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CROP WATCH
University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources
University of Nebraska Lincoln

No. 2005-14, June 17, 2005

Corn nematodes tied to disease, crop losses

Disease caused by corn nematodes has been reported recently in several areas of Nebraska. Nematodes are microscopic worms in the soil that can feed on plant roots (*Figure 1*). Although you can't see them, their effects can be dramatic. Corn nematodes are present in every corn field. Damage severity and yield loss depends on which nematodes are present and their population densities.

Unlike soybean, where we are primarily concerned with one type of nematode (soybean cyst nematode), there are several genera of nematodes that cause disease in corn. Among those nematodes historically reported on corn in Nebraska are needle, sting, lance, dagger, lesion, and stubby-root. Some of these nematodes do NOT require sandy soil – contrary to popular belief.

Symptoms caused by corn nematode feeding are nondescript and may closely resemble those of other problems, so they are easily misdiagnosed and frequently overlooked. Symptoms on upper plant parts, such as yellowing, stunting, misshapen ears, and yield loss may mimic such disorders as nutrient deficiencies or drought. Damaged roots, like those in the photo, may appear necrotic, pruned, or excessively branched, resembling symptoms associated with herbicide damage, soil compaction, insect feeding, or other diseases. The affected areas often occur in isolated spots in a field, similar to the one shown in *Figure 2*, or to a lesser extent, as variability in plant height.

Symptomatic areas may be easier to locate early in the season and some nematodes travel deep in the soil as the summer progresses, making early season a good time to sample for nematodes.

Nematode analyses can be conducted by many agricultural testing labs, including the UNL Plant and Pest Diagnostic Clinic. Soil samples should be collected to a depth of 8 inches and represent no more than 10 acres. It is also a good idea to submit symptomatic roots, in addition to soil, for nematode analyses because some nematodes spend most of their lives inside the roots. Unfortunately, corn nema-

(Continued on page 124)

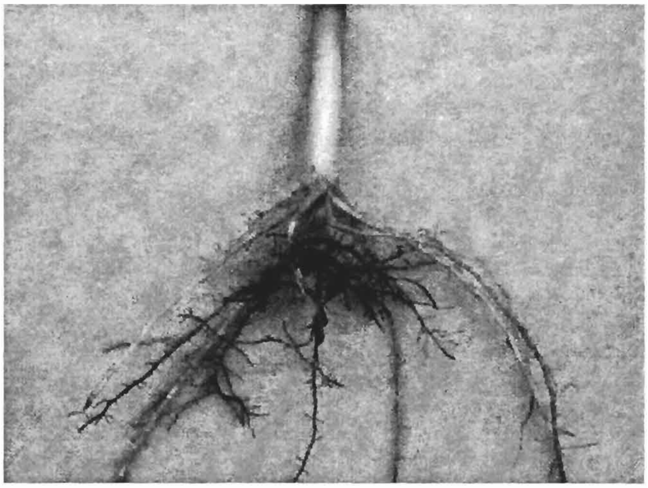

Figure 1 *(above)*: Eight-week-old corn root damaged by nematode. Figure 2 *(below)*: Nebraska field exhibiting corn nematode damage.

Inside

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Ag briefs

John Hay, Extension Educator in Pierce, Madison and Wayne counties: Haying is in full swing with the recent warm, dry weather. A strong southerly wind with gusts up to 80 mph or more came through Pierce County a week ago. Some soybeans planted in the sand were sand-blasted and had to be replanted, corn in end rows was whipped severely, but now looks okay. A few pivots are being used to apply nitrogen and there has been some spraying for weeds. The good growing conditions for corn and soybeans are also good for weeds and I am seeing lots of fields where weeds are winning.

USDA's Nebraska Agricultural Statistics Service: For the week ending June 12 variable temperatures and continued rainfall aided crop and pasture development but complicated hay harvest. With the ongoing rains, weed control has fallen behind in many fields. Precipitation since April 1 continued at average to above normal levels across all districts. The north central counties have recorded twice their normal precipitation since April 1 and the northeast has received 50% more than average.

Wheat condition remained stable and rated 7% very poor, 16% poor, 33% fair, 36% good, and 8% excellent. Fields were reported to be 93% headed, behind last year at 98% but near the average of 92%. Twenty percent of the fields were reported as turning color, well behind last year at 52% and the average at 37%.

Corn condition rated 2% poor, 23% fair, 59% good, and 16% excellent. Conditions continue higher than last year and normal.

Soybean planting moved to 98%, near last year at 97% and in line with the average. Soybean emergence at 92% was ahead of last year and average at 88%.

Sorghum planting was at 90% complete, behind 94% last year and 91% for average. Seventy percent of the crop had emerged.

Oat condition rated 3% poor, 25% fair, 53% good, and 19% excellent. Fifty percent of the crop has headed, compared to 67% last year and 53% for the average.

Alfalfa conditions improved slightly and rated 2% very poor, 9% poor, 38% fair, 40% good, and 11% excellent. First cutting was 62% complete, behind last year at 78% and average at 77%. Wet conditions have impacted quality.

Proso millet planting remained slow and was 17% complete, behind last year at 65%.

Dry bean planting progressed to 68% complete, behind last year at 79% and the average at 76%. Fourteen percent of the crop had emerged.

High Plains Ag Lab Field Day June 21

The 35th annual June Field Day will be June 21 at the University of Nebraska High Plains Ag Lab near Sidney. Speakers from the University, the USDA Agricultural Research Service, the Nebraska Wheat Board and other organizations will provide up-to-date information on:

- Wheat streak mosaic and Russian wheat aphid
- Crops for biodiesel production
- Nitrogen for winter wheat: Rate and timing
- Russian wheat aphid-resistant barley
- Wheat varieties
- Downy brome control in winter wheat
- Hard white wheat: Do we lead or follow?

Registration begins at 8:30 a.m. The field day will conclude with lunch. To get to the High Plains Ag Lab, take U.S. 385 to the Huntsman Elevator (6 miles north of Sidney or 7 miles south of Gurley), then drive 2.5 miles west, then 0.5 mile north.

The High Plains Ag Lab, a satellite unit of the Panhandle Research and Extension Center in Scottsbluff, is dedicated to improving profitability for dryland crops and livestock production. Of the 2400 acres at HPAL, about two-thirds is in rangeland and the remainder is in dryland crop rotation.

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

Asian soybean rust threatens common beans

Asian soybean rust (*Phakopsora pachyrhizi*) also may be a threat to common bean this year. The potential impact on dry edible and snap beans are of concern because we have many acres of these crops interspersed with or contiguous to soybean fields in the southeast, central and northern United States. Unfortunately, U.S. dry bean researchers and the industry at large have rather limited information on the genetic vulnerability of our diverse market classes, commercially grown varieties and advanced breeding lines to the genetically variable Asian soybean rust pathogen.

Preliminary evaluations at the USDA Ft. Dietrick Facility in summer 2004 and field observations in South Africa and Brazil in April 2005 suggest that dry bean varieties do vary in their reactions to the Asian soybean rust pathogen and are not affected as severely as soybeans. In addition, preliminary observations suggest that infection severity of susceptible dry beans diminished if they were located more than 10 feet from infected soybeans.

Symptoms on common bean

Chlorotic leaf spots develop into angular, tan to reddish brown or purple leaf lesions, 0.02-0.16 inches in diameter, within a week after infection (*Figure 1*). Infection is more apparent in older and aging leaves in the lower to mid levels of plant canopies. Up to 20 tan to brown uredinia (rust pustules), each less than 0.01 inch in diameter, develop in each lesion. Uredinia open by a pore to produce many pale brown to light tan or nearly white urediniospores. Sporulation occurs predominantly on the abaxial (lower) leaf surface. The angular lesions (*Figure 2*) resemble those of common bacterial blight and angular leaf spot both of which lack the microscopic conical uredinia on the lower surface of the leaf (*Figure 2*). Severe infection may cause premature defoliation of older leaves (*Figure 3*).

Disease cycle

Urediniospores, the primary means of disease spread, are distributed in the air by wind and rain, and can remain viable for one to two months, depending on environmental conditions. A dew period (free moisture) of 4-12 hours is required for the urediniospores to germinate and for infection to occur. Urediniospores do not germinate below 46°F or above 86°F. Maximum germination and infection occur at about 68°F. Upon germination, penetration of leaves is direct or through stomates to produce the angular lesion that usually contains multiple uredinia. Production of urediniospores starts about 10 days after infection and continues for several weeks. The optimal temperature for postinfection disease development is about 75°F. During the rainy season in the tropics (South Africa and Brazil), the prevalence of *P. pachyrhizi* on common bean often increases, whereas that of common bean rust, caused by *Uromyces appendiculatus*, may decline. Germination of teliospores has not been reported, and their role in the life cycle is unknown. Early disease development on common bean, as with soybean, occurs on older leaves inside the plant canopy.

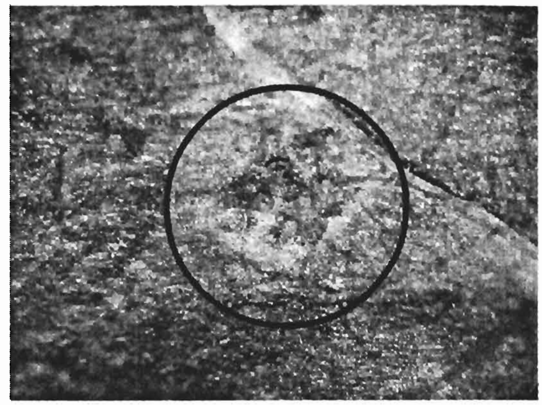

Figure 1. Magnification of uredinia in one lesion.

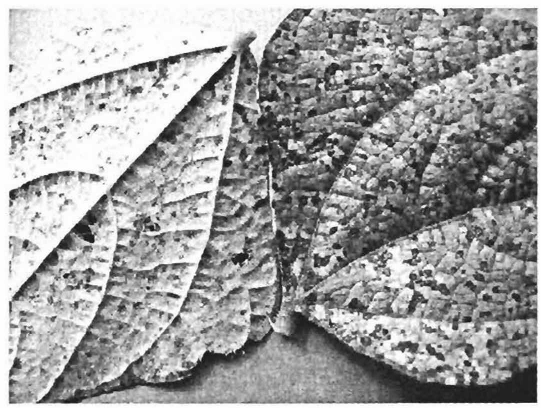

Figure 2. Angular, older lesions.

Figure 3. Widespread defoliation and plant damage.

Management

Little or no attention has been given to developing management tools for Asian soybean rust in common beans due to the minor importance of the disease in common bean. General integrated pest management recommendations for dry bean diseases include the following, and may also reduce Asian soybean rust impacts:

(Continued on page 122)

Rust in common bean *(Continued from page 121)*

1) Rotate out of dry beans for at least two years.

2) Eliminate bean debris and sources of volunteer beans in the fall and again in the spring.

3) Plant high quality, certified, treated seed of disease resistant varieties, if available and suitable for your market needs.

4) Follow recommended production practices to avoid stress from extremes of moisture, temperature, and soil compaction;

5) Manage water and fertilizer inputs to provide adequate, but not excessive amounts to avoid highly vigorous canopy development.

6) Carefully scout fields to detect foliar infection as early as possible.

7) Get confirmation of disease diagnosis from appropriate experts;

8) Monitor reports on weather patterns, disease forecasts, and confirmed sightings in your region.

9) When infection is confirmed in or near your field, implement a timely program of fungicides and bactericides with protectant and systemic modes of action.

10) Rotate fungicide chemistry, apply labeled rates, and stay within recommended spray intervals.

11) Adjust the combine at harvest to maximize seed quality and reduce loss of seed which can germinate next spring.

12) Thoroughly incorporate each season's crop debris + pathogens to reduce carryover and potential disease pressure the following season. Rely on cultivation and herbicide in next year's rotation crop to reduce volunteer bean emergence and possible infection by pathogens which can then be spread to next year's host crop.

These fungicides are likely to be effective against soybean rust (and common bean rust) of dry bean: maneb, Bravo/Echo (chlorothalonil), Endura (boscalid), Quadris/Amistar (azoxystrobin), Headline (pyraclostrobin).

Section 18 Emergency Label requests have been made by various bean-producing states for: Tilt/Propimax/Bumper (propiconazole), Folicur (tebuconazole), Laredo (myclobutanil), and Quilt (propiconazole + azoxystrobin). Check with local officials on the label status, restrictions and pre-harvest intervals for your state.

It is assumed that many currently grown commercial varieties may be susceptible to some degree, but resistance probably will be found in common bean, when it is screened. Research to identify common bean varieties with resistance to the Asian soybean rust pathogen and studies to characterize this resistance have been initiated.

Additional information on the status of soybean rust in the United States is available at these web sites:

- Stop Soybean Rust (by *Dealer & Applicator* and *Successful Farming* magazines and *Greenbook*; sponsored by Bayer CropScience), at *www.stopsoybeanrust/*
- Plant Management Network International at *www.plantmanagementnetwork.org/infocenter/topic/soybeanrust/*
- USDA Soybean Rust Site at *www.usda.gov/soybeanrust/*
- North American Plant Disease Forecast Center for soybean rust, hosted by the North Carolina State University at *www.ces.ncsu.edu/depts/pp/soybeanrust/*

Howard Schwartz
Extension Plant Pathologist
Colorado State University
James Steadman
UNL Plant Pathologist
M. Pastor Corrales
USDA/ARS Vegetable Lab

Learning which rust is which

Asian soybean rust = *Phakopsora pachyrhizi*

American soybean rust = *Phakopsora meibomiae*

Common bean rust = *Uromyces appendiculatus*

Soybean rust treatments may damage nearby apple orchards

Midwest apple growers should closely watch developments as soybean rust spreads into new states, but for different reasons than one might expect, a Kansas State University scientist said.

"Apple growers are expressing concern over the possibility of soybean rust developing in the Midwest, not because apples are a host for the disease, but because one of the available fungicides for rust management is toxic to certain varieties of apples," said Doug Jardine, K-State Research and Extension state leader in plant pathology.

The fungicide, azoxystrobin, labeled as Quadris for Asian soybean rust control, is phytotoxic to Macintosh and Macintosh-derived apple varieties, Jardine said. Azoxystrobin is also sold under the trade names Abound and Heritage.

If apple trees are subjected to the fungicide, leaves and twigs could die and fruit may drop.

"Conditions favorable for drift of the fungicide have caused problems in other parts of the country where, for instance, azoxystrobin was used in grape vineyards adjacent to apple orchards."

Jardine said, however, that Quadris has been used on wheat in Kansas for several years with no reported problems.

"Use of Quadris on soybean rust would simply increase the likelihood for trouble should there be orchards or backyard apple trees adjacent to soybean fields," he said.

Apple varieties grown in Kansas that are susceptible to azoxystrobin include Akane, Courtland, Gala, Macintosh, Mondial Gala, Royal Gala, Starkspur Mac, and Summer Treat.

The Quadris label contains a warning with regard to this problem and applicators who spray in the vicinity of apple trees should take the time to read it, Jardine said.

Potato leafhoppers have arrived; scout alfalfa

Potato leafhoppers have had ample opportunity the last two weeks to ride southerly air masses into Nebraska. Checks of alfalfa at the Northeast Research and Extension Center Haskell Ag Lab farm found low numbers of potato leafhoppers, indicating that scouting should begin. These pests do not overwinter in Nebraska and reestablish themselves annually.

These small (1/8 inch long), bright green, wedge-shaped insects may cause severe damage to alfalfa by injecting a toxin into the plant as they feed. This feeding results in a distinctive yellow or purple triangle shape at the tip of the leaf. First year spring-planted alfalfa fields are particularly attractive to and vulnerable to potato leafhoppers, as are fields planted last year. In older fields, these insects usually more of a problem for second and third cuttings. New resistant alfalfa varieties provide some protection; however, alfalfa in the seedling stage may still be damaged. All fields should still be scouted, as large numbers of leafhoppers may still cause a problem in resistant variety fields. (See *Tables 1-3* for dynamic treatment thresholds for potato leafhoppers at various alfalfa growth stages.)

Treatment decisions are based on numbers captured by sweep net. A sweep net is the only reliable way to scout for potato leafhoppers. Use the tables to help determine the need for treatment. Note that it doesn't take too many potato leafhoppers to cause an economic problem. Most insecticides registered for potato leafhopper will give good control. See *Table 4* on page 124 for a partial list of registered insecticides.

Keith Jarvi
Extension IPM Assistant

See *CropWatch* on the Web at:
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Figure. 1 Potato leafhoppers are small, but in significant numbers can cause severe damage to alfalfa, as shown in this photo.

Table 1. Dynamic treatment thresholds for potato leafhoppers (average number per sweep) on alfalfa that is 1 to 4 inches tall.

Value of hay	Cost of insecticide application (per acre)					
(per ton)	**$8**	**$10**	**$12**	**$14**	**$16**	**$20**
$ 60	0.40	0.50	0.60	0.70	0.80	1.00
$ 80	0.30	0.40	0.50	0.50	0.60	0.75
$100	0.25	0.30	0.40	0.40	0.50	0.60
$120	0.20	0.25	0.30	0.35	0.40	0.50
$140	0.20	0.20	0.25	0.30	0.30	0.40
$160	0.15	0.20	0.30	0.30	0.30	0.40

Table 2. Dynamic treatment thresholds for potato leafhoppers (average number per sweep) on alfalfa that is 4 to 8 inches tall.

Value of hay	Cost of insecticide application (per acre)					
(per ton)	**$8**	**$10**	**$12**	**$14**	**$16**	**$20**
$ 60	0.70	0.80	1.00	1.00	1.30	1.70
$ 80	0.60	0.60	0.75	0.90	1.00	1.30
$100	0.40	0.50	0.60	0.70	0.80	1.00
$120	0.30	0.40	0.50	0.60	0.70	0.80
$140	0.30	0.35	0.40	0.50	0.60	0.70
$160	0.25	0.30	0.40	0.40	0.50	0.60

Table 3. Dynamic treatment thresholds for potato leafhoppers (average number per sweep) on alfalfa that is 8 to 12 inches tall.

Value of hay	Cost of insecticide application (per acre)					
(per ton)	**$8**	**$10**	**$12**	**$14**	**$16**	**$20**
$ 60	2.00	2.40	2.80	3.00	3.90	5.00
$ 80	1.80	1.90	2.20	2.70	3.00	4.00
$100	1.20	1.50	1.80	2.10	2.40	3.00
$120	0.90	1.20	1.50	1.80	2.10	2.40
$140	0.90	1.00	1.20	1.50	1.80	2.00
$160	0.80	0.90	1.00	1.20	1.50	1.80

Tight water supplies call for management changes

When using furrow irrigation with limited water supplies, it's even more important to apply water uniformly and efficiently, said Dean Yonts, UNL irrigation engineer at the Panhandle Research and Extension Center at Scottsbluff.

Yonts recommends that these producers eliminate runoff from the field and deep percolation below the soil's root zone. Typically, in order to uniformly furrow irrigate a field, some runoff and deep percolation occurs as a result of trying to adequately irrigate the end of the field.

To eliminate runoff and deep percolation, Yonts recommends producers run shorter set times on their furrow irrigation system.

"Not running water across the soil for as long of a time period reduces deep percolation which puts water below the crops' root zone where it can't be used," he said. By avoiding deep percolation, water will be kept in the crops' root zone where it will be used by the growing plants.

In addition, Yonts recommends producers not let water run off at the end of the field.

"If water supplies are limited and water stress on a portion of your planted acres is a sure thing, let the stress occur at the bottom end of the field," he said. "If there is no deep percolation or no runoff, you have nearly a 100 percent application efficiency."

Potato leafhopper *(Continued from page 123)*

Table 4. Insecticides registered for control of potato leafhopper

	Product Name	*Common Name*	*Rate*	*Restrictions/ Comments*
R	Ambush 2 E or Ambush 25 W or			
	Ambush 25W WP	permethrin	3.2 -12.8 oz/acre	
			6.4 oz or less	0 phi
			Over 6.4 oz/acre	14 day phi
R	Baythroid 2	cyfluthrin	0.8 -1.6 oz/acre	7 day phi
	Cythion 5	malathion	1.5 - 2.0 pts/acre	0 phi
	Cythion 8	malathion	1.25 - 1.5 pts/acre	0 phi
R	Furadan 4 F	carbofuran	1.0 - 2.0 pts/acre	
			1.0 pt	14 day phi
			2.0 pt	28 day phi
	Imidan 70-WSB	phosmet	1.3 lbs/acre	7 day phi
	Lorsban 4 E	chlorpyrifos	0.5 - 1.0 pts/acre	
			0.5 pt	7 day phi
			1 pt	14 day phi
	Malathion 57 EC	malathion	1.5 - 2.25 pts/acre	0 phi
R	Penncap-M	methyl parathion	2 - 3 pts/acre	15 day phi
R	Mustang Max	Zeta-cypermethrin	2.24 – 4.0 oz/acre	phi of 3 days cutting or grazing 7 days harvesting seed
R	Pounce 3.2 E	permethrin	4 - 8 oz/acre	
			4 oz	0 phi
			Over 4 oz	14 day phi
R	Pounce 25 WP	permethrin	6.4 to 12.8 oz/acre	
			6.4 oz	0 phi
			Over 6.4 oz	14 day phi
R	Pounce WSB	permethrin	0.1 - 0.2 lb/acre	
			0.1 lb	0 phi
			Over 0.1 lb	14 day phi
R	Proaxis	gamma-cyhalothrin	1.92-3.2 oz/ac	1 day forage phi
				7 day phi
	Sevin 4 F	carbaryl	1.0 qt/acre	7 day phi
	Sevin 50 W	carbaryl	2 lbs/acre	7 day phi
	Sevin 80 WSP or 80 S	carbaryl	1.25 lbs/acre	7 day phi
	Sevin XLR	carbaryl	1.0 qt/acre	7 day phi
R	Warrior	lambda-cyhalothrin	1.92 - 3.2 oz/acre	7 day phi

R - Restricted Use *phi = preharvest interval*

Corn nematode

(Continued from page 119)

todes are favored by many of the recent changes in cultural practices. The reduction in insecticide use in favor of transgenic corn and the shift in insecticide chemistries favors nematode survival. Successful management of corn nematodes depends on accurate diagnosis. There is little to no information available on resistance in corn. Rotation to a nonhost crop is effective for some nematodes and control of grassy weeds is also important. Some chemicals provide control, but are not always economical. And, the use of good agronomic practices to reduce plant stress, particularly by maintaining optimal soil fertility and providing adequate soil moisture, reduces the extent of damage caused by corn nematodes.

There is no recent information on corn nematodes in Nebraska. This article was intended as a brief introduction and review of corn nematodes. You can look forward to more detailed information in future issues of *Crop Watch.*

Tamra Jackson
Extension Plant Pathologist

Research examines control of problem weeds with Roundup Ready tank mixes

Widespread and repeated use of glyphosate herbicides in Roundup Ready® crops raised several concerns from the practical standpoint such as potential for weed resistance and shifts in weed species. Currently there are no known cases of glyphosate-resistant weeds in Nebraska; however, it appears that our fields are experiencing a slow shift in weed species. In the last three years, university weed specialists have received complaints of glyphosate failing to control certain weed species, including some "new weeds." The species included: marestail (horseweed), morning-glory (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.

The purpose of this article is to summarize preliminary data from UNL studies conducted at Concord and North Platte in 2004, with the objective to test and compare glyphosate tank-mix with other herbicides to control above mentioned weed species.

We used a labeled rate of glyphosate (Roundup WeatherMax at 22 oz/ac) tank-mixed with "half rate" of seven common broadleaf postemergence herbicides: Classic 25DF (0.3 oz/ac), Cobra/Phoenix 2EC (5 oz/ac), Raptor 1SC (3 oz/ac), Pursuit (Extreme)(3 pt/ac), Reflex/Flaxstar 2EC (8 oz/ac), Scepter 70DG (1.44 oz/ac), and Ultra Blazer 2 SC (12 oz/ac). Each tank-mix contained appropriate amounts of additives such as AMS (2.5 lbs/ac), NIS (0.125% v/v) and/or COC (1% v/v) as indicated on the product label. Each tank mix was applied at three growth stages of the weed, targeting

1) 2- to 5-inch weeds (early POST);

2) 6- to 12-inch weeds (mid POST); and

3) 12- to 20-inch weeds (late POST).

The level of weed control at 21 days after herbicide treatment varied from 10% to 100%, depending on the weed species and tank-mix used. Weed size also was an important factor that determined the overall level of weed control (*Table 1, page 125)*).

Most species that were 2-5 inches (early POST applications) were controlled relatively well with a tank-mix of the label rate of Roundup WeatherMax® with appropriate herbicides. For example, a tank-mix of Roundup and Classic provided 90% control of 4-inch sweet clover compared to much lower control levels of 40% and 10% for 8-inch and 14-inch sweet clover, respectively (*Table 1*), indicating the importance of the plant size. A few species were controlled well regardless of their size. For example, a tank-mix of Roundup and Classic provided excellent control (more than 90%) of Russian thistle and kochia regardless of plant size. For weed specific control levels and tank-mixes, see *Table 1.*

This data indicates potential to effectively control these species with various tank mixes if applied early POST (weeds up to 5 inches tall). Taller weeds will require higher rates of broadleaf herbicides, perhaps a full recommended rate, however, a study is needed to confirm this hypothesis.

Tank mixing glyphosate with various herbicides also would provide additional modes of action for weed control, thus reducing the chance of weed resistance developing. Furthermore, products like Extreme and Scepter also could provide additional soil residual activity for prolonged weed control, one of the goals of an integrated weed management program. Using various weed control tools is not a new thing, we only "forgot" about it since the introduction of Roundup Ready crops. Changing modes of action in your herbicide program is also one of the basic elements of an Integrated Weed Management. I believe that the Roundup Ready technology fits well within an integrated system, and that the value of this technology can be preserved only by proper management and reduced overuse.

Stevan Knezevic
Extension Weeds Specialist
NEREC Haskell Ag Lab

Market Journal focuses on wheat crop

This week *Market Journal* travels to western Nebraska to examine the wheat crop. Host Doug Jose talked with Bob Klein, extension cropping systems specialist at the West Central REC in North Platte, about some of the problems growers are having with this year's wheat.

Last fall much of the wheat had an extended growing season, during which it used more than the usual amounts of soil moisture and nitrogen. Some areas, which have had less rainfall this spring, are now showing serious damage due to lack of soil moisture.

This week's show also includes an interview with Paul Burgener, extension ag economics research analyst at the Panhandle REC in Scottsbluff, who looks at recent market trends.

Market Journal, a production of UNL Extension, is broadcast Saturdays at 6:30 a.m. on NETV and Sundays at 9 a.m. on NETV2.

Table 1. Weed species and their heights at the time of herbicide application, and level of weed control (%) at 21 days after application with 22 oz of Roundup WeatherMax® tank mixed with various herbicides at the NEREC Haskell Ag Lab farm in 2004 (preliminary data).

Weed height (inches)	*Roundup (22 oz) + Classic (0.3oz)*	*Roundup (22 oz) + Phoenix (5 oz)*	*Roundup (22 oz) + Raptor (3 oz)*	*Extreme alone (48 oz)*	*Roundup (22 oz) + Flexstar (8 oz)*	*Roundup (22 oz) + Scepter (1.44 oz)*	*Roundup (22 oz) + Ultra Blazer (12 oz)*
Field bindweed							
3	95	100	100	100	87	93	100
6	90	90	93	84	88	90	97
9	75	87	87	73	88	90	86
Ivyleaf morningglory							
4	82	73	72	73	67	67	73
8	33	47	50	27	65	43	63
12	48	45	27	20	63	32	57
Kochia							
4	100	97	100	100	93	100	93
12	97	93	95	98	97	100	97
20	92	90	93	93	97	95	95
Russian thistle							
5	100	97	100	100	93	100	100
10	100	100	100	100	100	100	100
15	100	98	100	100	100	100	100
Yellow sweetclover							
4	90	83	83	78	97	70	100
8	40	53	43	38	90	47	95
1	41	01	73	17	33	13	35
Velvetleaf							
5	90	93	100	98	92	98	85
10	77	95	92	92	85	90	92
21	48	88	83	82	77	83	87
Venice mallow							
6	85	93	82	85	78	78	77
10	73	68	80	60	67	78	78
18	73	72	57	33	68	78	68
Common waterhemp							
4	100	100	100	100	93	100	92
9	85	80	95	97	87	93	80
14	75	77	83	83	82	87	78
Wild buckwheat							
3	83	93	83	100	87	87	88
6-12 inch runners	53	90	70	63	78	75	85
6-24 inch runners	50	67	68	57	73	68	75
Volunteer RR-corn							
V5 (10-12 inches)	53	20	100	77	34	92	48
V8 (18-20 inches)	10	17	77	70	27	82	47
V10 (30-36")	10	17	68	57	40	65	22

When planning control measures

Rank weed species competitiveness in soybean

Weed scientists have developed the concept of competitive indices as a scale for ranking competitiveness of different weed species. Competitive indices are usually based on the dry matter produced by weed plants. Weed competitiveness is highly influenced by cropping practices, including crop row spacing. For example, narrower crop rows can reduce the competitiveness of weed species by 20-50% compared to wider rows. Weed competitiveness also depends on the weed emergence time relative to the crop growth stage. In general, later emerging weeds are much less competitive than earlier emerging ones.

Field studies were conducted at two locations in eastern Nebraska in 2002 and 2003 to determine and compare the values for competitive indices among weed species as influenced by soybean row spacing and the weed emergence time relative to the crop's growth stage. This study is also a Master's degree project for Shawn Hock.

Soybeans were planted in 7.5- and 30-inch rows. Seven broadleaf and four grassy species were planted at three soybean growth stages: crop planting (VP), crop emergence (VE), and 2nd trifoliate stage (V2). The species included common lambsquarters, redroot pigweed, common waterhemp, common sunflower, common cocklebur, Pennsylvania smartweed, giant ragweed, yellow foxtail, giant foxtail, fall panicum, and barnyardgrass. Soybean yield data, weed biomass, and weed seed production were collected at the season end.

The most competitive weed found in this study was common sunflower, producing twice as much dry matter than any other species. Common cocklebur was the next most competitive weed followed by giant ragweed and then velvetleaf. Common waterhemp was more competitive than redroot pigweed but less competitive than velvetleaf. Common lambsquarters was the next competitive and slightly more competitive than the grassy species. Giant foxtail was the most competitive grass, followed by barnyardgrass, fall panicum and yellow foxtail. In general, competitive indices were affected by row spacing and emergence date. Weeds growing in 30-inch rows were more competitive than those in 7.5-inch rows. Weeds also were more competitive when emerging with the crop than when emerging a week or two later.

The major practical implications of this study are:

1) It's important to properly identify weed species and their composition before making weed management decisions since weed species differ in their competitiveness,

2) Planting soybean in narrower rows will reduce the competitiveness of most weed species, providing a competitive advantage to the crop.

3) Scout fields to determine weed emergence times relative to the crop stage, because data shows that weeds emerging a week or two after the crop are much less competitive than those emerging with the crop.

This study was partially funded by the North Central Regional Weed Science grant.

Stevan Knezevic
Extension Weeds Specialist
NEREC Haskell Ag Lab

Second cutting of alfalfa

Planning can provide extended options

If you cut alfalfa in early to mid May because of freeze damage or rapid plant development, your second cutting may be ready to go. Since we still are fairly early in the year, the potential for high quality should be pretty good with an earlier haravest. Before you decide to cut or to wait, do a little planning. First, plan how this hay will be used. If it's for dairy cows or horse hay, cut as soon as possible.

Plan how long you hope to keep this stand. Repeated harvests when alfalfa is young will stress plants, making them susceptible to insects, diseases, and winter injury or death. For long-term stands, at least one of the year's remaining harvests need to wait until plants are blooming well, at least 40 days after the previous cutting. You can wait now with this cutting or wait later this year.

Plan pest control. If you have good soil moisture, this is a prime time for weeds to get started in your alfalfa. Also, insects like potato leafhoppers *(see page 123)* are being found in fields. Be ready to spray pesticides as soon as problems become apparent.

Early first cuttings lead to potentially early second cuts and extra flexibility to time hay harvests the rest of the year. Use this opportunity to produce the kind of hay you need and want instead of allowing weather and the calendar determine your harvest schedule.

Bruce Anderson
Extension Forage Specialist

Attend one or both days

Midsummer Crop Diagnostic Clinic July 14-15

Agribusiness professionals and crop producers will take a close-up look at field conditions, research and techniques at the University of Nebraska-Lincoln's midsummer Crop Management Diagnostic Clinics July 14-15.

The UNL Extension clinics begin each day with 7:30 a.m. registration at the Agricultural Research and Development Center near Mead and start at 8 a.m.

Participants can attend one or both of the clinics as subject matter will be different each day.

July 14 topics will include: corn plant distribution -- population, twin rows and equidistance; corn rootworm technology; hands-on crop scene investigation (CSI); diagnostic lab update; Liberty Link vs. Roundup Ready weed control system; relay cropping -- wheat and soybeans; and soybean rust.

July 15 topics will include: occasional tillage for improvement of no-till systems and crop nutritional disorders; managing irrigation for maximum profits; root dynamics; corn nitrogen credits; hands-on crop scene investigation; nutrient management tools; and water optimizer software demonstration.

Presenters include UNL extension educators and specialists.

Early registration is recommended to reserve a seat and resource materials. Cost for attending one clinic is $130 for those registering by July 7 and $180 after. Cost for attending both clinics is $225 before July 7 and $275 after.

Certified Crop Advisor credits expected for this workshop are: two in crop management and four in crop protection for July 14, two in nutrient management and four in soil and water management for July 15. For more information or to register, contact the ARDC at CMDC Programs, 1071 County Road G, Ithaca, Nebraska 68033, call (800) 529-8030, fax (402) 624-8010, e-mail cdunbar2@unl.edu or visit the Web at *ardc.unl.edu/training.htm.*

Other summer Crop Management Diagnostic Clinics include late season training Aug. 24 and yield monitor training Sept. 7.

Grazing Conference Aug. 8-9 in Kearney

The 2005 Nebraska Grazing Conference in Kearney will give producers the latest information in grazing strategies and management, a University of Nebraska-Lincoln forage specialist said.

The fifth annual conference will be Aug. 8-9 at the Kearney Holiday Inn. It will feature presentations by national grazing experts and Nebraska producers to help other producers increase their profits without excessive risk, said Bruce Anderson, UNL forage specialist.

"The Nebraska Grazing Conference has been developed by people involved in Nebraska's grazing livestock industry from across the state to present the most current information on grazing livestock systems and to increase the visibility of the grazing livestock industry and the state's grazing lands," Anderson said.

Forage-based livestock production is a vital component of the agricultural economies of states in the north central region, which includes Nebraska, he said.

"This region possesses 33% of the nation's beef cow herd and finishes more than 53% of cattle marketed for meat," he said. "Forages account for 80% of the feed units consumed by beef cattle and, therefore, represent an extremely important resource to the industry."

Program registration begins Aug. 8 at 9 a.m. Gov. Dave Heineman is scheduled to open the program. That day's program topics include: using animal behavior to better manage grazing, integrated management of red cedar, economic considerations in buying a ranch, monitoring cattle markets and input costs, and concurrent sessions on cedar tree control and irrigated pastures. The day will conclude with a banquet and evening session on government cost-share programs.

Program topics the second day include: grassland monitoring, rotational grazing without fences, increasing productivity with help from dung beetles and soil organisms, and concurrent sessions on grazing for wildlife and pasture-finished/grass-fed beef production and marketing. The program will conclude around 2:30 p.m.

Registration is $70 before Aug. 1. Registration includes two lunches, evening banquet and materials. Registration after Aug. 1 is $90. One-day registrations (not including the banquet) are $35 before Aug. 1 and $45 after Aug. 1.

For more information or to register, contact the Center for Grassland Studies at (402) 472-4101, e-mail grassland@unl.edu or visit the Web at *www.grassland.unl.edu.*

To make hotel reservations, contact the Holiday Inn at (800) 248-4460 and specify the Nebraska Grazing Conference.