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CROP WATCH

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Pest problems developing in Panhandle wheat

Recent moisture across most of western Nebraska has given wheat growers some optimism for the current wheat crop; however, concerns about last week's extreme cold temperatures are tempering this some. Also, recent reports and observations indicate potentially serious issues are developing in Panhandle wheat.

First, there have been several reports of "yellow wheat" that appears to be wheat streak mosaic, plus the Russian wheat aphid is widespread and some economic infestations have been observed. (See *page 100* for additional issues facing wheat in western Nebraska.)

With this spring's intermittent warm weather, wheat streak mosaic virus is developing in a number of winter wheat fields in the Panhandle, including in northern Cheyenne County and southeast Cheyenne County east into Duel and southern Garden counties. Last June several hail storms passed through these areas, resulting in pre-harvest volunteer wheat that served as oversummering sites for the wheat curl mite and wheat streak mosaic virus. In the fall, the mites transmitted the virus to the current winter wheat crop. The virus increases in plants through the fall, but the plants often remain symptomless until it warms up in the spring. This warm weather – especially days of more than 80°F – enables the virus to replicate in the plant and create the severe symptoms common to wheat streak mosaic.

Symptoms may not be dramatic early in the spring; plants may just look slightly yellow and appear unthrifty. These symptoms may resemble cool temperature stress, low fertility or some other cereal disease. With warm spring temperatures, often the plants will outgrow these symptoms, especially if adequate moisture is present. However, if wheat streak is present, the plants will continue to decline with the warm weather. The yellowing of the plants gets considerably more severe, and the plants may begin to spraddle (grow more horizontal to the ground rather than vertical). Wheat streak infected leaves show a yellow mosaic pattern of parallel discontinuous streaks. These mosaic symptoms are best seen on the youngest leaf. Older leaves take on more extensive

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Inside

Assessing crop injury, effects

Thunderstorms spewing hail, rains and high winds moved through the state Tuesday and Wednesday, leaving some fields flooded in areas of central and eastern Nebraska. In west central and western Nebraska, where crops had sustained the brunt of several recent deep freezes the week before, plants were just starting to recover with the recent warmer days.

The Nebraska Agricultural Statistics Service (NASS) estimated Sunday (May 8) that 74% of the state's corn and 15% of the state's soybean crop had been planted, with about 10% of the corn having emerged. That compares to an average emergence by this date of 19% for corn. NASS estimated that at least 75% of the state's wheat had jointed, slightly ahead of average at 59%.

Further information on this topic will be posted to the *CropWatch* Web site at *cropwatch.unl.edu*

While some fields in the Hall County area were completely submerged, historically fields here have drained in one to two days and plants may recover well if they don't receive another downpour, reported Jim Hruskoci, Extension Educator in Hall County.

Other areas of south central Nebraska sustained hail damage although it's too early to fully assess the extent of crop damage.

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Ag briefs

Gary Lesoing, Extension Educator in Nemaha County: I don't believe there was major damage to corn, alfalfa and wheat in the area due to the recent series of frosts. Most of the corn had not emerged due to the cold temperatures and I don't think wheat was far enough along in development to cause major damage.

The alfalfa may have been stunned by the cold, but should recover. There were good field conditions last week for farmers to really make significant progress in planting crops. Producers are generally winding down on corn planting and many are planting soybeans. Some of the corn has been in the ground for two to three weeks which has caused some concern, but the warm temperatures late last week and early this week should help corn and soybean emergence.

Karen DeBoer, Extension Educator in Cheyenne County: Recent cool weather slowed wheat growth. At the start of the week, winter wheat leaf tips were brown in some fields. We should be able to determine the full extent of frost damage after four to five days of warm weather.

We have found wheat curl mites, the vector for wheat streak mosaic virus and High Plains virus, in wheat fields in northwest Cheyenne County.

Delroy Hemsath, Extension Educator in Dakota and Dixon counties: Most of the corn in northeast Nebraska has been planted and soybeans are being planted as the soil dries out. The frosted alfalfa is recovering. I have only seen one field that was cut in order to stimulate regrowth. There has been an abundance of shepardspurse and mustards in the fields, most of which has been sprayed with herbicides.

Dewey Lienemann, Extension Educator in Clay and Webster counties: We have not had rain in three weeks and the fields are hard and dry. Pivots are running in a lot of fields to soften the crust and get the corn and beans up. Some wheat fields I toured this morning had scorched leaves from the frost, but otherwise look good and are showing their flag leaf (Feekes 8). Other fields are not yet at that stage and seem to be deteriorating in condition.

In Webster County, southern Adams and eastern Franklin counties wheat condition is varied. We have a lot of yellow wheat fields that I believe are mostly related to environmental conditions. We endured five straight nights of freezing temperature and in some areas it got down as low as 25°F. Patches of a field may be brown (mostly low areas) while other areas of the same field look good. It is difficult to determine accumulative damage because of the cool weather and lack of growing days.

I have heard word of some fungus diseases coming in to our area mostly because of the weather conditions. These include: septoria, powdery mildew, and tan spot. Some fields on flatter ground are in excellent condition.

We are experiencing similar problems in alfalfa. We had some freeze damage of leaves but I couldn't find any affected growing points. Up until last week the alfalfa looked really good. Our biggest problem right now is alfalfa weevil -- some fields are lousy with them. Ironically some fields were sprayed for weevil just before the frost so cutting the freeze-damaged alfalfa was not an option. Some farmers that hadn't sprayed are clipping the frost damaged alfalfa to control the weevils. In both wheat and alfalfa fields we are finding more weeds than usual.

Gary Zoubek, Extension Educator in York County: We've had good rains in April, but we're getting dry and have had considerable crusting in fields planted prior to the heavy rains. Planting has progressed rapidly with most of the corn in and many producers nearing the end on soybeans.

Steve Melvin, Extension Educator in Frontier County: Wheat here should outgrow the freeze damage to leaves. Alfalfa also suffered freeze damage. Some producers are harvesting it, while others are waiting to see if it continues growing. Most of the corn is planted and some is emerging. Soybean planting is just getting started.

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Crop injury *(Continued from page 91)*

Assessing flood damage

The severity of damage from flooding and ponding will depend on the depth of the flooding, the length of time an area was flooded and the temperature of the flood water. Depth of flooding refers not only to the water visible above ground, but also to the level of moisture in the soil profile.

Early spring flooding is a lot less harmful than late spring flooding when the flood waters are apt to be warm. Even if flooding doesn't kill plants outright, it may have a long-term negative impact on crop performance and the potential for disease development.

Freeze damage update

Ten days after much of Nebraska sustained a series of freezing temperatures, it appears the damage to the state's winter wheat crop may not have been as deadly as first feared. The state's sugarbeet crop, however, did not fare as well. About half of the contracted sugar beet acres in Nebraska will need to be replanted.

This week USDA's Nebraska Agricultural Statistics Service reported that wheat conditions rated 1% very poor, 4% poor, 34% fair, 48% good, and 13% excellent. Fields were 75% jointed, behind last year at 78% but ahead of the average at 59%. Alfalfa conditions continued to decline due to the impact of the freezing temperatures and rated 7% very poor, 12% poor, 37% fair, 37% good, and 7% excellent.

Reports from Extension specialists and educators provide some insight into how crops have fared.

Drew Lyon, Extension Dryland Crops Specialist at the Panhandle REC in Scottsbluff: Late last week I surveyed winter wheat fields in Box Butte County, which had some of the coldest recorded temperatures (13°F) May 2. I saw symptoms of cold damage — burnt leaf tips, purple culms and leaves, and a few split stems — but few signs that the heads were injured. This means that the wheat here has probably escaped serious injury and the loss of significant grain yield despite the very cold temperatures.

Kent Been, Extension Educator in Red Willow County in west central Nebraska: He found similar damage as that in the Panhandle, and few injured heads. The damage to the lower portion of the stem, however, is particularly concerning because the rest of the tiller is still green but will dry out if water can't move up through the plant when we have warmer days. The stem likely will lay down and not produce.

Bob Klein, Extension cropping systems specialist at the West Central REC: While we found leaves that were frosted and burned back, the head and awns appear to be light green, which is normal. In a few cases the awns were white, which indicates potential injury. We won't be able to determine the full extent of injury until we can see kernel development.

In the west central area, lack of soil moisture is creating greater

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Wheat pests *(Continued from page 91)*

yellowing. Another obvious symptom is the tight curling of the edge of the leaf that is caused by wheat curl mite feeding. These tight curls are indicative of mite presence and ultimately virus infection.

Plants infected with wheat streak will not recover in the spring and likely will only get worse as temperatures become consistently warmer. Mild infections in fields may show an obvious effect at the edge closest to the mite source, but severe infections will extend across the field. In areas where extensive preharvest volunteer wheat was present in the fall, the source of mites may be difficult to identify since it may be from further away than the neighboring field.

Fields severely infected with wheat streak can have very low yield potential but the fields cannot be released for insurance until the symptoms develop into the obvious stages. In severely infected fields, management options include grazing the wheat or planting the field to a summer crop. However, by the time the wheat has been released for insurance the wheat will have used most of the soil moisture that would support a summer crop. The final impact of wheat streak on yield will be determined by the seriousness of the infection and the weather conditions through the rest of the season.

The Russian wheat aphid also is widespread in Panhandle wheat fields this year. It can be found in nearly all fields, but most fields are infested at levels well below economic thresholds. However, some fields in Banner County are at or above the thresholds. Leaf purpling is very common because of the cold weather, but if aphids are present, the uppermost leaves of the plant will have considerable yellow or white striping. Threshold levels for the Russian wheat aphid range from about 5% to 25% infested tillers with lower thresholds for wheat with high yield potential and higher thresholds for wheat with lower yield potential. The most critical time for control of the Russian wheat aphid is just before the flag leaf is emerging. Treatments should eliminate aphids so the flag leaf emerges normally and the heads will not become trapped in the curled flag leaf. Serious aphid infestations during the heading stages seem to only occur when rainfall is limited. Further information on scouting and thresholds for the Russian wheat aphid are available on the High Plains Integrated Pest Management Web site at *highplainsipm.org*.

Gary L. Hein
Panhandle REC, Scottsbluff

In winter wheat

Treatment criteria and profitability of fungicides

Leaf rust, stripe rust, powdery mildew, tan spot and Septoria leaf blotch comprise the primary foliar diseases in the central Great Plains.

Powdery mildew is currently active in many wheat fields in southeast Nebraska and this week leaf rust was identified in south central Nebraska. Stripe rust and leaf rust have been reported to be developing rapidly in Kansas and Oklahoma. These diseases are most damaging when severity on the upper leaves reaches a high level by mid-June. This causes early loss of these leaves, which shortens the grain filling period and results in reduced yields and lower test weights.

Statewide, foliar diseases reduce yields about 1%, but in the last four years stripe rust has reduced yields on susceptible varieties as much as 30%. When May and June temperatures are moderate and precipitation is at or above normal, these diseases, particularly stripe rust, pose an even greater threat.

Overcast humid weather promotes the development of powdery mildew which is already on the middle leaves and will continue to move upward onto the flag-1 leaf if current weather conditions prevail. If temperatures remain moderate, however, and key rains occur during grain fill, wheat may still produce acceptable yields, despite moderate disease pressure. Certain products such as Stratego, Tilt, and Quilt have to be applied at flag leaf emergence (Feekes 8 stage) to comply with the labels. Other products such as Headline and Quadris can be applied up to late head emergence (Feekes 10.5).

Treatment criteria

How likely are you to have significant damage from foliar diseases? Intensively managed irrigated wheat is at greatest risk because the moisture necessary for infection is often supplied by the irrigation. The greatest risk for having a tan spot or Septoria leaf blotch problem is drilling wheat into or next to standing wheat stubble.

Monitoring the rust situation in the southern Great Plains and the local powdery mildew and leaf spot situation beginning in early May and continuing into late May or early June gives a good indication of the potential for foliar diseases to become a significant production factor in an individual field. Use the following criteria when determining whether to treat:

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Table 1. The potential net profit of foliar fungicide treatment of wheat.

Yield in bushels per acre	Potential loss in:		$ loss based on a wheat price of:		Net profit ($) at a $15 treatment cost based on a wheat price of:		Net profit ($) at a $18 treatment cost based on a wheat price of:	
	%	bu/a	$3.00	$3.50	$3.00	$3.50	$3.00	$3.50
45	5	2.25	6.75	7.9	-8.25	-7.1	-11.25	-10.1
45	10	4.5	13.5	15.75	-1.5	+0.75	- 4.5	- 2.25
45	20	4.5	27.0	31.5	+12.0	+16.5	+9.0	+13.5
45	30	9.0	40.5	47.25	+25.5	+32.25	+22.5	+29.25
60	5	3.0	9.0	10.5	-6.0	-4.5	- 9.0	- 7.5
60	10	6.0	18.0	21.0	+3.0	+60	0	+3.0
60	20	12.0	36.0	42.0	+21.0	+27.0	+18.0	+24.0
60	30	18.0	54.0	63.0	+39.0	+48.0	+36.0	+45.0
75	5	3.75	11.25	13.13	-3.75	-1.7	- 6.75	-4.7
75	10	7.5	22.5	26.25	+11.25	+11.25	+4.5	+8.25
75	20	15.0	45.0	52.5	+30	+48.75	+31.5	+42.75
75	30	22.5	67.5	78.75	+52.5	+63.5	+49.5	+60.75
90	5	4.5	13.5	16.8	-1.5	+0.75	- 4.5	- 2.3
90	10	9.0	27.0	31.0	+12.0	+16.5	+9.0	+13.5
90	20	18.0	54.0	63.0	+39.0	+48.0	+36.0	+45.0
90	30	27.0	81.0	94.5	+66.0	+79.5	+63.0	+76.5

[1] The net profit does not reflect the government subsidies for wheat as outlined in the farm bill.

Fungicides *(Continued from page 94)*

Variety planted: What is the variety's level of resistance to rust diseases? Varieties that are moderately resistant or resistant to stripe and leaf rusts may not need to be treated, *unless* race changes occur in the rust population forming new races capable of overcoming plant resistance. However, those that are moderately susceptible or susceptible to one or both of the rusts need to be watched closely. Some of the more popular varieties such as Jagalene and Jagger, listed as resistant to leaf and stripe rusts, are showing higher rust severity levels this year than in past years and may need to be treated to protect yield potential.

Stand quality: In April assess the quality of the stand coming out of dormancy. Dryland wheat should have a yield potential of 40-50 bu/ac, and irrigated wheat should have a yield potential of 75-85 bu/ac to justify treatment.

Rust buildup in the southern plains: If either or both stripe or leaf rust are developing rapidly in Texas and Oklahoma during April and in Kansas during May, the probability is high that Nebraska will have a rust problem. Rust levels are already building rapidly in those states.

Earliness or lateness of the crop: If cool weather slows maturity, the window for disease development is extended and the impact on the crop is greater than if the crop is maturing early.

Weather conditions: These diseases need moist conditions, so if the long range forecast for May and June predicts above average rainfall, the disease risk is higher. Dry conditions lessen the threat to dryland wheat but may increase it for irrigated wheat because of more frequent irrigation. So far the weather in May has been perfect for rusts and powdery mildew.

Estimated price of wheat: If wheat is selling for $3.50/bu or above, treatment is more appealing than if the price is below $3.00/bu.

In general, if trace amounts of rust, powdery mildew or leaf spot are present on the flag-1 and flag-2 leaves by Feekes stage 9 (flag leaf fully expanded) and infection below the flag leaf is moderate to moderately severe, the likelihood is high that this disease will become severe enough on the flag leaf to affect yields and applying a fungicide should be cost effective.

Profitability of treatment

Applying a foliar fungicide to wheat does not guarantee higher yields. Consider it equivalent to health or home insurance. You pay a premium for protection that you may not need. If you get seriously ill or your house is severely damaged, the premiums were worth the cost, but if you don't file any claims or the claims are small, you will have paid out more in premiums that you received from claims. This same principle applies to treating wheat.

In the event of serious disease pressure, timely application with the right product will protect yields, thus the investment was worth the cost. But if you treat the field and the disease levels never develop beyond light or moderate, the return on your investment will be less favorable and could be just a break even or even a loss situation.

The cost of treatment will range from $15 to $19 per acre depending on the product used and method of application. Many producers growing wheat under irrigation for maximum yield or for seed feel this investment is justified. However, the justification for treatment under a dryland cropping system is not as clear cut, and using the criteria provided becomes much more critical in making that decision.

Table 1 illustrates the potential net profit of treating wheat if various yield losses were to occur. *In general when losses are greater than 10%, treatment with a foliar fungicide would have been cost effective.* The potential net profit illustrated in *Table 1* relates to common sale prices of wheat. Farmers also need to consider the effect on LDP payments and crop insurance coverage and indirectly to farm program and counter-cyclical payments which may make treatment a more favorable option.

John Watkins
Extension Plant Pathologist

Correction: Weed Science Field Days

The following calendar for the 2005 University of Nebraska Weed Science Field Days includes several changes from the calendar published in the May 6 *CropWatch.* These field days 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

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

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

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

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

July 6, Wednesday, 8:00 a.m., North Platte, West Central Research and Extension

July 19, Tuesday, 1:00 p.m., Concord, Haskell Agricultural Laboratory

Controlling problem weeds in Roundup Ready soybean

Many farmers are reporting that glyphosate used alone does not work as well today as it did five or six years ago. Nebraska's fields appear to be experiencing a slow shift in weed species.

In the last three years, university extension weed specialists have been receiving phone calls and complaints on glyphosate failing to control certain weed species, including some "new weeds." The list of such species includes: marestail (horseweed), morningglory (common and ivyleaf), wild buckwheat, Pennsylvania smartweed, lady's thumb, Venice mallow, yellow sweetclover, field bindweed, waterhemp, kochia, Russian thistle, primrose species and volunteer Roundup Ready corn.

If these weeds are not controlled, their seeds will become a major problem, especially in no-till systems where tillage is not used for weed control. Such shifts to more tolerant weeds is already resulting in increased weed control costs due to additional herbicide applications or increased glyphosate rates.

This article summarizes preliminary data from studies conducted in 2004 at the University's Haskell Ag Lab near Concord and the West Central Research and Extension Center at North Platte. The research tested six soil-applied herbicides for control of the previously named weed species. The six broadleaf herbicides were: Authority 75DG (5oz/acre), Sencor 75DF (8 oz/acre), Canopy XL 56DG (6.5oz/acre), Commit 3ME (1.5pt/acre), Pursuit Plus 2.9EC (2.5pt/acre), Scepter 70DG (2.8oz/acre) and Steel 2.6 EC (3pt/acre). These herbicides were applied to the soil after planting weed seeds.

The level of weed control at 40 days after planting varied by the weed species and herbicide. For example, Sencor provided excellent control (100%) of kochia, velveltleaf and Venice mallow, compared to a lower control level (37%) of ivy leaf morningglory (*Table 1*). For control levels for each weed species and herbicide see *Table 1.*

The results indicate a potential to effectively control most of these weed species with various pre-emergence herbicides applied to the soil after soybean planting. Soil-applied herbicides also would provide an additional mode of action for weed control, reducing the likelihood of developing weed resistance. Soil-applied herbicides also would provide a longer "comfort zone" for weed control early in the season by delaying the critical time for weed removal and reducing the need for multiple glyphosate applications later in the season.

Using various weed control tools is not a new thing -- we only "forgot" about it since the introduction of Roundup Ready crops. Rotating herbicide modes of actions is a basic tenet of an Integrated Weed Management (IWM) program where several weed control tools are integrated to provide weed management. Integrated systems are especially important when combating weed resistance/tolerance issues. Roundup Ready technology can fit under the umbrella of an IWM system but it will need to be preserved through proper management and reduced overuse.

In essence, the development of an IWM program is based on a few general rules that can be used on any farm. These include:

1) use of agronomic practices that limit the introduction and

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Table 1. Weed species and percent control with various pre-emergence herbicides at 40 days after application at the Haskell Ag Lab near Concord in 2004 (preliminary data).

	Herbicide and rate						
Weed species	*Authority 5 oz/ac*	*Sencor 75DF 8 oz /ac*	*Canopy XL 6.5 oz /ac*	*Commit 1.5 pt/ac*	*Pursuit Plus 2.5 pt /ac*	*Scepter 2.8 oz /ac*	*Steel 3 pt/ac*
Field bindweed	77	63	100	73	98	98	97
Ivyleaf morningglory	88	37	90	40	72	83	85
Kochia	100	100	100	100	100	98	100
Russian thistle	100	95	100	37	95	98	98
Yellow sweetclover	67	98	93	98	81	90	86
Velvetleaf	98	100	95	100	100	90	97
Venice mallow	92	100	100	100	97	98	97
Common waterhemp	100	100	100	96	100	95	100
Wild buckwheat	100	100	100	100	100	100	100
Lambsquarter	100	100	100	100	100	100	100
Roundup Ready corn	12	27	71	33	55	96	95

Target weeds in sorghum early in the season

Grain sorghum planted in mid-May grows slowly for the first two to three weeks in contrast to corn and soybean. Many early season weeds including lambsquarters, Pennsylvania smartweed, common sunflower, velvetleaf and even foxtail grow faster than sorghum. For this reason early sorghum is less competitive with weeds than corn and soybean, emphasizing the need for early weed control.

Effective weed control for the first 30 days will give sorghum a head start on weeds and pay big dividends in sorghum yields. Fortunately there are several effective preemergence herbicides registered for use in sorghum. It is important to target annual grass weeds with a preemergence treatment as post-emergence options are limited.

Essentially all sorghum seed is now treated with a safener required for use of most preemergence herbicides. Atrazine (the only one of the group not requiring safened seed) provides fair control of many annual grasses and good control of broadleaf weeds. Bicep II Magnum, Bicep Lite II Magnum, Bullet, G-Max Lite, and Guardsman Max provide control of annual grasses and broadleaf weeds.

Large seeded broadleaf weeds including sunflower, cocklebur, velvetleaf and morningglory are often not adequately controlled with preemergence treatments. A postemergence treatment may be required to control these weeds. Dual II Magnum and Outlook control annual grasses and small seeded broadleaves. Application rates of these herbicides vary with soil properties. Check the product label or the *University of Nebraska - Lincoln Cooperative Extension 2005 Guide for Weed Management in Nebraska* (EC 130) for details.

Postemergence treatments that provide broadleaf weed control include atrazine, Aim, Ally + 2,4-D, Marksman/Sterling Plus, Banvel/Clarity, 2,4-D, Buctril&Atrazine, Peak and Permit. Many of these herbicides can be combined to broaden the spectrum of weeds controlled. Starane is an herbicide recently registered for use in grain sorghum. Starane contols many broadleaf weeds including kochia and triazine-resistant and ALS-resistant biotypes.

Paramount and Paramount plus atrazine provide postemergence grass control, especially of green foxtail, and broadleaf weed control.

Herbicide application rate, sorghum and weed growth stage, and spray additives are all important in attaining maximum performance of postemergence herbicides. Consult product labels or *EC 130* for details.

Alex Martin
Extension Weeds Specialist

New soybean rust publications

Two new University of Nebraska Cooperative Extension publications will help soybean producers learn more about soybean rust and its control.

The publications are *Soybean Rust: How Great is the Threat for Nebraska?*, NebFact NF05-633, and *Fungicides to Manage Soybean Rust: What are the Product Differences?*, which is NebFact NF05-634.

Both are available from local Extension offices or online at *ianrpubs.unl.edu/plantdisease/nf633.htm* and *ianrpubs.unl.edu/plantdisease/nf634.htm.*

Problem weeds

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spread of weeds (preventing weed problems before they start),

2) use of practices that help the crop compete with weeds , and

3) use of practices that do not allow weeds to adapt.

Combining agronomic practices based on these rules will allow agronomists to design an IWM program for any field. The bottom line is that an IWM program is not a one-size-fits-all solution. Rather, it needs to be changed and tailored to a particular farming operation. Since the eradication of weeds isn't possible, the goal is to manage weeds.

For more details on integrated weed management see the University of Nebraska Extension Circular, *Guide for Weed Management in Nebraska (EC130)*. The concepts of IWM become even more important when other Roundup Ready crops become more readily available (e.g. Roundup Ready corn, Roundup Ready alfalfa).

It is easy to fall into a trap of overusing glyphosate when one glyphosate-tolerant crop is grown after another. Proper use of this technology as part of an integrated weed management program, is the key to preserving the long-term benefits of this technology while avoiding many of the concerns about its use or overuse.

Watch future issues of *CropWatch* for two more parts to this story: glyphosate pre-mixes and glyphosate rates needed to control problem weeds in Roundup Ready soybean.

Stevan Knezevic
Extension Weeds Specialist
Haskell Ag Lab, NEREC

Managing sunflower diseases

Nebraska sunflower growers are unaccustomed to experiencing yield losses due to diseases. This is because traditionally more acreage has been planted to dryland than to irrigated production, and those conditions tend to be less favorable for disease development. This year, however, due to an increasing demand for oils and other sunflower products, a 170% increase in acres planted to sunflowers is expected. Estimates are that 95,000 acres will be planted in 2005, compared to 56,000 acres in 2004.

More of this production will be irrigated than in previous years, thus environmental conditions will be more conducive for disease. It is important that farmers be aware of this increased potential for diseases and be prepared to recognize and treat them when found.

Dryland diseases usually have been limited to several root and stalk rots, caused by the soilborne fungal pathogens *Phoma*, *Phomopsis*, and *Macrophomina*. These organisms are considered to be weak pathogens that opportunistically infect plants that are undergoing stress. These diseases likely will not be observed in irrigated production. If they are present, little can be done to combat them. The best method of dealing with these types of disease would be to avoid stress where possible and plant cultivars with higher levels of resistance (stalk strength). Burial of infected residue also will help promote decomposition and reduce pathogen populations in the soil.

Moderate temperatures and high levels of moisture generally will contribute to higher disease incidence. Some of the more common and important diseases favored by these conditions include white mold and rust. White mold, caused by the fungus *Sclerotinia*, overwinters and survives in soils as sclerotia. It infects plants when temperatures are 55-60°F and there is high humidity. No fungicides or resistant cultivars are currently available for white mold, but some are under investigation. Long rotations without alternative host crops (potatoes, dry beans, canola) will be beneficial for reducing potential losses in sunflowers, as would avoiding high plant densities and excessive nitrogen fertilization. Rust can be effectively managed with tolerant cultivars and fungicides.

One particular disease, Rhizopus head rot, is capable of causing problems in both dryland or irrigated production. It requires physical wounding, following by a warm, humid environment. These conditions may be commonly encountered due to head moth infestation or summer hail storms.

Rhizopus head rot potentially may be the most damaging disease in Nebraska. Little can be done to manage it, except by controlling head moths and avoiding mechanically wounding plants. This disease is important enough that research will be conducted this summer to evaluate several new breeding lines for their resistance to the pathogen.

Cool, moist soil conditions will increase chances of seedling damping-off problems, so remember to plant seeds treated with fungicides. This summer we'll conduct a comprehensive survey of the increased acreage for predominant disease problems.

Contact me if you have any questions or suspect disease problems. We also would like to learn of growers who would like us to include their farms in our survey. Please call Bob Harveson at (308) 632-1239 (office) or (308) 632-1286 (lab) for more information.

Robert M. Harveson
Extension Plant Pathologist
Panhandle REC, Scottsbluff

Searchable *CropWatch* online at

cropwatch.unl.edu

Crop injury

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problems than recent weather. Effects of drought were already visible in some fields.

Where individual fields sustained severe injury, options are limited due to the lack of soil moisture for replanting or planting another crop. In these cases, it may be best to graze the wheat if cattle are availble or let the crop grow to maturity while protecting the field from erosion. If producers are considering planting it to a different crop, be sure to check the label of previously applied herbicides for replanting restrictions.

Corn emergence and growth in this area is generally delayed due to the colder than normal temperatures in early May. What has emerged looks pretty good.

John Smith, machinery systems engineer at the Panhandle REC in Scottsbluff: Freeze damage to this year's sugar beet crop in western Nebraska was significant. About half of the contracted sugar beet acres must be replanted due to the frost. Replanted sugar beet may lose one to two tons of yield per acre due to the shorter growing season.

When temperatures dipped into the low teens early on May 2, growers had planted about two-thirds to three-fourths of the state's 40,000 acres of sugar beets. Two-thirds of the planted acres had emerged.

Temperatures were so cold for so long that damage extended beyond emerged plants. In some areas the soil froze to a depth of about 1 inch, stopping seed germination. Most growers should know by now whether seeds planted before the frost will develop into viable seedlings.

Many growers had completed beet replanting by May 9. Others were watching their crop stands or finishing corn planting before replanting beets.

See *CropWatch* on the Web at *cropwatch.unl.edu* for the full report.

Scout emerging corn for insect pests

As corn begins to emerge, it is important to scout it frequently for damage from a variety of insect pests. This is true regardless of whether it was treated with an insecticide at planting time (liquid, granular or seed treatment) or whether it is a *Bt* corn hybrid.

High populations of insects may overwhelm the protection provided by these controls, and in some cases products are not labeled for the full spectrum of insects we may encounter in Nebraska.

Some early season insects to watch for include various cutworm species, and, in southeast Nebraska, the southern corn leaf beetle. Cutworms can cause serious damage to corn in the first couple weeks after emergence, so it is important to scout fields for damage. Several species of cutworms attack corn. The severity and the area affected will vary greatly, depending on species involved, previous crop history, and weather conditions. See the April 1, 2005 *Crop Watch* for a complete discussion of corn cutworm management.

Scouting and rescue treatments

Remember that early detection of a problem is essential because most of the cutting occurs within seven days of plant emergence. Generally, a rescue treatment should be considered if 5% or more (an average of at least 1 plant in 20) cutting is observed and the worms are one inch or less in length.

Rescue treatments are effective in controlling soil cutworms. Ambush 2E, Asana XL, Baythroid, Lorsban 4E, Mustang Max, Warrior, Proaxis, and Pounce 3.2EC (or generics) all will give satisfactory control as postemergence sprays. If the soil is dry or crusted, rotary hoeing immediately before or after Lorsban application may enhance control. The other insecticides are pyrethroids and should not be incorporated. See a full list of products and rates on the Department of Entomology Web site at *entomology.unl.edu/instabls/cutworms.htm*

For more information on managing this pest, see the Univeristy of Nebraska Cooperative Extension NebGuide, Corn Cutworms (G93-1153) at *ianrpubs.unl.edu/insects/g1153.htm*

Southern corn leaf beetles

A relatively new pest of corn - the southern corn leaf beetle – has caused damage periodically in southeast Nebraska since 2000. This insect has been reported to damage corn in northeast and north central Kansas over the last few years, and also has been reported in Missouri, Iowa and Illinois.

The adult overwinters in sheltered areas and becomes active in April. In addition to corn it may feed on weeds, especially cocklebur. The adults are 3/16 inch long, dark brown and often covered with soil particles, making them difficult to see. They hide in the soil during the day and are difficult to find. They feed on the stems of corn seedlings and may cut stems, causing damage similar to cutworms on seedling corn. They also feed on the edges of leaves, producing a notched appearance, similar to leaf feeding by cutworms. If abundant they may severely damage seedling corn.

Economic thresholds have not been researched for this insect, but use of thresholds similar to those for cutworms has been suggested. The same insecticides labelled for postemergence use against cutworms would be appropriate for southern corn leaf beetles.

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Frozen grain

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grain. If the bin is not equipped with a stirring device, you can achieve greater airflow and faster warming in the center of the bin by unloading several hundred bushels of grain prior to starting the aeration fan. This will leave a crater in the center of the bin which will lower resistance to airflow and encourage greater airflow through the center of the grain mass. After a warming front is pushed through the center of the bin, the grain can be loaded back into the bin or the grain could be leveled to restore uniform airflow through all the grain in the bin.

Continue to run the fan until the grain moisture content is below 16%. If you can carefully monitor the grain for heating, fans could be run intermittently until the grain is dry. Base fan operation on the equilibrium moisture content table found in *Natural Air Corn Drying*, University of Nebraska-Lincoln Cooperative Extension NebGuide 760.

References

1. *Holding Wet Corn with Aeration* (UNL NebGuide 862) *ianrpubs.unl.edu/farmbuildings/g862.htm.*

2. *Natural Air Corn Drying* (UNL NebGuide 760), *ianrpubs.unl.edu/farmbuildings/g760.htm*

3. Dayton Psychrometrics Web site, *www.sinclair.edu/community/daytonashrae/psychrometrics.htm*

4. *Protect your investment: Maintain stored grain quality*, December, 2004 *CropWatch* newsletter. *cropwatch.unl.edu/archives/2004/crop04-26.htm#stored_grain*

5. *Warm stored grain.* March 4, 2005 *CropWatch* newsletter. *cropwatch.unl.edu/archives/2005/crop05-1.htm#storage*

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Managing frozen, high moisture grain

The corn crop took longer than normal to mature in 2004 and many producers began harvest when corn was at 20-22% moisture. A large percentage of harvested corn was above 17% moisture. The combination of wet corn and less than ideal drying conditions resulted in some producers running aeration systems late into the fall or even into January before shutting down for the winter. In many cases, air temperatures had dropped into the lower 20s before producers discontinued fan operation.

If you were still aerating grain when air temperatures were well below freezing, hopefully you took advantage of periods in the early spring when we had cool, relatively dry, air to push a warming front through the grain. A final grain temperature of 30-35°F in March would have been ideal. Even high moisture corn keeps well at low temperatures. This provides a window of time to wait for conditions when the grain can be dried to safe storage moisture content using natural air.

Research under controlled laboratory conditions has shown 19% moisture corn held at a constant 30°F with aeration has a shelf-life of nearly 10 months and 17% moisture and 30°F corn has a shelf-life of about 22 months. Shelf life is defined as the time grain can be stored before losing 0.5% of its dry matter content. The shelf-life of corn in a bin that is not being aerated to maintain constant temperature is approximately one-third as long.

Avoid holding frozen, high moisture grain until late spring

To illustrate the seriousness of holding frozen, high moisture, corn into May, lets assume a bin of grain was cooled to 20°F and no further aeration was done until the air is 60°F and 50% relative humidity. Radiant and convective heating would have warmed the grain near the bin walls but the grain in the lower center of the bin will have stayed cold. Air at 60° F and 50% relative humidity has a dew point temperature of 41°F. Since the grain close to the bin walls was warmer to start with, it will be warmed to above the dew point temperature and moisture won't condense from the aeration air. More airflow is required to warm the colder grain in the center of the bin. More airflow means more water condensation into the cold grain since the grain temperature is below the dew point. The danger comes when the grain is below freezing. The moisture will turn to ice in frozen grain and enough ice could form to block airflow through the grain.

Air always takes the path of least resistance. This scenario could result in a pocket of frozen wet grain in the lower center of the bin that cannot be penetrated by air. You likely may not know you have this problem. Eventually, the grain in the middle of the bin will warm up and the scenario becomes more ominous because of the wet grain. Now you have a pocket of high moisture corn at higher temperature buried in the least accessible spot in the bin. Corn at 19% moisture and 65°F has a shelf life of about one month with aeration and about 10 days without aeration.

What should be done with frozen, high moisture grain in May?

The first priority is to bring the temperature of the grain above freezing. If possible, find a time when the relative humidity is low, then start the aeration system. Ideally, one would want to find a time when the dew point temperature of the air is no more than ten degrees higher than the coldest grain in the bin before starting the aeration system. These conditions are not likely to occur in mid May if grain is below freezing. In the future, aerate your grain regularly to maintain the proper grain temperature and avoid this problem.

If your drying bin is equipped with a stirring device, make certain you can manually turn the stirring augers to make certain they are not stuck in frozen grain before proceeding. If they are free, make a round with the stirring device before starting the aeration fan to help equalize the grain temperature in the bin.

Continue running the stirring device while aerating until the grain has been warmed to 40°F. Once the grain reaches a uniform 40°F, discontinue stirring natural air drying systems and allow a drying front to form and move through the

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Under laboratory conditions 19% moisture corn held at a constant 30°F with aeration has a shelf-life of nearly 10 months while 17% moisture held at the same temperature has a shelf-life of almost 22 months.