" from a Pacific Northwest Extension publication: http://extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf

BEAN LEAF BEETLE IN SOYBEANS

Economic numbers of bean leaf beetles have been reported near the Woodworth area in Stutsman County. With more soybean acreage in North Dakota, bean leaf beetle populations have been slowly increasing over the past years. Adult bean leaf beetles emerge from overwintering sites and move into soybean or dry bean fields during the seedling stage. Adults are yellow to reddish-brown and have three to four black spots with a black border on wing covers. The white larvae develop in the soil, feeding on the roots and nodules. New adults emerge in August and feed on foliage and pods. Feeding injury to leaves appears as small round holes between the leaf veins. Injury to pods appears as lesions similar in size and shape to leaf-feeding holes. The injury to pods results in secondary infections by fungi and bacteria, causing rotting and discoloration.

Bean leaf beetle *(Photo courtesy of J. Lawrence, Eurofins Agroscience Services, Bugwood.org)*

Treatment thresholds from other regions are **3 to 7 beetles per sweep or based on defoliation - 50% defoliation during early vegetative, 40% defoliation during pre-bloom, 35% defoliation during bloom and 20-25% defoliation or 10% pod feeding (or the presence of clipped pods)**. Late season feeding on the foliage and pods by the new adults that emerge in August appears to be more important than early season feeding. This may increase the risk of virus transmission and cause secondary infections (rotting and discoloration) from fungi and bacteria.

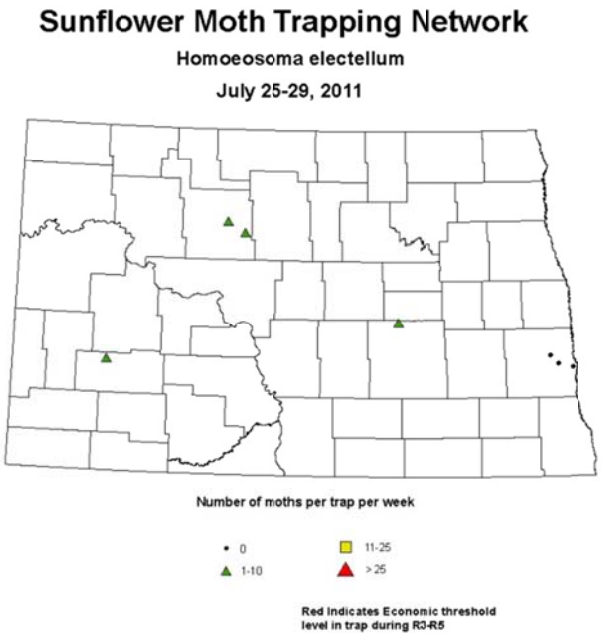
SOYBEAN APHID UPDATE

Soybean aphid infected with Pandora neoaphidis ***(Photo courtesy of K. Koch)***

Soybean aphids have increased above economic thresholds in several areas now. This year, each field is different and scouting is the only way to determine if your field is above the economic threshold (average of 250 aphids per plant and 80% incidence in the field). Some areas have had severe thunderstorms and high winds, which have washed aphids off of plants and drowned them. When scouting for aphids, you also may have noticed several brown aphids that are dead. These are most likely infected with a beneficial fungal entomopathogen that suppress soybean aphid populations when environmental conditions (cool, wet, humid) are conducive for fungal infection. Several species of fungi have been found to infect soybean aphids in North America, with *Pandora neoaphidis* being the most commonly encountered.

SCOUT FOR SUNFLOWER MOTHS

Sunflower moth ***(Photo courtesy of J. Knodel, NDSU)***



Sunflower moths migrate into North Dakota from southern states and do not overwinter here. Because of the migratory nature of this insect, it is only an occasional pest in North Dakota, but can be a very damaging insect pest when it does reach North Dakota and populations are high. So, it is important to scout for the adult sunflower moths when looking for other head-infesting insect pests, such as banded sunflower moths or red sunflower seed weevils. A typical infestation is usually localized and not region wide. Pheromone trapping from the IPM scouts in North Dakota indicates that a low number of sunflower moths have moved into the central region of North Dakota (see IPM Survey map). This grayish-tan moth moves into fields in early bloom. Female moths deposit eggs on the face of the flower. Larvae feed on florets, pollen, and seeds and tunnel through the head. Larval infestations can cause 30-60% head loss. Since female moths lay eggs on the face of sunflower heads, insecticide should be applied in early flowering (R5.1 - R5.3).

Action Threshold: When 1 to 2 moths are found for every 5 plants inspected, treatments should be considered.

WHAT INSECT IS THIS?

On soybean leaf with soybean aphids ***(Photo courtesy of P. Beauzay)***

I've received many calls about what insect this is? Since it is often attached to the leaf of wheat or soybean plants, is it sucking the sap and killing the plants? The answer is good news. This is the pupal stage of a lady beetle, which is a beneficial insect. Lady beetles go through four different life stages during development: egg, larva, pupa and adult. Adult beetles can eat up to 200 aphids per day and larvae are equally voracious predators of aphids and other soft-bodied insects. As a producer, agronomist or crop consultant, it is important to recognize good versus bad insects in a field as well as their different life stages. If you need help with identification, please email digital photographs or mail samples into the Plant Diagnostic Lab or Extension Entomology (Pat Beauzay or Jan Knodel).

NEW EPA PESTICIDE DATABASE

EPA is releasing a new Pesticide Product Label System (PPLS) Web application. PPLS is a collection of over 170,000 current and historical pesticide product labels that have been approved by EPA's Office of Pesticide Programs under the Federal Insecticide, Fungicide, and Rodenticide Act. This new version of PPLS contains many enhanced features to help users locate the labels they need. Using the new system, you will be able to:

- Search by product name
- Search by company name
- Search by EPA Registration Number
- View labels in PDF format
- Search label content
- View the history of products that have been transferred from one company to another

This improved Web application furthers EPA's goal of transparency and can be viewed at http://www.epa.gov/pesticides/ppls.

PEST MANAGEMENT FOR STORED GRAIN INSECTS

Confused flour beetle. ***(Photo courtesy of Clemson University, USDA Coop. Ext. Slide Series, Bugwood.org***

Now is the time to clean your storage bins to prevent potential stored insect problems through good bin management. Several species of insects infest stored grains, such as, confused flour beetle, Indian meal moth, rice weevil, lesser grain borer, and red flour beetle. Damage caused by these insects includes reduced grain weight and nutritional value, contamination, odor, mold, and heat damage, all of which lowers grain quality.

Good grain bin management practices include:

1) Before treating with a protectant, make sure that the bins are free of insect-infested grain. Leftover grain should be removed from the bin, and the walls should be swept and vacuumed. All grain handling equipment, including augers, combines, trucks and wagons, should be thoroughly cleaned and grain residues removed before harvest.

2) A residual bin spray, such as malathion, Tempo, or Storcide II should be applied to all interior bin surface areas 2 to 3 weeks before new grain is placed in the bin. The treatment will kill insects in their hiding places (cracks, crevices, under floors and in aeration systems). Also, insects crawling or flying in from the outside will be killed. Apply the spray to as many surfaces as possible, especially joints, seams, cracks, ledges and corners. Spray the ceiling, walls and floors to the point of runoff. Use a coarse spray at a pressure of more than 30 psi and aim for the cracks and crevices. Spray beneath the bin, its supports, and a 15 ft border above the base of the outside foundation. Treat the outside surface, especially cracks and ledges near doors and fans.

3) Remove any vegetation or weeds that may attract and harbor insect pests within 10 ft of a bin and preferably the whole storage area. Follow by spraying the cleaned area around the bin with a residual herbicide to remove all undesirable vegetation.

4) Repair and seal all damaged areas to grain storage structures. This helps prevent insect infestation and reduces water leakage which leads to mold growth.

5) Whenever fans are not operated, they should be covered and sealed to reduce the opportunity for insects and rodents to enter the bin through the aeration system.

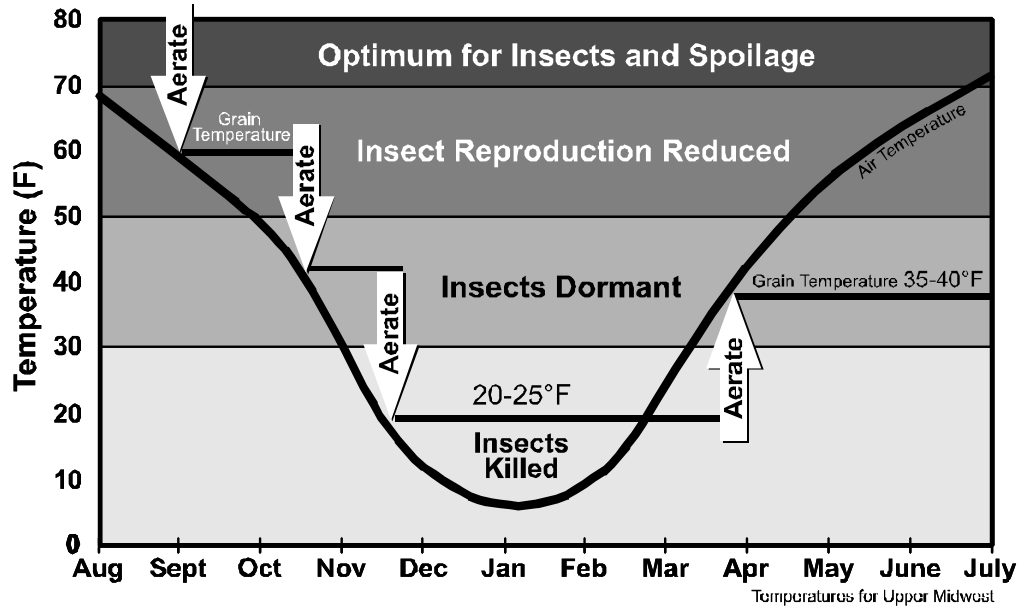
6) If newly harvested grain and/or insect-free grain must be added to grain already in storage, the latter should be fumigated to prevent insect infestation.

7) It is recommended that grain be treated with approved insecticides as it is augered into the bin if it will be in storage for one or more years. Grain protectants kill insects as they crawl about or feed on treated grain and/or grain fragments. Do not apply grain protectants prior to high temperature drying because extreme heat will result in rapid volatization and reduced residual qualities of the pesticides. Grain protectants applied to 13% moisture grain will have a greater residual life than grain at 15% or great moisture.

After binning, some grain protectants may be applied as a surface treatment "top dress" to control surface feeding insects, such as Indian meal moth larvae. Insecticide product should be applied into the top few inches to improve efficacy.

When temperatures are above 50 F, bins should be inspected for insect activity every two weeks. Stored grain insect pests are generally inactive at temperatures below 50 F (see chart below).
Please consult the *2011 Field Crop Insect Management Guide* for a complete list of stored grain insecticides.

Cool Grain to Prevent Storage Problems



*Prevent crusting due to moisture migration by cooling grain to within 15 F of average outdoor temperatures
*Cooling grain by 10 F doubles its allowable storage time

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plant science

COVER CROPS PLANTED IN AUGUST

Before using cover crops in the cropping system, it is important to decide what the purpose is of the cover or forage crop. Using a mixture of cover crop species may allow producers to meet several goals simultaneously. Mixtures add more diversity, may be able to better compete with weeds, optimize nutrient cycling, and use the available moisture in a more efficient manner. Creating conditions beneficial to the next crop (mellowing the soil and or addition of biologically fixed nitrogen) is usually one of the primary goals of planting a cover crop. Water use by a cover crop during the period after the main crop has been harvested might be another objective in this relatively wet year.

In North Dakota, spring wheat seeded in the early spring will be harvested in early August. The average first killing frost in the fall is around the 20th of September in central ND. This period from wheat harvest to the first killing frost is available for additional forage or biomass production. If a mixture of more cold tolerant species is included in the plant mixture, the growing window may be extended well into October.

In 2010, we seeded three crop mixtures into spring wheat and winter wheat stubble after harvest and took biomass samples on October 8th. Samples were also taken from plots with only volunteer wheat. Both the winter wheat and spring wheat produced volunteer plants. Wheat was a significant competitor with the seeded cover crop as can be seen in photo 1.


Photo 1


Photo 2

Winter wheat volunteers remained vegetative and relatively prostrate. Table 1 indicates that from wheat harvest to October, mixture 2 produced the most biomass in winter wheat stubble. The dominant species were kale, turnip, and daikon radish (see photo 2). There was no difference in biomass between volunteer spring wheat and any of the cover crop mixtures. In this case, the volunteer spring wheat would have been a better financial choice as no cover crop seed was needed.

The biomass can either be worked into the soil or used for animal feed. The percent crude protein is also indicated in Table 1. If a producer wants to plant a crop of production winter wheat, it is essential that all small grain volunteers and grassy weeds be killed at least two weeks before planting in order to avoid a green bridge that will permit the movement of the wheat streak mosaic virus into the developing crop.

The data can be used to predict the potential development of a small grain or cover crop seeded on prevent plant acres by the first part of August.

Table 1. Dry matter, height and crude protein of cover crops seeded into winter and spring wheat stubble directly following harvest in 2010.

Cover crop[1]	Lb/acre biomass (dry weight)	Height at harvest in inch	% crude protein
	Cover planted into winter wheat stubble		
Mix 1	3850bc[2]	8.6a	18.2ab
Mix 2	5312a	9.1a	15.3b
Mix 3	4400b	8.2a	15.6b
Winter Wheat volunteers	3239c	7.8a	18.6a
	Cover planted into spring wheat stubble		
Mix 1	3230a		16.1a
Mix 2	3418a		15.7a
Mix 3	3104a		15.9a
Winter Wheat volunteers	3575a		15.1a

[1]Cover crop mixture 1, non-dormant alfalfa, Persian clover, common vetch, and red clover.
Crop mixture 2, common lentil, kale, turnip, daikon radish and berseem clover.
Crop mixture 3, a mix of the above two mixtures.
[2]Only means in winter or spring wheat section should be compared. If the letter behind means is similar, there is no significant difference at P≤0.10.

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plant pathology

CONTROLLING CERCOSPORA LEAF SPOT WITH FUNGICIDES

Cercospora leaf spot is the most devastating foliar disease of sugarbeet in Minnesota and North Dakota. The disease is caused by the fungal pathogen *Cercospora beticola*. The fungus overwinters in infected sugarbeet debris in the field. Cercospora leaf spot develops rapidly in warm, humid and wet conditions, typically after canopy closure. Day temperatures of 80-90 F and night temperatures above 60 F favor disease development. Day temperature above 93 F is unfavorable for disease development. Typical foliar symptoms are circular spots about 1/8 inch in diameter with ash gray centers and dark brown or reddish-purple borders. Under favorable conditions, the fungus may have 4 to 5 disease cycles during the season, and with each cycle there is a substantial increase in the amount of inoculum. As such, early control (at first symptoms) is necessary to effectively manage the fungus. Since the fungus damages the leaves, it adversely impacts the photosynthetic capacity of plants and reduces yield; the disease also results in higher impurities in the juice which reduces sucrose extraction.

Research shows that application of effective fungicides at first symptoms with subsequent applications based on the presence of leaf spots and favorable environmental conditions (Daily Infection Values for two consecutive days of 7 or higher) consistently provided the most effective and economical control.

Sugarbeet fields with more susceptible varieties that closed rows the earliest and are close to shelter-belts, waterways, and those close to previously infected fields should be the first to be scouted since they would be the first to become infected.

Guidelines that will help in effective disease control include the following:

1. The first fungicide application should be made when conditions first favor disease development or at first symptoms. If the first application is late, control will be difficult all season.
2. Use the recommended rates of fungicides to control Cercospora leaf spot - do not cut rates.
3. Only one application of Topsin in combination with a protectant fungicide, such as Supertin, should be used during the season. When mixing fungicides, use ¾ of the labeled rate of each fungicide.
4. The fungicides that were most effective individually and in rotations at Foxhome, MN in 2010, were Headline 2.09 EC, Proline 4SC with a non-ionic surfactant, Inspire XT, Supertin 4 L, and a mixture of Supertin 4L and Topsin 4.5 F.
5. Never use the same fungicide or fungicides from the same class 'back-to-back'.
6. Avoid using fungicides of a particular class of chemistry as a stand-alone where there is known resistance to that chemistry.
7. If using one application per year, do not use the same product year after year – resistance will develop.
8. Use of high spray pressure (100 psi) and high water volume of 15 to 20 gal/ac will result in better disease control.

Sugar price is favorable for growers. As such, growers should make an extra effort to get the highest recoverable sugar per acre possible to reap the benefit of a good sugar price. Most growers have done an excellent job of controlling Cercospora leaf spot resulting in low levels of Cercospora inoculum. Current conditions are very favorable for disease development. Fungicides should be applied as soon as first symptoms are observed. Fungicides typically provide 14 days of protection under heavy disease pressure. Scouting of fields will contribute to better disease control since it helps in better timing of fungicide applications.

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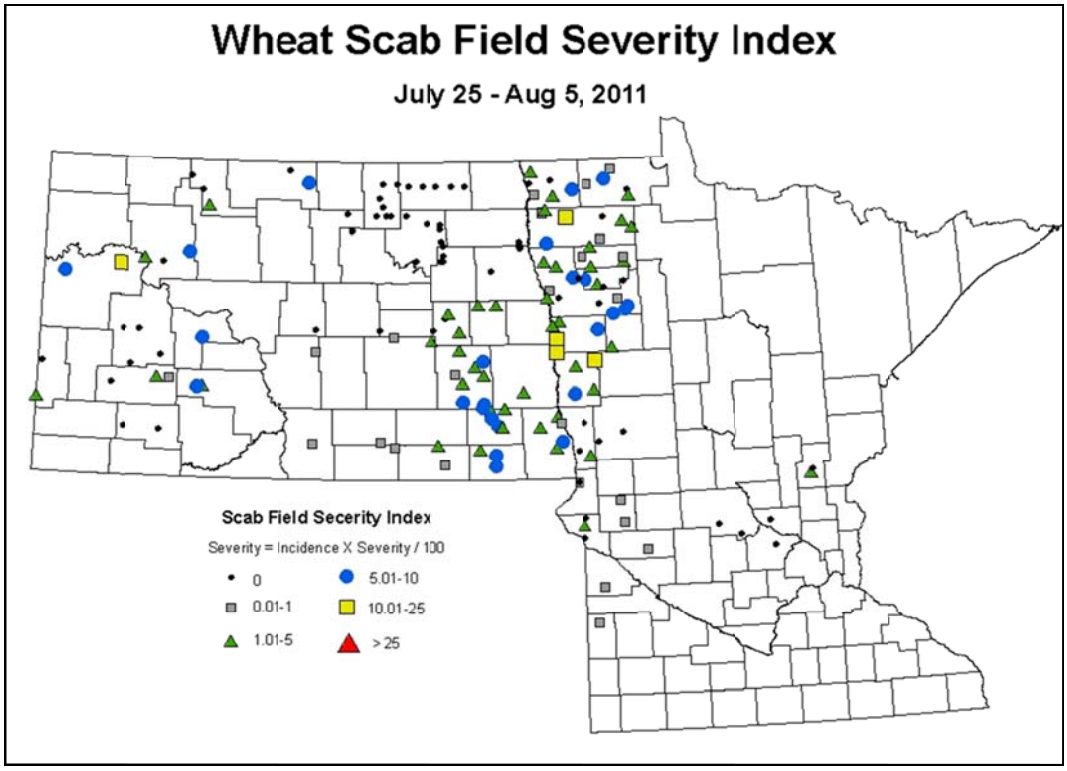
SMALL GRAIN DISEASE UPDATE

NDSU IPM field scouts surveyed 103 wheat fields in ND from July 25 through August 5. The average growth stage of these fields, as of Aug. 5, was soft dough stage. NDSU scouts surveyed 12 barley fields in this two week period. NDSU scouts also surveyed 172 soybean fields during this same time frame. Observations of the scouts can be viewed on the IPM maps posted at: http://www.ag.ndsu.nodak.edu/aginfo/ndipm/.

Wheat: Tan spot and/or leaf spots from fungi in the Septoria leaf spot complex were evident in all wheat fields surveyed. Barley yellow dwarf symptoms and bacterial leaf and head disease symptoms also were common, with 30% of surveyed fields in this time frame showing barley yellow dwarf symptoms and 42% showing both bacterial leaf streak and the associated bacterial black chaff symptoms.



Reports of Fusarium head blight (scab) increased also, with 48% of surveyed fields with some symptomatic heads. Field severity (incidence of infected tillers x head severity) was still relatively low, with an average of 4.2%, although scab field severity ranged from 0.1% to 37%. Similar levels were also seen in wheat fields surveyed in Minnesota.

Leaf rust detections and scoring of variety plots was done by Dr. Maricelis Acevedo, NDSU Plant Pathologist, during the weeks of July 25 and Aug. 1. She found susceptible rust reactions in varieties such as Faller and Prosper, varieties with the Lr21 gene for leaf rust resistance. This confirms the identification of new races of the leaf rust pathogen, *Puccinia triticina,* carrying Lr21 virulence in the ND and MN area, first reported by Dr. Jim Kolmer, USDA Cereal Disease Lab, in leaf samples collected in 2010. In the 103 commercial wheat fields surveyed by the IPM scouts, however, leaf rust was reported in only two fields in the western region of the state. Many commercial wheat fields may have been sprayed with fungicide, which generally is very effective in managing leaf rust, if applications are timed appropriately.

Barley: Of the few barley fields surveyed during the weeks of July 25 – August 5, the majority of the fields had some level of leaf infection on the flag leaf, and scouts reported either net blotch, Septoria sp., or spot blotch. It has been very difficult to determine if Fusarium head blight occurred on barley this year, because of the rapid ripening of the heads during the very hot period in July. In field plots of Tradition barley in Fargo, very little typical kernel infections by the scab fungus were observed. DON (vomitoxin) tests will be done on these plots.

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I'LL NEVER APPLY FALL NITROGEN AGAIN!

I have heard several growers exclaim that they will never fall apply nitrogen again. Although fall-applied fields often suffered more loss than spring-applied fields, it is not always the case. Growers that applied late in the fall when our recommendations would suggest it was safer are more satisfied with their results than those that were early. For those who cannot recall our recommendations for fall nitrogen timing, here they are again.

1. Do not fall apply N on soils that typically flood in the spring or to soils with sandy loam or coarser textures.
2. Do not even think about applying anhydrous ammonia until October 1.
3. After October 1, check the soil temperature measured at 4 inch depth from 6-8AM. When it hits 50 F, it is practical to apply anhydrous ammonia (but not urea!)
4. A week after the date for anhydrous ammonia, growers can start applying banded urea.
5. 2 weeks after the date for anhydrous ammonia, growers can start broadcast-incorporating urea.

This past season, the date the soil temperature dropped to 50 F was about October 15. That means that banded urea application should not have begun until October 22 and broadcast urea until October 29.
I know that a great deal of fall N was applied before these dates. I know that I traveled to Bismarck for a meeting about September 20 and there was a grower applying anhydrous ammonia to a field near Jamestown. I also saw urea applicators in the field about the same time in the Valley. This was a very bad plan.

There is nothing wrong with well-timed fall N application in North Dakota. In years of dry weather, it didn't matter when nitrogen was applied. If the last 18 years of wetness is an indication of the beginning of a trend, I think that this winter and spring will also be wet and we will be set up for losses for N that was applied too early. Agronomy does not always mesh with convenience. Although many growers have a 'harvest gap' in September after small grain harvest and before soybeans/corn/sunflower, it is not the time to fall apply N. P and K can be applied during this time, but not N. Too many bad things can happen to early applied N if it is applied too early with too much fall ahead of it.

A nitrification inhibitor should be used not to move the date of application earlier, but to protect the N-applied at a safer date from unanticipated losses from early spring wetness. N-Serve™ can be applied with anhydrous ammonia to protect N from losses due to nitrification in the fall/spring. Instinct™ is an encapsulated form of nitrapyrin (active ingredient in N-Serve), and the label I have currently lists it as a spring additive with urea or UAN. Check with your Dow-Agro Sciences rep to see if it is labeled for fall application with urea. In the spring, products with the additive DCD (examples are Super-U™ by Agrotain, Int., or Guardian™ by Conklin) will also slow nitrification. One product that is sold as a nitrification inhibitor, but does not function like one is Nutrisphere™. It is neither a nitrification inhibitor nor a urease inhibitor and should not be used as one.

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WEEDS SHOW DIFFERENT RESISTANCE MECHANISMS TO GLYPHOSATE

Most are aware and can name weed biotypes that have become resistant to glyphosate. Weeds that have been found resistant to glyphosate and other herbicides in ND and the U.S. are summarized on pages 102-103 in the ND Weed Control Guide. Determining the mechanism of resistance or by what means plants escape the phytotoxicity of glyphosate has become a lengthy process and the results surprising. The process is not complete but scientists are finding different resistance mechanisms in different species.

In contrast, weed resistance to ALS herbicides are rather simple and involves an altered target site - genetic mutations within a herbicide site of action can prevent complete herbicide interaction with binding sites, allowing the target-site protein to remain functional. The incomplete inhibition of the altered site of action may result in little to no observed plant injury. Where the herbicide has such little inhibitory effect on the site of action, plants may survive greater than 10 times the normal herbicide rate (considered high-level resistance). Modes of action where high-level resistance is most often seen include ACCase, ALS, and photosystem II inhibitors.

How is horseweed (marestail) resistant to glyphosate? Recently a team of scientists from Washington University in St. Louis and Monsanto followed molecules of glyphosate after absorption by tracking the chemical fate of P (phosphorus) contained in the glyphosate molecule. Scientists were able to distinguish the glyphosate signal from those of other phosphorus-bearing plant metabolites. They found a major signal from glyphosate in the plant vacuole, a large water-filled compartment found in all plant cells that can serve as a garbage disposal for chemicals foreign to the plant. Within 24 hours, resistant horseweed had shuttled 85 percent of the glyphosate into the vacuole. Sensitive horseweed transport only 15% of glyphosate to the vacuole. Once glyphosate gets to the vacuole it is trapped so less is available for translocation to susceptible areas.

Does waterhemp and amaranth species have the same mechanism? Some other glyphosate resistant species may use the same mechanism, but it appears there is at least another mechanism of glyphosate resistance. Scientists at Colorado State University, the USDA, and the University of Adelaide in Australia have found certain variants of Palmer amaranth (a type of pigweed). These Palmer amaranths have become resistant by overproducing the EPSPS enzyme to the point that it cannot all be bound by glyphosate. Many of these plants have up to 100 copies or more of the EPSPS gene and produce more target site enzyme than glyphosate can fully inhibit. This case is the only known example of this type of mechanism.

So how is this information helpful to growers and those who depend on glyphosate for weed control? Mother Nature ALWAYS wins. It appears that weed resistance has taken a leap forward in complexity. Different weed species can develop different resistance mechanisms to the same herbicide. This does not change the recommendations to use crop and herbicide rotation to delay resistance and to scout fields, detect lone plants or small patches, and to kill plants possessing that resistant gene, so it doesn't increase.

Can this information help to increase weed control and herbicide longevity? Probably not with waterhemp/amaranth, but scientists noticed a differential response in horseweed when glyphosate was applied at different temperatures. Horseweed plants maintained at room temperature had much more rapid vacuole sequestration, but cold-acclimated resistant horseweed (50 F) plants were much more susceptible to glyphosate. Mining Monsanto's weed control database validated this finding. Resistant horseweed sprayed with glyphosate in early spring showed that kill rates correlated with temperature under field conditions was the same as under laboratory conditions. These experiments suggest farmers might be able to improve control of resistant horseweed by spraying in early spring, when the weather is cooler.

Summary: Mother Nature ALWAYS wins - plants are sophisticated, extraordinarily complex, and masters at survival.

MRL INFORMATION FOR SHARPEN USED AS A DRY BEAN DESICCANT

The following information is provided by BASF in regard to Sharpen used as a dry bean desiccant. There has been concern expressed about the prohibited residue of some export countries.

Sharpen Herbicide was recently registered by EPA for use as a Harvest Aid/Desiccant for Dry Edible Beans. Maximum Residue Levels (MRL's) are established for the domestic consumption in the US and export to Canada and Mexico. A petition has been submitted to the European Union (EU) and we anticipate MRL establishment in 1Q of 2012. Likewise, a petition has been submitted to Japan for MRL establishment, but we are unable to provide a projected timeline for approval in Japan.

Dry Edible Bean Varieties:

- Pinto Beans - primarily domestic U.S. or Mexico consumption. These are 60% of the edible beans in ND and N. MN.
- Blacks - little concern as consumption is primarily United States, Mexico, and government funded sales to 3rd world countries.
- Navies - these are primarily shipped to European countries. It is worth being aware that BASF anticipates this MRL approval in 1Q of 2012, so please take into consideration your planned sale/shipment to Europe.
- Kidney's - smaller, concentrated acres (ie Park Rapids, MN area) - these are heavily scrutinized and managed. Majority of local production does go to Japan where the timeline for MRL approval is uncertain.

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CARRYOVER TO SUGARBEET FROM DRY BEAN DESICCANT HERBICIDES

In 2010, several sugarbeet fields had significant stand loss where Valor was applied to dry beans as a desiccant herbicide in 2009. In the fall of 2010, a desiccant herbicide trial was established at two locations. One site had a course soil texture and the other site had a fine soil texture. Valor was applied at 2.0 oz/A and 4.0 oz/A (twice the normal rate to simulate overlap conditions) and Sharpen was applied at 2.0 fl oz/A and 4.0 fl oz/A (twice the normal rate to simulate overlap conditions) to soybeans (to simulate dry beans due to last year's early harvest) on August 27, 2010 and September 21, 2010. Sugarbeet were planted on May 25, 2011 at the course-textured site and on May 26, 2011 at the fine-textured site. On June 20, 2011 no sugarbeet stand loss was observed from any treatment applied last fall at the fine-textured site. However, on June 20th, sugarbeet stand loss occurred with some of the treatments at the course-textured site. Valor applied at 2.0 oz/A on August 27th and September 21st caused 2% and 17% sugarbeet stand loss, respectively. Valor applied at 4.0 oz/A on August 27th and September 21st caused 30% and 40% sugarbeet stand loss, respectively. Sugarbeet stand loss ranged from 0 to 4% for Sharpen applied at all rates and times at the course-textured site. Despite little stand loss from the Sharpen, some slight stunting of sugarbeet plants was observed on July 16th where Sharpen was applied at 4.0 fl oz/A on September 21st.

At this time, due to the significant sugarbeet stand loss in several commercial fields in 2010 and the results presented above, Valor should not be applied as a dry bean desiccant herbicide if sugarbeet will be planted in 2012. The courser the soil texture and the shorter the time period from the Valor application to planting of sugarbeet, the greater the risk of sugarbeet stand loss. Sharpen appears to be a safer choice as a dry bean desiccant herbicide if sugarbeet will be planted in 2012; however, the research trial mentioned above has not been harvested to know if any yield loss will occur from the Sharpen even though no stand loss occurred.

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forestry

GALL INSECTS COMMON ON TREES

Galls are created by many different arthropods (aphids, pysllids, mites, and eriophyid mites). This gall is the hackberry nipplegall on hackberry and is caused by a psyllid (looks like a miniature cicada). Adult psyllids emerge in spring from leaf litter to mate and laid eggs on new leaves. Nymphs feed on leave throughout summer and cause the distinctive galls on the undersides of leaves. Adults emerge in September. Most galls only cause aesthetic injury and do not kill their host. Chemical control is not recommended. Avoid destroying leaves in fall, since many beneficial wasps parasitize the nymphs and overwinter in the galls. Parasitoids are common and kill up to 50% of nipplegalls.

Hackberry nipplegall *(Photo courtesy of P. Beauzay, NDSU)*

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around the state

SOUTHWEST NORTH DAKOTA

Rainfall in southwest North Dakota has been highly variable this past week. NDAWN indicated sites at Beach, Dunn, Hazen, Mandan, Mott, and Watford City received less than an inch of rain with Beach receiving the least in the region at 0.39 inches. Bowman, Dickinson, and Hettinger sites are all over an inch of precipitation with Bowman reporting 2.27 inches for the week. Producers in the Bowman-Rhame area reported rainfall of 1.5 to 6 inches of rain in one storm last Friday with Belfield area producers reporting a little over 4 inches of rain on the same day. Erosion was reported from these storms in fields that were not seeded to a crop this year.

Producers have reported winter wheat yields in the Regent area in the 50 bushel per acre or better with test weights of 51 to 65 pounds per bushel; Lemon, SD growers are reporting 55 to 60 bushel yields with test weights of about 53 pounds per bushel and growers in the Dickinson area reporting yields of 50 to 70 bushels per acre and test weights of 55 to 60 pounds per bushel. An Oliver County producer reports that his winter wheat crop was yielding about 30 bushels per acre with scab evident. Tan spot, scab, wheat streak mosaic, barley yellow dwarf viruses, and bacterial blight appear to have played a role in reducing yields and quality. Producers are also noticing a striking difference in yields between wheat on wheat and wheat, on broadleaf crop stubble. Wheat on wheat fields are yielding 20 to 40% less than the fields where wheat followed a broadleaf crop. Winter wheat at the Dickinson Research Extension Center has been harvested. Spring wheat crop is also showing symptoms of various diseases including wheat streak mosaic virus, barley yellow dwarf virus, scab, tan spot, and bacterial blight.

Canola, oats, barley and field pea has been harvested at the Hettinger Research Extension Center. According to Eric Eriksmoen, agronomist, canola, peas and oat yielded very well while barley yields were average and test weights low. Field pea harvest on the variety trial at Dickinson has been completed and the results listed below.

The Golden Valley County Field Tour will be held at Beach this Friday, August 12 beginning at 3 pm. Contact Ashley Ueckert, Golden Valley County Agent and meet at the Fairgrounds for this tour. Another tour that maybe of interest is the Cover Crops, Coffee & Carmel Rolls tour Wednesday, August 31 at 8 am on the Ernie Holzemer Farm, Amidon. This is a great opportunity to see a variety of cover crop options being used to soak up excess water and the other great things that cover crops do for soils before heading out into the field for harvest. You can also follow the progress of this cover crop demonstration seeded July 22 on the SW ND Agronomy Notes web site http://www.ag.ndsu.edu/swagronomynotes.

Field pea trail at Dickinson Research Extension Center seeded May 6 and harvested August 3, 2011.

	Plant height	Lodging	Days to flower	Flower duration	Grain yield	Test weight	Seeds/lb
Variety	Inches	%			Bu/a	Lb/bu	Number
Agassiz	27.0	3.3	55.8	15.0	50.3	62.0	2293
CDC Golden	25.7	4.5	56.0	14.3	47.5	62.1	2341
CDC Striker	26.3	1.0	55.8	13.3	43.0	63.6	2125
Centennial	23.3	7.8	55.8	13.5	48.1	63.5	2113
Cruiser	25.3	7.3	55.3	14.8	36.1	62.9	2756
DS Admiral	26.1	3.8	56.0	14.0	45.6	64.0	2207
Majoret	25.3	1.0	56.0	13.0	45.4	63.5	2093
Meadow	26.9	4.8	55.5	14.5	44.4	63.5	2504
Patrick	25.0	7.0	56.8	13.3	45.4	63.0	2934
Treasure	27.6	4.3	55.0	14.8	49.5	64.3	2294
Mean	25.8	4.5	55.8	14.1	45.5	63.3	2366
CV%	6.1	25.9	0.7	4.3	5.4	0.7	3.7
LSD .05	2.29	1.67	0.54	0.87	3.53	0.60	126.3

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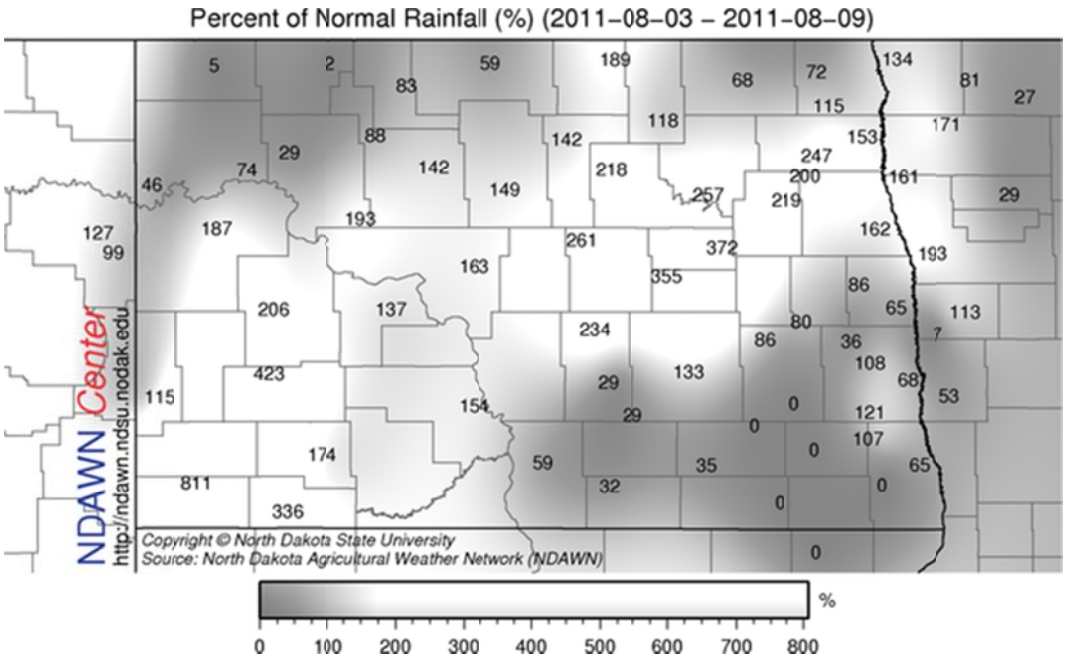
weather


Percent of Normal Rainfall (%) (2011–08–03 – 2011–08–09)
NDAWN Center
http://ndawn.ndsu.nodak.edu
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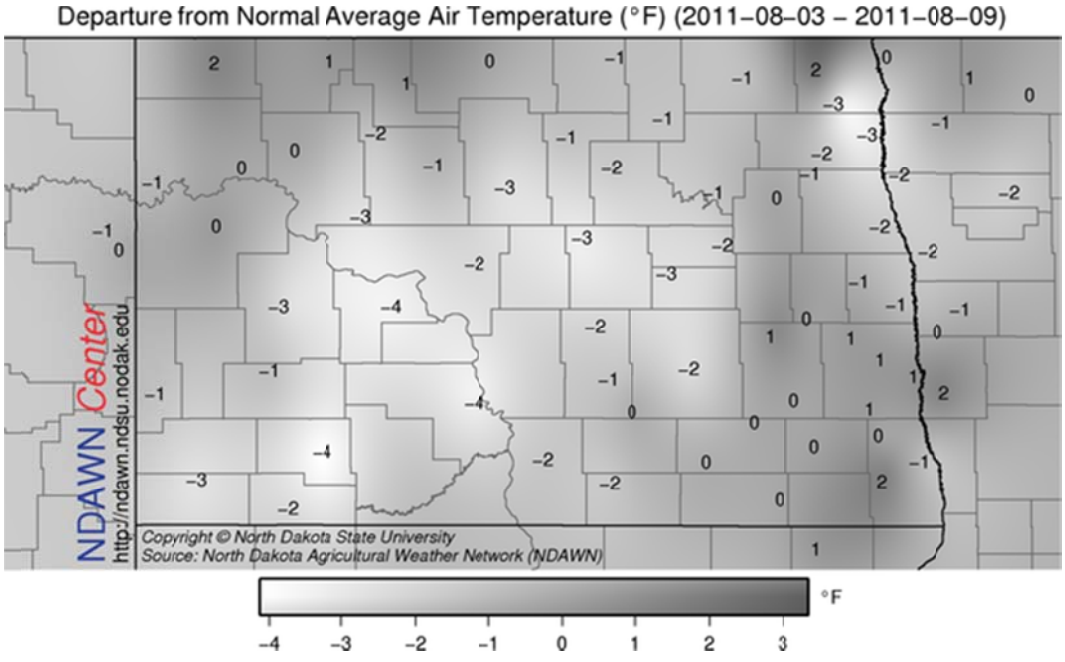
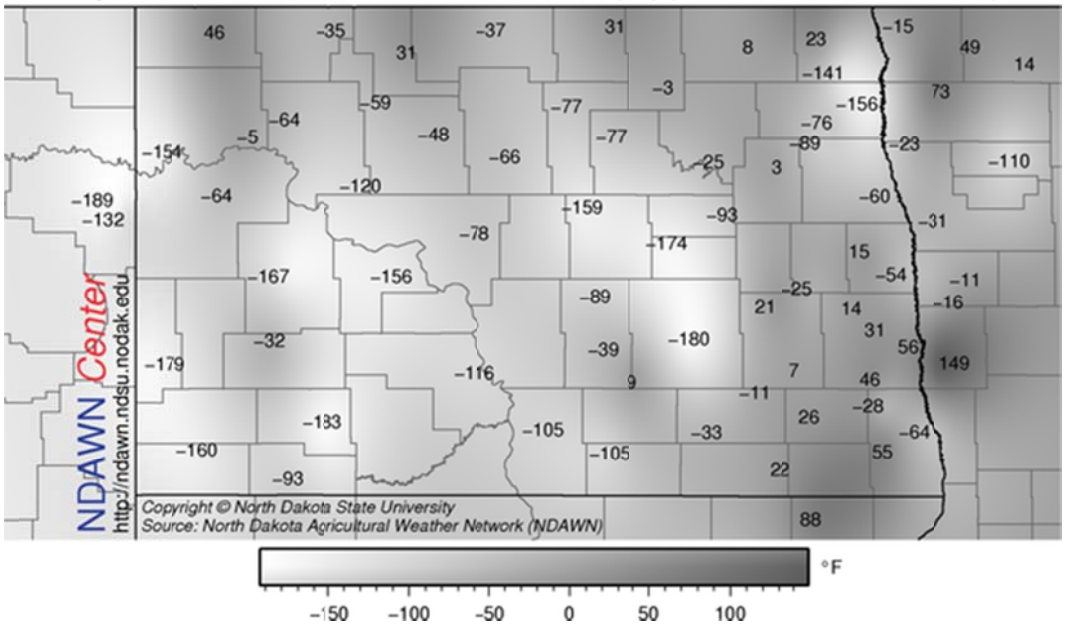
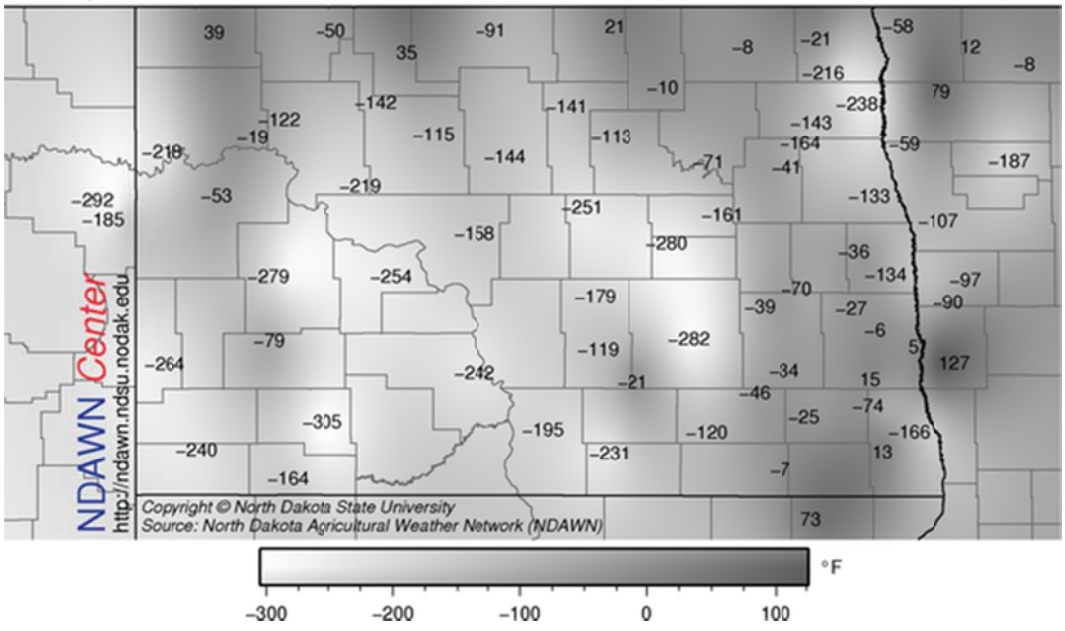
Source: North Dakota Agricultural Weather Network (NDAWN)
%
0 100 200 300 400 500 600 700 800


Departure from Normal Average Air Temperature (°F) (2011–08–03 – 2011–08–09)
NDAWN Center
http://ndawn.ndsu.nodak.edu
Copyright © North Dakota State University
Source: North Dakota Agricultural Weather Network (NDAWN)
°F
−4 −3 −2 −1 0 1 2 3

Departure from Normal Corn Accumulated GDD (°F) (2011–05–02 – 2011–08–09)



Departure from Normal Wheat Accumulated GDD (°F) (2011–04–16 – 2011–08–09)



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