

North Dakota State University Crop and Pest Report
NDSU Extension Service

No. 2, May 3, 2012

<http://www.ag.ndsu.edu/cpr/pdf-reports/3%20May%202012.pdf/view> Verified May 28, 2013

Around the State:

Southwest North Dakota

Rainfall beginning last Thursday night continued over much of southwestern North Dakota through the weekend. Rainfall totals for the weekend ranged from about 0.5 inches to nearly three inches in the Marmarth area. NDAWN location totals for southwest ND this past week ranged from 0.54 inches at Watford City to 1.62 inches at Hettinger. This rainfall pushed all NDAWN reporting locations except at Beach to above average levels for April in southwest ND. Air temperatures have been above normal so accumulated growing degree days for wheat and barley are 25% higher than normal.

Precipitation during the weekend stopped field activities until Tuesday. Herbicide and fungicide applications are being made to winter wheat in the area. Corn planting began in far western ND last Thursday and has resumed in areas where soils have sufficiently dried to support equipment. Early seeded spring wheat is at 1 ½ to 3 leaf stage of development with a few fields yet to be seeded. Russian thistle in one field scouted was about 1 ½ inches tall and field penny crest was in bloom. Alfalfa is about 5 to 8 inches tall.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop and Pest Report

NDSU Extension Service

No4, May 17, 2012

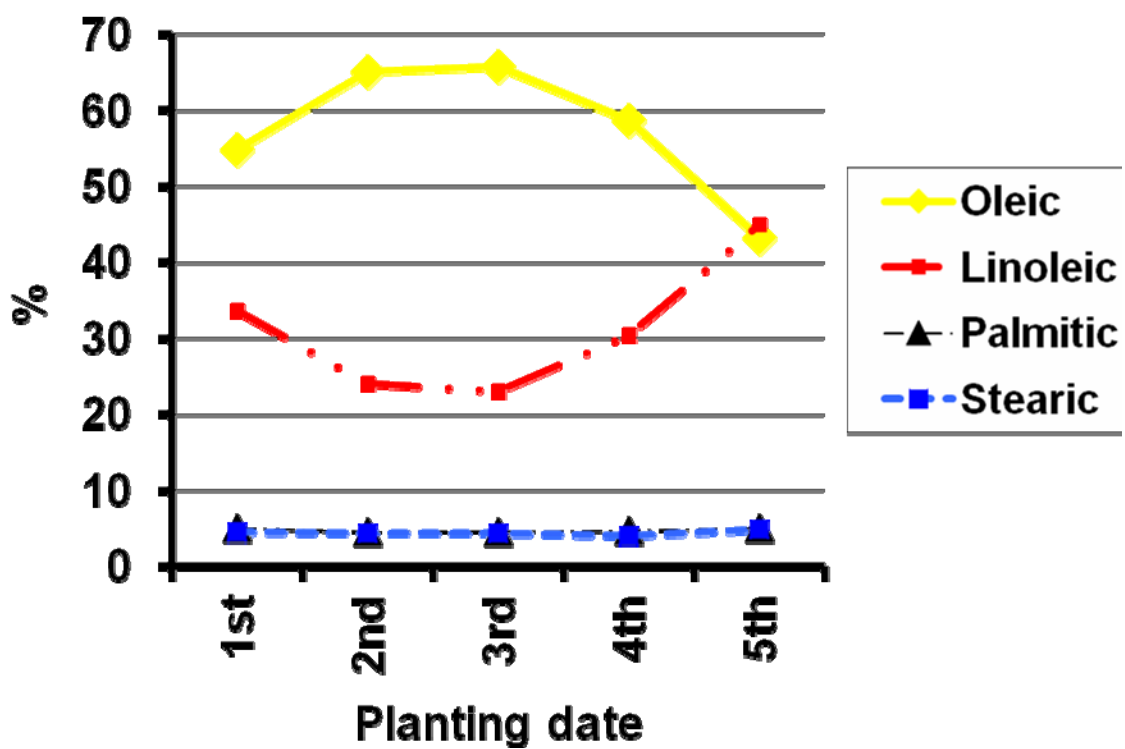
<http://www.ag.ndsu.edu/cpr/pdf-reports/17%20May%202012.pdf/view> Verified May 29, 2013

Sunflower

Sunflower Date of Planting

In the northern Great Plains, planting may extend from May 1 until late June. An open warmer winter along with a dry spring has many sunflower producers interested in seeding in early May. Growing conditions during the season will affect yield, oil content and fatty acid composition. High temperatures during seed formation have been identified as the main environmental factor affecting the ratio of linoleic and oleic acid content. Therefore, the optimum planting date will be dependent upon the variety and location, as well as weather conditions during the growing season. Variety genetics also affect oleic content, so select adapted varieties for your area. High yields may be obtained from early planting dates but yields may be reduced by increased pest problems and early season weather problems. Planting too late can result in freeze injury to immature seed and an early snow storm in the fall can bring harvest to a sudden halt. Sunflower planting date studies at Carrington Research Extension Center (<http://www.ag.ndsu.edu/procrop/sun/sunpld05.htm>) showed that planting date occurring during May 20-30 produced the highest seed yields while test weight and percent oil was greatest for sunflower seeded between May 10 and May 20. Planting date studies conducted at the North Central Research Extension Center from 1989-1993 (<http://www.ag.ndsu.edu/procrop/sun/plantn05.htm>) and Langdon Research Extension Center indicate mid-May plantings produced higher yields, test weights and percent oil when compared to early June planting dates. On-farm studies on the Miles Hansen Farm near Bowman, ND, conducted by the Dickinson and Hettinger Research Extension Centers from 1999-2001 (<http://www.ag.ndsu.edu/archive/dickinso/research/2001/agron01j.htm>) indicate the optimum time for sunflower planting is May 20-25. Sunflower yield, test weight, percent oil and oleic acid oil content were highest for the planting date falling within the planting window of May 20-25. Miller, Rehder and Vick in a 2001 study done at the North Dakota Agricultural Experiment Station, Fargo, ND (<https://www.sunflowerusa.com/uploads/research/53/53.pdf>) found oleic acid content was highest for sunflower seeded on 29 May and lowest for 18 May for two sunflower varieties in this trial. Growing Degree Day accumulation from flowering to maturity may influence oleic concentration. What is the optimum date for seeding in your neighborhood? It gets down to weather and variety but what should be evident by now is sunflowers should be in the ground by June 1.

Combined data of the fatty acid profile comparison of Mycogen 8242NS for five planting dates, Miles Hansen Farm, Bowman, ND, 1999-2001. (Ashley, Eriksmoen, Whitney, 2001.)



Planting dates: 1st planting date = 25-28 April, 2nd planting date = 9-10 May, 3rd planting date = 23-24 May, 4th planting date = 4-7 June, and 5th planting date = 14-20 June.

Roger Ashley
 Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop and Pest Report

NDSU Extension Service

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Around the State:

Southwest North Dakota

Rainfall in southwest North Dakota continues to be highly variable for the week with NDAWN reporting amounts from 0.19 inches (34% of normal) for Beach to 0.52 inches (93% of normal) at Mandan. Producers have reported from nearly an inch at New England to nothing in parts of Bowman and Golden Valley Counties. Hay fields and pasture lands reflect these below normal precipitation patterns with forage growing and low levels. Andrea Bowman, Extension Agent, Bowman County and Lane Hall, Extension Agent, Slope County report alfalfa too short to cut but beginning to bud and flower. Where precipitation was greater during the winter and through the spring, for example in Grant County, alfalfa has grown to about 16 to 18 inches, reported by Jorey Dahners, Extension Agent.

Nearly all of the corn and 75% of the sunflower has been planted in the area. Rainfall will be needed to get seed in some of the fields to germinate and emerge though where adequate amounts of previous crop residue is present in many no-till systems ample moisture is present for germination. Corn seeded during the May 1 – 8 period of time has emerged. Winter wheat in some fields is beginning to head. Early seeded spring wheat has advanced to five to six leaves. Field pea and lentils are about 5 nodes.

In some of the later planted fields now is a good time to scout to determine reasons for bare areas in the field. Producers are finding wireworms and root rots prevalent though some army cutworms were feeding earlier in some of these patches. Feeding from army cutworm has ceased and treatment time for this pest has past. Some winter wheat and spring wheat fields north of South Heart and south of Richardton have some serious issues with WSMV. It appears in the winter wheat that many of these fields were seeded early well in advance of the recommended planting window.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop & Pest Report
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Also appeared in North Dakota Climate Bulletin, Spring 2012. Volume 6, No 2. Ed Adan Akyuz and Barbara Mullins, North Dakota State Climate Office, Fargo, ND.

<http://www.ndsu.edu/ndSCO/publication/ndSCO/bulletin/spring12.pdf> Verified on May 29, 2013.

Wheat:

Freeze Injury in Wheat May Impact Management Options

Since May 11 fields in southwestern North Dakota may have experience three freeze events which may have damaged wheat growth and development. The most recent freeze occurring Friday morning, May 25 could very well have severely damaged winter wheat that was in the boot stage to early stages of flowering. NDAWN on that day recorded low temperatures of 29°F at Beach and Mott and 30°F at Bowman and Dickinson. Some producers in low lying areas reported temperatures as low as 20 to 25°F. Tonight and tomorrow night, other areas of the state could experience freezing conditions. Whether freeze injury will cause damage to the wheat crop (winter or spring) depends on several factors including plant growth stage, plant moisture content, freeze type, duration of exposure and lowest temperature reached. Determining if a wheat crop has been injured and how severely it has been injured will help the producer decide if another fungicide or nutrient application is required or if the crop should be hayed or terminated. Freezing normally does not kill the entire plant and the roots may continue to absorb nitrates from the soil. With no grain to use the nitrates, the plant may accumulate nitrate in the forage.

Susceptibility to freezing temperatures steadily increases as maturity progresses through the flowering stage then decreases slightly as seed develops. All cereals are most sensitive to freeze injury during reproductive growth, beginning at jointing and continuing through the boot, heading and pollination stages. A light freeze (28°-32°F) can severely injure cereals at these stages and greatly reduce grain yields.

Mechanical disruption of cells by ice crystals that enlarge both within and between cells will injure plants. Cereals grown under good growing conditions and high soil test nitrogen levels are more susceptible to freeze injury. Drought and other stresses tend to harden plants to cold.

The degree of injury is influenced by the duration of low temperatures as well as the lowest temperature reached. Prolonged exposure to a given temperature can cause much more severe damage than brief exposures. Topography can affect the extent of freeze injury. Also the temperature that is recorded at a particular site may not reflect the actual temperature experience by the plant in the field. These factors make it difficult to make general statements about the extent of damage caused by a freeze event. Extensive scouting of a field will help in defining severity and area affected by freezing.

A table below summarizes freeze injury symptoms and yield loss by growth stage. Diagnosis of freeze injury requires knowledge of plant parts most vulnerable at each growth stage, their location and their appearance as well as when they are normal.

Emergence to tillering – Zadoks 10-25. During seedling to early tillering stages the growing point is below the soil surface and protected from freeze injury. Most damage occurs to leaves which may have distinct light-yellow bands and which become chlorotic or necrotic and usually twisted.

Jointing – Zadoks scale 31-39. Leaves of freeze-injured plants develop damage symptoms similar to those of the tillering stage. The most serious injury can occur to the growing points. The growing point in a stem is located just above the uppermost node you can feel when you run the stem between your thumb and forefinger. To observe the growing point, split the stem lengthwise with a

sharp blade to expose the developing head. Normal uninjured growing point is bright pearl white to yellow green and turgid. Freeze injury causes the growing point to turn dull white or brownish and water soaked. Injury to growing point can occur in plants that appear to be otherwise normal because the growing point is most sensitive to cold. When the growing point is injured, stem elongation stops but later uninjured tillers continue to grow masking the damage. Expect normal and late tillers, uneven maturity and decrease in grain yield. Stem discoloration is associated with reduced metabolite transport through the nodes.

Boot – Zadoks scale 41-49. Freezing may cause heads to be trapped inside the boot so that they cannot emerge. The heads may remain in the boot, split out the side or the boot or emerge from the boot base first. Often the peduncle or stem supporting the head continues to elongate normally, causing crimps in the stem that can inhibit normal transfer of photosynthates. The result is low test weight grain. Often the head appears normal from the outside even though the anthers are dead. Because wheat (barley and oats) are self-pollinated, male sterility causes poor seed set and low grain yield. Anthers are more sensitive to freezing temperatures than female flower parts. Normal anthers are light green, full of developing pollen grains and turgid. They turn yellow when they mature and shed pollen. Freeze injury causes anthers to turn white and shrivel. It usually prevents them from shedding pollen and extruding. Anthers should be examined during this stage as leaves and stem may appear normal.

Heading – Zadoks scale 51-59. Most symptoms of freeze injury at this stage are similar to those of earlier growth stages – sterility, leaf burn and stem lesions. The most apparent symptom is chlorosis or bleaching of awn tips. White tipped awns usually indicate that floral parts have been injured. Awn tips may have a purple cast before turning white. A light-green or white freeze ring may encircle the stem below the head several days after exposure to freezing temperatures. This ring marks the juncture of the stem and flag leaf at the time of the freeze.

Anthesis – Zadoks scale 61-69. Flowering stage is most sensitive to freeze injury. Light freezes at this stage will result in the amount of injury. Usually light freezes at this stage will result in the appearance of more random damage than at other stages. More severe freezes usually cause the entire head to be sterile. Awns of damaged plants will bend to nearly 90 degree angles from the rachis as they mature.

Milk and Dough – Zadoks 71-89. Freeze injury can occur in grain during the milk and dough stages. Usually grain will grow to normal size but then produce light, shriveled grain at maturity. Cereals frozen at milk stage often shatter easily at maturity and germination percentage is usually reduced as a result of the freeze injury. Cereal kernels frozen during the dough stage will have slightly reduced test weights and appear shriveled. Seed germination may be reduced.

Spring freeze injury to cereals at various growth stages.

Growth stage	Primary symptoms	Yield effect
Tillering (Zadoks 12-25)	Leaf chlorosis, burning of leaf tips, silage odor, blue cast to fields.	Slight to moderate
Jointing Zadoks 31-39)	Death of growing point; leaf yellowing or burning; lesions splitting or bending of lower stem; odor	Moderate to severe
Boot (Zadoks 41-49)	Floret sterility, head trapped in boot, damage to lower stem, leaf discoloration, odor	Moderate to severe
Heading (Zadoks 51-59)	Floret sterility, white awns or white heads, damage to lower stem, leaf discoloration	Severe

Flowering (Zadoks 61-69)	Floret sterility, white awns or white heads, damage to lower stem, leaf discoloration	Severe
Milk (Zakoks 71-77)	White awns or white heads damage to lower stems; leaf discoloration; shrunken, roughened or discolored kernels	Moderate to severe
Dough (Zadoks 83-89)	Shriveled, discolored kernels; poor germination	Slight to moderate

Source: Paulsen, G.M., E.G. Heyne and H.D. Wilkins. 1982. Spring freeze injury to Kansas wheat. Kansas State University Cooperative Extension Service C-646.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop & Pest Report

NDSU Extension Service

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Around the State:

Southwest North Dakota

Measurable rainfall was received over parts of southwest North Dakota Monday night and during the day on Tuesday. Rainfall totals at NDAWN locations in this part of the state ranged from 0.09 inches at Bowman to 1.01 inches at Dunn Center. Producers in the Golva area indicated that they had received 2 inches of precipitation from these most recent storms. Many producers in the far southwest part of the state received little relief from the current dry conditions.

Winter wheat, field pea and some barley was harvested prior to the recent rain event. Winter wheat yields reported to date are between 30 bushel/acre to 100 bushel/acre with test weights between 57 pounds/bushel and 63 pounds/bushel. Winter wheat fields discovered earlier to have significant freeze injury have been rolled up into hay bales. Field pea yields have averaged as high as 60 bushels/acre with good test weight though seed size appears to be smaller than usual. Barley harvest is progressing in commercial fields but I haven't yield or quality information provided from these fields to date. Barley in some of the trials at Dickinson has been harvested. Yield for these plots is averaging about 70 bushel/acre but test weight is light in the low 40s. Hay harvest is nearly complete with many fields yielding less than half of a normal crop. In far southwest ND about 25% of normal.

Corn in many fields in southwest North Dakota have tasseled and silked. Moisture and heat stress prior to the most recent rain event was causing leaves to roll earlier each day. Fields located where significant rainfall occurred look much better but fields where rainfall was lacking are looking very poor. Sunflower development has progress to stage R-2 to R-5.2.

Timely rainfall will keep corn and sunflower condition from deteriorating but the remaining wheat and barley crop in the field is essentially done.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop and Pest Report

NDSU Extension Service

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Around the State:

Southwest North Dakota

Rainfall in southwest North Dakota has been highly variable over the past two weeks. Producers have reported receiving anywhere between zero to a couple of inches of precipitation. The NDAWN sites in southwest ND indicated rainfall over the past two weeks from 0.63 inches at Mandan to 2.02 inches at Dunn Center. Freeze injury from the May 25 and May 31 events continues to be reported. Corn was frozen down to ground level but is growing back with recent warm temperatures received. Some canola fields or parts of canola fields froze down and those areas of the field are dead. Winter wheat freeze damage appears to be confined to the lower areas of fields where freezing did occur. The full extent of the damage will likely be unknown until harvest. Alfalfa, grass hay fields and range units in the drier locations are very short.

As fields continue to dry out and temperatures increase wheat streak mosaic virus/high plains virus symptoms in infected plants becomes more prominent. Mites are transmitting the disease to adjacent spring wheat fields. Alfalfa weevils in alfalfa are being reported. Some growers are harvesting now while other growers who are unable to harvest at this time are applying an insecticide to reduce damage until they are able to harvest sometime in the next couple of weeks.

Though weather, disease, and insect problems continue to plague some fields the majority of the crops in southwest North Dakota continue to look good. Measurable rainfall would be appreciated over much of the area.

Roger Ashley

Area Extension Specialist/Cropping Systems

Roger.Ashley@ndsu.edu

North Dakota State University Crop & Pest Report

NDSU Extension Service

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Around the State:

Southwest North Dakota

Rainfall in southwest North Dakota has been highly variable over the past two weeks but mostly below normal. NDAWN sites in southwest ND indicated rainfall over the past two weeks from 0.06 inches (4% of normal) at Dickinson to 1.5 inches (110% of normal) at Watford City. Other NDAWN sites are reporting only about a third of normal precipitation. Bowman and Beach experienced high temperatures of 105°F and 102°F on June 26 and since then high temperatures have been in the upper 80s and lower 90s most days. Dry conditions are particularly visible in Billings, Bowman, Golden Valley, and Slope Counties. The hay crop in these counties is very short though county agents in Grant, Stark, and Hettinger Counties have reported some areas of their counties with a hay crop that is less than normal. Spring wheat and barley crops for the most part have flowered with the most advanced seen in the milk stage. Winter wheat is about two weeks from harvest with some reports of winter wheat harvest occurring just south of the North Dakota/South Dakota state line. Most producers are reporting the crop is in good to excellent condition except in the far southwest counties where the crop is stunted by dry conditions. Corn and sunflower appears to be in good conditions and advancing rapidly with warm conditions though corn is exhibiting moisture stress earlier in the day as conditions continue to remain dry and hot.

“Take-all,” a fungal disease that attacks roots, crown and the lower portion of the stem was found in a spring wheat field that was seeded on what was CRP up until it was terminated last year. The producer is likely to lose about a third of his yield to this disease and possibly more. This should serve as a reminder crop rotation is important even when the field has been in a grass/alfalfa cover for several years. Seed treatments provide only minimal control for a short period of time. Host plants for the organism that causes this disease include wheat, barley, *Agropyron* species such as quackgrass, a number of other wheat grasses as well as *Bromus* species including downy brome and smooth brome grass. Better choices of crops following CRP termination are corn, flax, canola, sunflower, and oat.

Earlier this week I visited a durum field brought to my attention by Corey Blaser, crop consultant, Bowman. This field had heads of durum with awns that were perpendicular to the head. Heads were bleached but the rest of the plant appeared healthy. The majority of these symptomatic heads were found in the low areas and side hills interspersed with healthy heads. Anthers in the affected heads were dead. No pattern could be established such as associated with a pesticide application or pesticide drift. No disease or insect feeding could be found in affected plants. In all likelihood what we were seeing in the field was the result of freeze injury resulting from a weather event that occurred a month ago. Though the crop was not headed at the time of the freeze event, sensitive parts of the plant (developing anthers) were injured and now the injury is very evident.

Though weather, disease, and insect problems continue to plague some fields the majority of the crops in southwest North Dakota continue to look good. Measurable rainfall would be appreciated over much of the area.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop & Pest Report
NDSU Extension Service
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Around the State:

Southwest North Dakota

Measurable rainfall was received over much of southwest North Dakota last Thursday night and Friday morning. Rainfall totals at NDAWN locations in this part of the state ranged from 0.32 inches at Bowman to 2.12 inches at Hettinger. Producers in the Selfridge area indicated some producers measured over 3 inches of precipitation. Most crops benefited from this timely rainfall. Crop conditions over much of the area continue to be in very good condition. One producer at Selfridge reported that he had harvested his first winter wheat last Monday. Winter wheat harvest will begin by the end of this next week or into the following week. Early seeded barley and spring wheat is beginning to turn. However, most spring wheat is in the milk to dough stages. Sunflower is progressing well with some fields in the Selfridge area in the R1 stage of development. Canola has completed flowering as well as some of the early seeded flax fields. Hay harvest continues in southwest North Dakota.

Though weather, disease, and insect problems continue to plague some fields the majority of the crops in southwest North Dakota continue to look good. This is an excellent time to examine small grain fields and variety trials for disease issues. Producers can now spot areas in the field that appear to be more advanced than other areas of the field. A closer examination in a spring wheat and winter wheat field I looked at late last week appear to have issues with fusarium crown rot. The crown of the plant and lower portion of the stem is chocolate brown. Sometimes wheat stem sawfly damage will appear somewhat like fusarium crown rot but upon dissecting the stem and crown no tunneling, frass, or larva was found. Also the on-farm variety plots in the area are showing differences in disease susceptibility. Again this is a good time to look at these trials that are located near you. Field tours which will include stops at these variety tours are listed below. Please feel free to attend.

July 16 – **Scranton Crop Tour 6 p.m. MT** – meet at the NDSU Research Plots 4 miles North of Scranton, dinner will follow. Contact Andrea Bowman, Bowman County Agent for further information.

July 17 – **Golden Valley/Wibaux Counties Crops Tour 7 a.m. MT** – meet at the Golden Valley Fairgrounds, west Beach, breakfast served at 7 a.m. Contact Ashley Ueckert, Golden Valley County Agent for further information.

July 17 – **Regent Twilight Tour 6 p.m. MT** – meet at the NDSU Research Plots on the August and Perry Kirschmann Farm located about 6 miles west of Regent, dinner to follow. Contact Duaine Marxen, Hettinger County Agent for further information.

July 17 – **Morton County Crops Tour 6 p.m. CT** – meet at the Mike Gartner Farm located west of St Anthony – Call Jackie Buckley, Morton County Agent for further information.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu

North Dakota State University Crop and Pest Report

NDSU Extension Service

No. 17, August 30, 2012

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Around the State:

Southwest North Dakota

Growers may be familiar with the winter wheat seeding dates often recommended for North Dakota. Dates printed in a number of articles recommend September 1 -15 for areas north of I-94 and September 10-30 for areas south of I-94. September 1 is certainly too early for fields in southwest North Dakota and probably the entire recommended planting date for areas north of I-94 in southwest North Dakota. Wheat streak mosaic virus (WSMV) was prevalent in many areas of southwest North Dakota and where poor sanitation followed by early seeding occurred during the period of September 1-15 in 2011 WSMV caused significant yield loss. One grower I know burned down volunteer and grassy annual weeds about August 28 and seeded winter wheat on September 2 in a field located north of I-94. Unfortunately wheat curl mites don't read and proceeded to spread WSMV throughout the field and actually several fields seeded during the period of September 1-20. Sanitation is important in preparing to seed winter wheat. There should be at least a 14 day interval between a complete kill of annual grassy weeds/volunteer plants and when the drill is pulled into the field to begin seeding. Adjacent fields with annual grassy weeds/volunteer plants should also be burned down at the same time. If the adjacent field is in corn wait to seed winter wheat until after the husks are no longer green – corn is a host for mites and WSMV. Seeding towards the end of the recommended planting window reduces the possibility of catching windblown mites from adjacent areas and reduces the chance of infecting newly emerged winter wheat with WSMV. If seeding the last week of September or later increase the seeding rate as there will be less time for tillering. Seeding into standing stubble (no-till) improves the chances for winter wheat survival. There are no effective miticides or insecticides to control the spread of mites and fungicides will not control viral diseases. Producers that have seeded early and/or have not followed sanitation procedures and have been fortunate to not experienced this disease should consider themselves lucky. WSMV is a management disease.



This field located north of I-94 was burndown on or about August 28 and then seeded to winter wheat on September 2. This field produced zero grain yield and there wasn't sufficient top growth to produce feed for cows. Growers need at least a 14 day "brown" time between burndown and seeding of winter cereals.

Roger Ashley
Area Extension Specialist/Cropping Systems
Roger.Ashley@ndsu.edu