2005

Crop Watch No. 2005-9, May 6, 2005

Lisa Brown Jasa
University of Nebraska-Lincoln, ljasa@unlnotes.unl.edu

CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

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No. 2005-9, May 6, 2005

Assessing crop damage from freezing temps

Wheat

With many areas in Nebraska experiencing freezing temperatures for several nights, wheat growers are watching their wheat crop for signs of damage.

Spring freeze injury occurs whenever low temperatures coincide with sensitive plant growth stages. Injury can cover large areas or only a few fields or parts of fields. It is more severe along river bottoms, valleys and depressions in fields where cold air settles.

The degree of injury to wheat from spring freezes is influenced by the low temperature, the duration of low temperature, and the plant growth stage. Prolonged exposure to freezing causes much more injury than brief exposure to the same temperature. Temperatures at which injury can be expected are shown in Table 1, and are for two hours of exposure to each temperature. Less injury can be expected from shorter exposures, while injury might be expected at even somewhat higher temperatures from longer exposure.

The many factors influencing freeze injury to wheat — plant growth stage, plant moisture content, and duration of exposure — make it difficult to predict the extent of injury. This is complicated further by differences in elevation and topography among wheat fields and between the fields and official weather stations. It is not unusual, for instance, for wheat growers to report markedly lower temperatures than are recorded at the nearest official weather station.

During the jointing stage, when heads are moving up the stems, it takes about two hours at 24°F to cause moderate to severe injury to wheat. Injury symptoms at this stage include: death of the growing point; leaf yellowing or burning; lesions, splitting, or bending of the lower stem; and silage odor. Stem growth stops immediately when the growing points are injured, but growth from later tillers may obscure damage. Partial injury at this stage may cause a mixture of normal tillers and late tillers and result in uneven maturity and some decrease in grain yield.

With wheat in the joint to boot stage wait several days to determine injury. With wheat that is heading to before flowering, the first visible freeze-damage symptoms occur to the anthers. They become shriveled and twisted while retaining their lime green color. This damage can be detected with a hand-held lens within 24 hours after a freeze.

Early-maturing wheat is more likely to be injured by freezes than late-maturing wheat. Susceptibility to freezing temperatures steadily increases as maturity of wheat advances during spring. Some

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Inside

Alfalfa

Recent frigid temperatures have many of us anxious about how alfalfa will be affected. Consider several factors when assessing the management options for your alfalfa: plant nutrient reserves, growing point, general plant health, forage value and of course, length and degree of freeze.

Nutrient reserves. Alfalfa roots have their lowest level of nutrient reserves when plants are 6-10 inches tall. Severe damage at this time can kill old, weak plants and slow normal recovery for healthy plants. Maintenance of green leaves can help recovery if new growth appears within about 10 days. If growth does not appear, it may be necessary to remove injured plant material to stimulate regrowth.

Growing point. The main initial source of new leaves and stems is the growing point, a.k.a. the apical meristem. It is located in the top, dense cluster of unfolded leaves at

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Early grasshopper surveys indicate increases

Nebraskans need to prepare for potentially large grasshopper populations this spring and summer, University of Nebraska entomologists say.

Although weather conditions will play a big part in this year's numbers, early grasshopper survey numbers and the continuing drought could make them worse, said Jack Campbell, entomologist at the university's West Central Research and Extension Center at North Platte.

Campbell said the U.S. Department of Agriculture's Animal and Plant Inspection Service 2004 regional rangeland grasshopper survey indicates large areas of Nebraska rangeland are at a high risk for grasshopper infestations in 2005.

Numbers in the Nebraska survey reached or exceeded 15 grasshoppers per square yard in much of the rangeland west of Highway 14 and north of the Platte River into the Panhandle counties, said Gary Hein, entomologist at the university's Panhandle Research and Extension Center at Scottsbluff. The numbers also were high in some areas of southern Lincoln, Hayes, Dundy and Chase counties.

"When the survey numbers reach 15 or more adult grasshoppers per square yard there is potential for serious grasshopper infestation the following year," Hein said.

The survey is conducted each fall in 17 western range states and indicates the potential for grasshopper densities for the spring and summer of the following year.

"This survey combined with the continued drought in western Nebraska means ranchers need to prepare for potential grasshopper problems this summer," he said. However, weather conditions at the time grasshoppers hatch this spring can reduce grasshopper numbers considerably. Cool wet conditions will cause a high mortality rate in newly hatched nymphs. In addition, good moisture during the spring and summer may allow enough grass growth to offset any grasshopper feeding damage.

"By mid to late June, all decisions and treatment options should be exercised," Hein said. "If you can treat them early, you can get better control and use lower rates of insecticides. Otherwise, we'll have adult grasshoppers that are harder to control."

For the latest information this summer about controlling grasshoppers visit the University of Nebraska-Lincoln Department of Entomology's *Grasshoppers of Nebraska* Web site at *entomology.unl.edu/grasshoppers/index.htm* or the USDA APHIS's Web site at http://www.aphis.usda.gov/

For more information about grasshopper control consult Nebraska Cooperative Extension NebFacts:

NF97-329, *A Guide to Grasshopper Control on Rangeland* (http://ianrpubs.unl.edu/insects/nf329.htm),

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Weed Science Field Days set for June

Mark your calendar for the 2005 University of Nebraska Weed Science Field Days. These events will provide a hands-on look at University research herbicide trials. While most participants are from the agricultural chemical industry, all events are free and open to the public.

Schedule

Wednesday — June 15
3:00 p.m. (MDT), Sidney, High Plains Agricultural Laboratory

Thursday— June 16
8:30 a.m. (MDT), Scottsbluff, Panhandle Research and Extension Center

Tuesday– June 21
9:00 a.m., Lincoln, Havelock Research Farm

Wednesday— June 22
9:00 a.m., Clay Center, South Central Agricultural Laboratory

Friday – July 1
1:00 p.m., Concord, Haskell Agricultural Laboratory

Brady Kappler
Weed Science Educator

CROP WATCH
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Lisa Jasa, Editor; Email: ljasa1@unl.edu

Wheat *(Continued from page 81)*

varietal difference in resistance to spring freeze injury has been reported, but it is mostly caused by differences in plant growth stages at the time of the freeze. There is little difference among wheat varieties at the same growth stage and, therefore, little opportunity to increase freezing resistance in improved varieties.

When growing conditions are favorable and there is high soil fertility, particularly nitrogen enriched soil, wheat is more sensitive to freeze injury because of its lush growth and high moisture content. Conversely, drought stress tends to harden plants to cold and decreases their water content, thus reducing the severity of freeze injury. However, ample soil moisture, cool temperatures, and high soil fertility slow plant maturity, so injury is sometimes less severe than in plants that have had less favorable growing conditions and are at a more advanced growth stages when freezing occurs.

Wheat is most sensitive to freeze injury during reproductive growth, which begins with pollination during late boot or heading stages. Temperatures that are only slightly below freezing can severely injure wheat at these stages and greatly reduce grain yields.

Fortunately, last week's cold temperatures were accompanied by rain and snow, which helped moderate temperatures within the wheat canopies. Since it is difficult to know what the air temperatures were in the wheat canopy, it is often necessary to wait five days or so after the freeze event and then assess plant damage. The growing points can be located by splitting stems lengthwise with a sharp knife. A normal, uninjured growing point is bright yellow-green and turgid; freeze injury causes it to become white or brown and water-soaked in appearance. It takes several days of warm weather for freeze injury to become apparent. Temperatures in a dense wheat canopy with moist soils are likely to cool off more slowly than surrounding air temperatures. Damage within a dense wheat canopy is likely to be less than in a thin stand of wheat.

For more information on how to assess freeze injury in winter wheat, see *Freeze Injury to Nebraska Wheat* (EC94-132), which can also be found by visiting the *Wheat Production Systems* Web site at *wheatbook.unl.edu.*

Drew Lyon, Extension Dryland Crops Specialist, Panhandle REC
Robert Klein, Cropping Systems Specialist, West Central REC

Corn

And how will seedling corn recover from this week's unseasonably cool weather and series of freeze events? Research literature which deals with one detrimental event (clipping, mowing, etc. to simulate frost) usually suggests these factors have no effect on yield. Some agronomists in northern states reportedly have seen corn recover from several frosts with no effect on yield.

Joe Lauer, Extension Corn Specialist at the University of Wisconsin is conducting a study where plants are clipped in different amounts at v2, 4, and 6. After 5-6 years of work he has observed a 5% reduction in 200 bu/acre corn with these treatments. This observed yield reduction is the result of just "one cut-off" event. Dr. Lauer's research appears to run counter to previous research (mentioned above).

Intuitively I would expect an even greater impact on yield when corn experiences multiple freeze events. Yet no research has looked at the implications this effect may have. Part of the problem lies in trying to simulate frost. I doubt if replanting would be necessary or pay off for a corn crop that has experienced multiple freeze events this year.

Roger Elmore
Extensions Crops Specialist

Table 1. Temperatures that cause injury to wheat at spring growth stages and symptoms and yield effect of spring freeze injury.

Growth stage	*App. temp (2 hrs)*	*Primary symptoms*	*Yield effect*
Tillering	12 F	Leaf chlorosis; burning of leaf tips; silage odor; blue cast to fields	Slight to Moderate
Jointing	24 F	Death of growing point; leaf yellowing or burning; lesions; splitting or bending of lower stem; odor	Moderate to severe
Boot	28 F	Floret sterility; head trapped in boot; damage to lower stem; leaf discoloration; odor	Moderate to severe
Heading	30 F	Floret sterility; white awns or white heads; damage to lower stem; leaf discoloration	Severe
Flowering	30 F	Floret sterility; white awns or white heads; damage to lower stem; leaf discoloration	Severe
Milk	28 F	White awns or white heads; damage to lower stems; leaf discoloration; shrunken, roughened, or discolored kernels	Moderate to severe
Dough	28 F	Shriveled, discolored kernels; poor germination	Slight to moderate

Alfalfa *(Continued from page 81)*

the tip of the main stem. The growing point produces hormones that discourage growth of new shoots and, to some extent, new branches. When hormone production is stopped by removal (grazing, cutting, hail) or death (freeze, disease) of the growing point, growth of that stem stops and new shoots and tillers as well as some new branching will occur.

Plant condition. Plants that went into winter weakened by harvest during the winterizing period, frequent harvests, root or crown disease, or any other factors will have more difficultly recovering from an added stress like this late freeze.

Forage value. Salvaging high dollar forage like dairy hay by harvesting immediately is easier to justify than cutting beef cow or grinding hay.

One other note: Plant response is going to be more difficult to predict this year because of the multiple frosts/freezes. This is a rare occurrence and we don't have good research or even experiential information on which to base assessments or recommendations. The factors previously listed are our primary guides.

Following are some of my best guesses in terms of proper management actions:

1. If the low temperature was above 28°F, I expect little significant impact on any alfalfa except for some singed leaf edges. Remember, though, that 28°F at the farmstead may not mean the same temperature in the field. Low spots easily could have been 3 to 5 degrees colder and for a longer time.

2. New seedlings generally tolerate cold temperatures, partly due to the heat rising from the soil and partly due to natural plant tolerance. Seedlings no older than first trifoliolate growth stage probably handle temperatures in the low 20s. As they advance in growth, cold tolerance lessens. Seedlings at 3rd or 4th trifoliolate stage can be difficult to diagnose. If leaves are just singed, they probably will recover, although recovery may be slow. Obviously, a plant that is frozen completely and bent over is probably dead. In between will depend on how much was damaged since seedlings are too young yet to regrow from crown buds and must regrow from new stem branches.

3. In well-established stands, if external parts of the canopy are the only areas showing freeze damage (wilting), the freeze may have little impact. If the growing point froze and plants are wilting below the top cluster where it's located, a significant delay in recovery is likely. During the next week, watch for:

a) new growth emerging from the tip. This means the plant is recovering nicely. Take no action.

b) new growth emerging as branches below the tip. This means the growing point was killed, slowing plant development significantly, but recovery is occurring. Your action should depend on the value of the harvestable material. Take no action if growth was less than one foot tall. If the plant was taller than a foot, but the hay will be used for stock cows or as grinding hay, take no action. If it's taller than one foot and high value (dairy or horse), consider harvesting if weather reports suggest you can complete it without rain damage.

c) new shoots emerging from crown buds. This means the growing point was killed and very little new growth can be expected from existing shoots. Cut or graze if sufficient growth is available for economical harvest before new shoots get tall enough to be damaged by the harvest. CAUTION – cutting or damaging new regrowth shoots will cause severe, sometimes even fatal, damage. Otherwise, just let the new shoots develop and expect to take the first cutting much later than normal.

d) nothing happening. If growing point cluster froze and has wilted severely, additional growth from existing plant is highly unlikely. Harvest or shred plants to encourage new shoots from the crown as quickly as possible. Or wait -- new shoots will come eventually, but slower than if existing plants are removed. If the growing point cluster appears healthy, stands straight, and remains green with little or no wilting, the plant may be stunned but should start growing again with warm temps. Take no action except to continue observation. If nothing happens after 10 days of favorable temperatures, harvest or shred.

4. Last year's late summer planting should respond much as well-established stands except recovery, especially from crown buds, is likely to be much slower due to small roots and crowns containing low levels of nutrient reserves. Consider givingplants an extra week to recover before taking any cutting, shredding, or grazing action that removes green leaves.

5. With plants (any age) frozen to ground level, well-established, healthy plants should start regrowing from new shoots emerging from the crown within seven days of favorable temperatures. Old diseased plants and last year's planting will take longer to start regrowing and some may not survive. New seedings frozen to ground level are dead -- reseed as soon as possible or plant the field to another crop.

6. Any plants damaged beyond singed leaf margins can be expected to become ready for first harvest later than usual. Plan accordingly.

Due to these freezes, be aware that plants may not bloom as they normally would so don't rely strictly on bloom to decide when to harvest. Use calendar dates or appearance of new crown shoots as a guide.

Bruce Anderson
Extension Forage Specialist

Recent storms boost Rocky Mountain snowpack

Long-term precipitation forecasts optimistic

Models indicate the current stormy pattern will likely persist through much of the summer. For the first time in five years, the long lead weather models are pointing toward a positive precipitation trend during the growing season.

As is typical for a Nebraska April, we've experienced a wide variety of weather across the state, including severe thunderstorms, heavy snow, abnormal heat, and abnormally late spring freezes. Much of the precipitation was welcome, although the wheat and alfalfa crops may have to pay a steep price.

The late April snowstorm that crossed the central Rockies gave an unusual boost to the snowpack in the northern branch of the Platte River basin. According to the Wyoming state climatologist, the upper North Platte River basin increased from 74% of normal on April 25 to 84% of normal on Monday, May 2. This compares to 60% of normal on May 2 of 2004. For the lower North Platte River basin, snowpack levels increased to 80% of normal on May 2, compared to 72% of normal on April 25, and 67% of normal on May 2, 2004.

With the aggressive upper air trough continuing across the western United States, additional snowpack increases are possible. At worst, the cool, wet conditions will dramatically slow down snowpack loss during the next few weeks. Streamflow projections will likely run between 60% and 70% of normal during the May-July runoff period. Although streamflow estimates are below normal, they are well above the rates of the past few years.

Streamflow rates also have improved within the Republican River basin, although the last two years have seen record low flows. These slight improvements are a result of above normal precipitation from October through April. Surface conditions are wetter for this time of the year than they have been in the last five years. In fact, the National Weather Service in Hastings indicated that there is an above normal chance of flooding due to heavy rainfall events.

Although streamflow rates are improving on Nebraska's two major tributaries, don't expect complete hydrological (streamflow, reservoir, groundwater) recovery this year. To more closely achieve this, conditions this summer would need to mimic last year's cool temperatures to reduce irrigation demands. If this were coupled with normal to above normal precipitation, significant recovery is a distinct possibility.

What are the chances for additional recovery? According to the short- and long-term models, the current stormy pattern will likely persist through much of the summer. Short-term models, out to 10 days, indicate the western United States trough will continue to generate waves of energy into the central Plains. Precipitation activity should increase during the period, which may lead to planting delays. Temperatures will likely be normal to below normal under the stormy conditions.

Long range weather models also are indicating a positive precipitation trend for the central Plains. If one is to have confidence in these models, it is necessary to have consistency in the forecasted output for several consecutive months. The last two model runs (March and April) have maintained persistence in the forecast for above normal precipitation for much of the state during the May-July and June-August periods. In addition, below normal temperatures are forecast for these two periods for areas north of Nebraska.

For the first time in five years, the long lead weather models are pointing toward a positive precipitation trend during the growing season. Although nothing is guaranteed, recent storm activity appears to be verifying the long range forecasts. It is unclear whether this recent wet trend may be a signal that recovery from our long-term drought has begun; however, we are seeing signs that stresses placed on the hydrological aspect of the drought are beginning to weaken.

Al Dutcher
Extension State Climatologist

Grasshoppers

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NF97-328, *A Guide to Grasshopper Control in Cropland* (http://ianrpubs.unl.edu/insects/nf328.htm) or

NF97-327, *A Guide to Grasshopper Control in Yards and Gardens* (http://ianrpubs.unl.edu/insects/nf327.htm).

These are available on-line at the addresses given or from your local Cooperative Extension office.

Sandi Alswager Karstens
IANR News Release, April 29

Preemergence corn herbicides applied postemergence

With the recent weather patterns some producers may not have gotten their fields sprayed when they would have liked to have it done. Because of this, producers often ask about applying preemergence herbicides after the corn has emerged. Several preemergence herbicides are labeled for application after emergence without injury to the crop. The table lists those herbicides along with crop stage and weed height restrictions.

If your herbicide is not listed, check the label for restrictions.

Many producers, especially those using no-till, also have been concerned that weed size may exceed the range of most preemergence herbicides by the time they are applied this year. Many of these products contain atrazine and have burndown properties. Control can be expected of 4-inch broadleaf weeds with a 1.5 lb rate and 2- to 3-inch broadleaf weeds with 0.75-1.0 lb atrazine.

The postemergence activity of atrazine can be increased by including an oil additive or applying with UAN as the carrier; however, you will not need both and adding oil to a mixture of fertilizer and atrazine will cause crop injury. If you have planted Roundup Ready corn then you can add glyphosate to the mixture. Keep in mind glyphosate activity may suffer when mixed with other herbicides or UAN so the 1 qt rate should be used.

Another option with Roundup Ready corn would be to use Field Master or Expert. Both contain a pre grass herbicide, atrazine and glyphosate as a premix. Do not use these products when using 10-34-0 or a flowable fertilizer in the tank. Use caution when using a nitrogen fertilizer as the carrier in mixtures

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Table 1. Preemergence herbicides that can be applied postemergence in corn.

Treatment	*Crop Stage*	*Weed Stage*
Aatrex/Atrazine	0-12"	1.5"[G]
Bicep II Magnum/ Cinch ATZ	0-5"	2-leaf[G&B]
Bicep II Lite Magnum/ Cinch ATZ lite	0-5"	2-leaf[G&B]
Bicep II Magnum FC	0-5"	2-leaf[G&B]
Bullet	0-5"	2-leaf[G&B]
Callisto#	0-30"	0-5"[B]
Degree	0-11"	unemerged
Degree Xtra	0-11"	2-leaf[G&B]
Dual Magnum	0-5"	unemerged
Dual II Magnum/ Cinch	0-5"	unemerged
Dual + Aatrex	0-5"	2-leaf[G&B]
Expert*, ##,###	0-12"	weeds < 6"
FieldMaster*, ###	0-11"	weeds < 6"
G-MAX Lite	0-12"	1.5" [G&B]
Guardsman Max	0-12"	1.5" [G&B]
Harness/Confidence	0-11"	unemerged
Harness Xtra/Confidence Xtra	0-11"	2-leaf[G&B]
Hornet WDG	0-20"	2-6"[B]
Keystone	0-11"	unmerged
Keystone LA	0-11"	unmerged
Lasso	0-5"	2-leaf[B]
Lasso + Atrazine	0-5"	2-leaf[G&B]
Lasso + Banvel	0-3"	2-leaf[B]
Lead Off	0-8"	1.5" [G&B]
Lightning(IMI corn)	corn < 8-leaf	weeds < 3" [G&B]
Lumax/Lexar #	0-5"	0-3" [B]
Marksman	0-8"	0-4"[B]
Me-Too-Lachlor II	0-40"	2-leaf[G]
Outlook	0-12"	unemerged
Pendimax/Prowl	0-24"	1"[G]
Prowl H_2O	0-30"	1"[G]
Prowl + Atrazine	up to 2-leaf	1" [G&B]
Stalwart C	0-40"	2 leaf[G]
Stalwart Xtra	0-5"	2-leaf[G&B]
Surpass	0-11"	unemerged
Topnotch	0-11"	unemerged
Trizmet II	0-5"	2-leaf[G&B]

Severe injury may occur if Callisto is applied postemergence to corn crops that have been treated with Counter or Lorsban. Do not tank mix with any organophosphate or carbamate insecticide. Do not cultivate within seven days of application

Do not tank mix this product with any other herbicide when applied postemergence.

Do not mix this product with complex fertilizer mixtures such as 10-34-0 or flowables. Use only water or liquid nitrogen carrier.

*Apply this product to Roundup Ready corn only

[G] Grass

[B] Broadleaf

Treat musk thistles in the rosette stage

Musk thistle (*Carduus nutans L.*) is a noxious weed common throughout much of Nebraska. When musk thistle was introduced into the United States in the early 1900s, unfortunately its natural predators from western Asia did not come with it. In 1932, the first plant was identified in Nebraska and by 1959 musk thistle was declared a noxious weed here.

The key to good control of musk thistle with herbicides is to control young plants in early May while they're in the rosette stage. Treatment after bolting is less effective because seeds may still develop. Uncontrolled plants can produce up to 20,000 seeds.

Although musk thistle is not poisonous, livestock will not graze near the plants and may refuse to enter heavily infested areas. Musk thistle is highly competitive with desirable forage species for sunlight, moisture and nutrients.

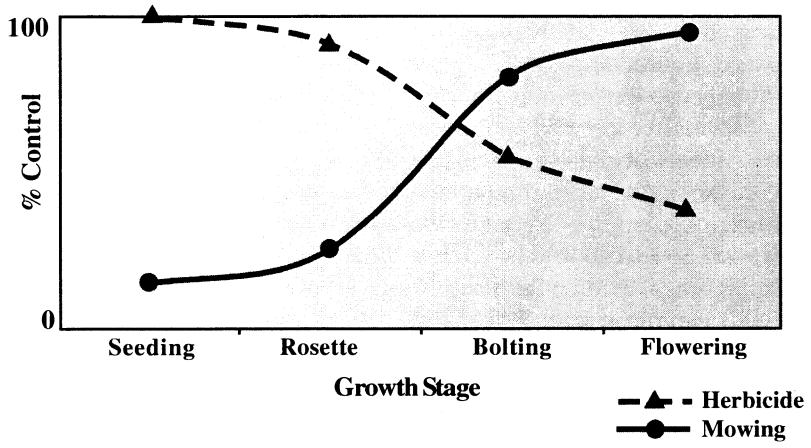

Figure 1. Musk thistle control with herbicides or mowing as affected by growth stage.

Cultural control

Good management in cultivated crops usually retards musk thistle. Fields with heavy infestations could be cropped for a few years so tillage and herbicides could reduce infestations. Good grazing management also will retard infestations in grazing land. Grasslands grazed too closely are prime candidates for musk thistle infestation. Heavy livestock use opens forage stands to musk thistle, especially in moist areas.

Mechanical control

Musk thistle can be suppressed by mowing or shredding, resulting in reduced seed production. In most stands mowing at early bloom stage is best because plants will not resprout, although younger plants may require additional control measures *(Figure 1)*. Cutting plants at the base will kill individual plants since they don't resprout from the roots. Seed may be produced by plants cut in full bloom so heads should be removed.

Biological control

In 1972, the musk thistle seed weevil, a natural musk thistle predator, was introduced into Nebraska from southern Europe. The weevil larvae feed at the base of the flower and interfere with seed production. This approach can take six to eight years before an appreciable reduction is noticed. A minimum of 500 adults should be

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Table 1. Herbicides for musk thistle control

Herbicide	*Rate/acre*	*Time of Treatment*[1]	*Notes*
Ally	0.2-0.3 oz	Late fall or spring before bolting	Use in pastures, grasses for seed, fallow and CRP. Curtail may be used in wheat.
Curtail	2 pt		
Escort	1 oz	Bolted plants in spring prior to flowering	Use in noncropland and roadsides. Add surfactant at 1 pint/100 gal.
2,4-D ester (4L)	1.5-2 qt	Late fall treatment of rosettes or in spring before flowering stalks lengthen	Annual treatments necessary for control of new seedlings. Fall applications after trees drop leaves and before leafing out in the spring reduces damage. Do not apply after "soil freeze-up" in the fall. For use on ranges and permanent pastures only.
2,4-D ester (4L) + Banvel/Clarity/ Sterling	1 qt 0.5 pt		
Tordon 22K	8-12 oz		
Grazon P+D	2-4 pt	Rosette to early bolt growth stage	
Transline	0.33-1 pt		
Redeem R&P	1.5-2.0 pt		

[1] Best control will be obtained if treatments are made when plants are actively growing. Treatments in following years may be required. Dust on leaves may interfere with herbicides.

Nutrient management for sunflowers

Because of improved prices for sunflower, acreage is expected to increase significantly this year. Sunflower is suited to dryland, limited and fully irrigated production. It is a deep rooted crop that responds well to fertilizer when nutrient levels are low and profitable production requires adequate fertility based on soil tests.

When planning for nutrient management, producers should establish a realistic yield goal for their production situation. Expected yield should be within 200 lbs of the last three-year average. For dryland conditions across Nebraska, yields can range from 500 to 1800 lbs per acre. For irrigated areas yield will range from 1800 to 3000 lbs per acre. With limited water supplies yield potential will be between the dryland and irrigated level.

Nitrogen management

Nitrogen management should be based on a realistic yield goal, soil nitrate tests to at least a three-foot depth and soil organic matter. Tabular values for sunflower nitrogen recommendations can be found in the University of Nebraska Cooperative Extension Circular 01-155, *Nutrient Management for Agronomic Crops in Nebraska.* Based on those values, an algorithm that closely follows the table is given below.

N rate = (YG*0.05) - SN -10*OM - CA.

Where:

SN is lbs of nitrate-N in a 0-2 ft sample,
YG is yield goal in lbs per acre,
OM is organic matter content
CA is a crop adjustment for legume nitrogen credit.

A recent summary of research for dryland sunflowers (Geleta, et al., Journal of Production Agriculture) shows the yields for three production levels. In most instances a nitrogen rate of 70 lbs per acre maximized yields (*Figure 1*).

Under very dry conditions no nitrogen may be required, however, with precipitation throughout much of western Nebraska approaching normal levels compared to past few years of drought, there is more optimism. Typical residual nitrate-N levels in dryland systems in western Nebraska are often near 40 lbs per acre and with organic matter levels above 1%, expected yields of 1000 lbs per acre often do not require additional nitrogen.

Regardless of whether sunflowers are produced under dryland, limited or full irrigation, nitrogen application usually decreases oil content. The oil content for the three yield classes in the Galeta et al. study is shown in *Figure 2*. Total oil production increases with nitrogen as yield increases because it is the product of oil content and total production, however, there is a penalty for excess nitrogen.

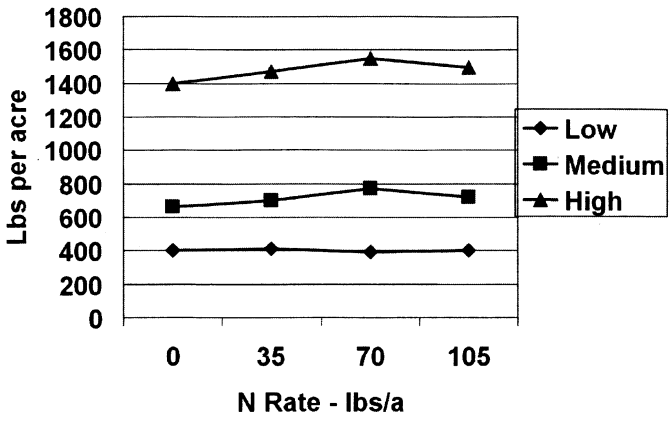


Figure 1. Effect of N rates on dryland sunflower yield. (Geleta, Baltensperger, Binford & Miller, Journal of Production Agriculture. 1997)

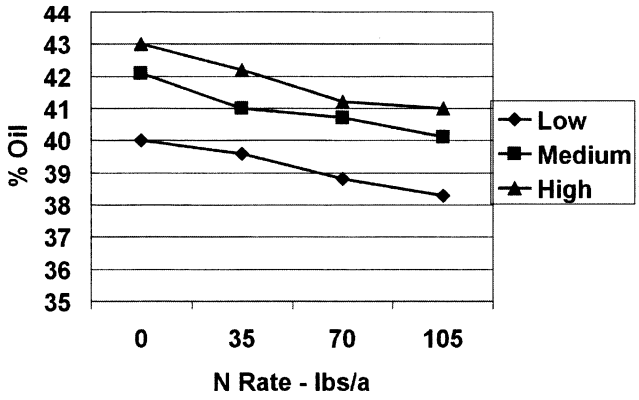


Figure 2. Effect of N rates on dryland sunflower oil content. (Geleta, Baltensperger, Binford & Miller, Journal of Production Agriculture. 1997)

There is usually a premium for oil content above 42% but there is often a penalty if it is below 40%. Current guidelines suggest that nitrogen should be broadcast early so there is time for precipitation to move it into the soil. Some nitrogen may be applied with starter fertilizer (5 -10 lbs N) but it should be banded at least 2 inches away from the seed to avoid salt damage.

Table 1. Phosphorus recommendations for sunflower.

P Soil Test - ppm		Lbs/acre P_2O_5	
Bray 1 P	Olsen P	Broadcast	Row
0-5	0-3	60	30
6-15	4-10	40	20
16-25	11-25	20	10
>25	>15	0	0

How early is early when it comes to alfalfa harvest

The first cutting of alfalfa often is the most important cutting of the year. It usually produces the most yield and its forage quality changes fastest from day to day. As fast as alfalfa has developed this spring, that quality change could be really important.

Many growers plan to cut soon after first blooms appear, but weather can cause long delays and sometimes alfalfa doesn't bloom very aggressively during spring. Plus, waiting until alfalfa begins to bloom often results in hay that is too low quality for dairy use.

You may want to consider cutting alfalfa before plants bloom or even before they form buds, but you should also be aware of the risks of this early cutting.

Being ready to cut healthy, vigorously growing alfalfa after it gets about 15 inches tall has several advantages:

1) Weather conditions may be better at that time.

2) Harvest can begin earlier, rather than waiting until all the fields are ready at the same time.

3) Some insect and disease problems can be reduced by early harvest.

4) Most importantly, feed value can be very high at this point, and the second cutting probably will be ready before summer heat lowers its forage quality.

True, yield will be lower from this early cut, although much of it will be made up in later harvests. Regrowth for second harvest probably will be a bit slower than if alfalfa had been cut at a later growth stage, especially if your alfalfa experienced winter injury this year. Allow a longer than normal recovery after either the first or the second cutting if you want to maintain long-term stands.

This year, an early first cutting may have special significance due to the many late freezes and frosts that damaged alfalfa in many areas. Removal of damaged plants will hasten the initiation of new re-growth, which may be important from both a total production perspective as well as for harvest timing later in the season. See the cover story for more information about how this week's freezing temperatures are likely to affect wheat and alfalfa.

Bruce Anderson
Extension Forage Specialist

Sunflower

(Continued from page 88)

Phosphorus

Sunflowers are often grown in rotations which include winter wheat. Many of these soils have adequate phosphorus for top production. When soils are less than 15 ppm Bray P or 10 ppm Olsen P a response is expected. Phosphorus application levels and application methods are shown in *Table 1.*

Other nutrients

Most Nebraska soils contain sufficient levels of potassium, magnesium, manganese, iron and sulfur for sunflower levels. For sunflower, if zinc levels are less than 0.5 ppm DTPA you may want to include 1 lb of zinc in row applied fertilizer or broadcast apply zinc sulfate to supply 5 lbs of actual zinc per acre.

Gary Hergert, Extension Nutrient Management and Soil Quality Specialist, Panhandle REC

Musk thistle

(Continued from page 87)

released in one area for control. For obvious reasons, this method is not compatible with mowing or spraying after plants bolt. However herbicides applied prior to musk thistle bolting are compatible with the weevil.

Chemical control

Several herbicides offer good control of musk thistle (*Table 1*). Apply herbicides when plants are in the rosette stage and prior to bolting. Control declines with herbicide application after the rosette stage (*Figure 1*).

Grazing restrictions apply to these treatments so use caution. Lactating dairy animals should not graze for one week after a 2,4-D or Banvel application and two weeks after Curtail or Tordon. Hay harvest interval for lactating dairy animals for Banvel is 37 days, 2,4-D and Curtail is 30 days and Tordon is 14 days. Neither Ally nor Stinger have grazing or haying restrictions. Follow precautions to prevent contamination of livestock and or hay.

Alex Martin
Extension Weeds Specialist

Preemergence

(Continued from page 86)

with glyphosate. Glyphosate activity may suffer when mixed with other herbicides or UAN so use at least the 1qt (or equivalent) rate. Also if you are considering adding 2,4-D to the mixture, it is best if the entire field is in at least the spike stage to avoid injury to the corn.

Additionally, please note that Balance is not registered post-emergence. If used postemergence, injury may occur. DO NOT use Balance on light sandy soils with low organic matter.

Also, crop oil (COC) can be added with some mixtures to enhance weed control, but be sure to check the label as it may cause crop injury.

Brady Kappler, Extension Weed Science Educator

May 17 Field Scout Training

Don't forget to register by May 10 to get the early discount. See more: *ardc.unl.edu/2005fieldscout.htm*

In corn and sorghum
Conditions right for seedling diseases

Seedling diseases don't usually cause widespread losses in corn and sorghum across the state and are typically in isolated areas of individual fields, but they may be more common this year. The recent rain and cool weather over much of Nebraska has created favorable conditions for the development of seedling diseases. Seedling diseases include seed rot, seedling blights, and damping-off. These are caused by fungi, bacteria, and nematodes that are either in the soil or associated with the seed prior to planting.

Many of the pathogens that cause seedling diseases occur commonly without causing disease until conditions become favorable. Plant stresses, in addition to cool and wet soil conditions, can predispose seedlings to disease. Additional stress on seedlings may result from poor seed quality, herbicide injury, insect damage, soil crusting or compaction, and misuse of fertilizers.

Stressed and diseased plants in the field may have a variety of symptoms depending on their cause. The most common symptoms are stunted and yellow tops and rotted or discolored roots. The distribution of affected plants in the field is a clue to the cause of their symptoms. Fungi cause most seedling diseases and may be associated with patches of poor stands, particularly in poorly drained areas of a field.

The most common fungi that cause seedling diseases of corn and sorghum in Nebraska are *Fusarium*, *Pythium*, and *Rhizoctonia*. Diagnosis of the cause of seedling diseases should be made carefully because the symptoms caused by the pathogens are difficult to differentiate and may impact management strategies.

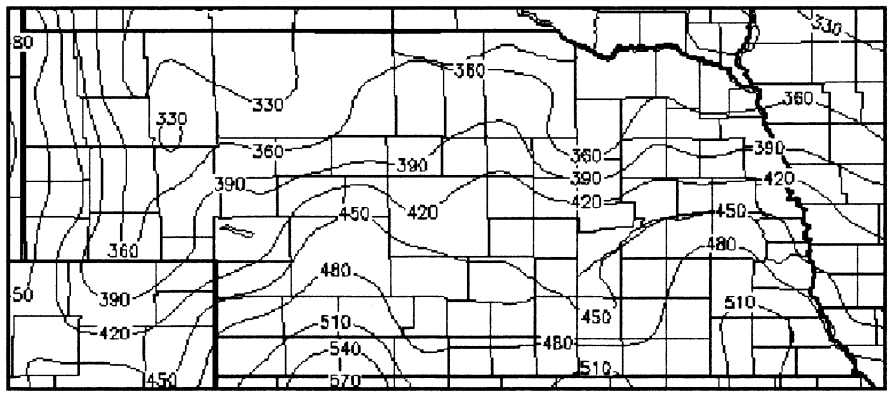
Pythium species are strongly favored by wet and cool soil conditions and can cause extensive root rot. *Fusarium* and *Rhizoctonia* also cause root rot. But, *Fusarium* is not as dependent upon particular weather conditions and may cause affected roots to vary in color between brown, black, pink, and red, depending upon the species. And, the crown and roots of corn infected with *Rhizoctonia* during cooler temperatures often develop large reddish-brown lesions.

Management

The most common management tactic for seedling diseases is the use of fungicide seed treatments. Although most seed corn is treated with one or more fungicides, these treatments only provide protection for a short time after planting. Some examples of fungicide seed treatments, such as Captan and Maxim (fludioxinil), are typically more effective against *Fusarium* and *Rhizoctonia*, whereas fungicides containing mefenoxon (Apron and ApronXL) are most effective against *Pythium*.

Post-emergence application of curative fungicides is not usually recommended for seedling disease control and there is no known resistance specifically for their pathogens. In fields with a history of seedling diseases, you may use tillage to promote drainage and root growth. You also will reduce the likelihood of developing seedling diseases in any crop by using high-quality seed and good agronomic practices.

Tamra A. Jackson
Extension Plant Pathologist



Accumulated growing degree days (GDD), using a base of 48 degrees.

Be alert for alfalfa weevil activity

Growing degree day units as of Monday, May 2, indicate that alfalfa weevil feeding should be detectable across most of the state. Egg hatch of newly laid eggs usually takes place at about 300 GDDs. First and second instars are usually present between 300 and 450 GDDs. Areas with GDDs above 350 should see feeding on the newer alfalfa leaves at the top of the plant.

First and second instar feeding damage consists of small pinholes in the leaves. Feeding by the weevil increases as the larvae molt and grow. Maximum damage will occur from about 450 to 600 GDDs. The 450 level of GDDs has already occurred in southern Nebraska. Scouting for weevil feeding should be underway in all counties. *(Map developed by Al Dutcher, Extension State Meteorologist)*