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## CropWatch No. 2003-25, October 24, 2003

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## Damage spreads in 2003

# Sample now for soybean cyst nematode

As I visit with farmers, field scouts and seed company representatives in eastern Nebraska, I continue to get reports of lower yields because of soybean cyst nematode (SCN). Often the first indication of an SCN infestation is when yields don't meet expectations and other possibilities for lower yields have been eliminated, even though the plants looked great.

Frequently, this is when a farmer first starts thinking about sampling for SCN. Soil samples for SCN can be collected any time; however, the best time is right after harvest. This is due to several reasons:

- Farming activities are slower after harvest, allowing more time to collect soil samples.
- Poor yielding fields or areas in fields are fresh in your mind, making it easier to identify and sample those areas. (See Figure 1

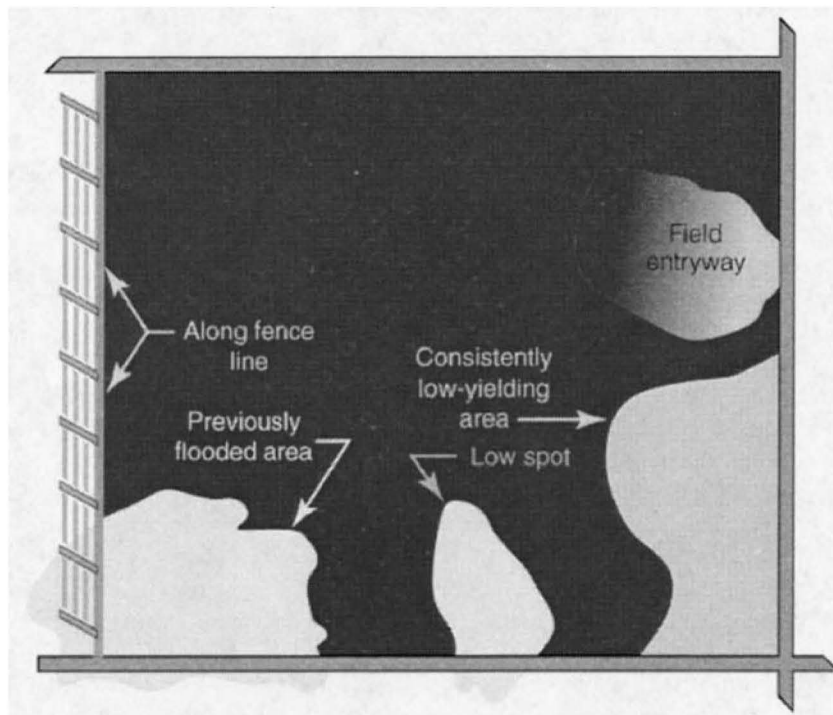


Figure 1. Likely areas for soybean cyst nematode infestations.

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(above) for typical areas for SCN infestations.)

- If in a rotation, you can sample fields that will be planted to soybeans next year to determine if SCN is present, and then order SCN-resistant seed or make other planting decisions accordingly.
- If sampling a field that was in soybeans this year and fall (recreational) tillage has not occurred, you can sample right next to the existing row so you are pulling a sample that will include part of the root mass, increasing the chance of

positively detecting SCN if it is present.

- Testing labs are generally not as busy at this time of year and you can get results back quicker and have more time to make any management decisions based on the results.

### Taking samples

Taking a soil sample for SCN is the same as taking a topsoil sample for fertilizer recommendations. In fact, you can collect one sample and

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## Updates

**Douglas Anderson, Extension Educator in Nuckolls, Thayer, and Fillmore counties:** Bean harvest is almost over and the corn is still wet, running about 25%. Wheat is in good condition with some being sold right from the field, but most is in storage. Milo yields are just being tested but dryland fields are expected to be in the range of 20 to 30 bushels per acre.

**Randy Pryor, Extension Educator in Saline County:** Harvest is in the "home stretch" this week. Some farmers with a few remaining bean fields will finish beans and switch back to corn and sorghum this week. Dryland bean yields surprised many with reports of 25 to 35 bu/ac averages despite the drought stress in July through mid August. Dryland corn yields are quite variable within field, depending on crop rotation and tillage effects, and range from 17 to 75 bushels per acre. Irrigated corn yields are excellent. Sorghum harvest had been delayed due to higher moisture contents. Dryland sorghum and irrigated corn harvest should pick up with this week's drying conditions.

**Ralph Anderson, Extension Educator in Buffalo County:** The soybeans are 99% harvested. The wet corn is in the bunkers and the combines have been idling on the field edges and getting more road time looking for dry fields than field time harvesting corn during the past two weeks.

That may change this week as corn appeared to dry down some over the weekend and we hope we can find corn under 20% this week. The stalk grazers are anxious to move their cows into the stalk fields and the "fall tillers" who have their corn out, are fencing fields and chopping stalks.

Although we have adequate surface moisture for now, our subsoil levels still reflect two years of below normal moisture and need

to be recharged before the coming growing season.

Recent prices for soybeans and cattle have had positive impacts on the general attitude of the farming and agri-business community. Pleasant fall weather also has helped everyone's mental attitude. In general, life is good in Buffalo County!

**USDA Nebraska Agricultural Statistics Service:** Corn condition rated 14% very poor, 13% poor, 22% fair, 31% good, and 20% excellent. Irrigated fields rated 77% good and excellent, while dryland fields rated 15% good and excellent. Corn harvest reached 42%, slightly behind last year at 44% and a week behind average at 58%.

**Soybean** harvest progressed to 85% complete, ahead of last year at 75% and average at 82%.

**Sorghum** condition rated 20% very poor, 30% poor, 37% fair, 13% good, and 0% excellent. Harvest was 49% completed, behind last year at 54% and average at 59%.

**Dry bean** harvest was virtually complete with 99% finished, ahead of 94% last year and 96% average.

**Wheat** seeding was virtually complete at 99%, the same as last

year and average. Ninety-one percent had emerged, ahead of last year and average at 90%.

**Proso millet** harvest advanced to 97% complete, ahead of 91% last year.

**Alfalfa** condition rated 15% very poor, 21% poor, 34% fair, 27% good, and 3% excellent. Fourth cutting activities were nearing the end as 98% was harvested, ahead of both last year and average at 95%.

**Nebraska feedlots**, with capacities of 1,000 or more head, contained 1.83 million cattle on feed on October 1, down 7% from last year and 6% below October 1, 2001. Feedlot placements in September totaled 520,000 head, up 16% from both 2001 and 2002.

Marketings of fed cattle during September totaled 345,000 head, up 3% from last year and 10% above September two years ago. Other disappearances were at the same level as the previous two years.

Nationally, cattle and calves on feed for slaughter market in the United States totaled 10.2 million head on October 1, 2003. The inventory was 2% below October 1, 2002 and 8% below October 1, 2001. Placements in feedlots during



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## Soybean cyst nematode

(Continued from page 233)

submit half for SCN analysis and the other half for fertility analysis. Collect a minimum of 15 soil cores around the roots (if plants or stubble rows are present) to a depth of 6-8 inches. The more soil cores you collect, the better the sample. SCN is generally not evenly distributed through a field and only collecting a few cores may give a false negative reading.

Thoroughly mix the soil cores in a bucket. A wide blade putty knife is excellent for breaking up the soil and insuring a representative sample. Fill a standard soil-sampling bag or box with the soil mix, store samples in a cool place (not in the sun), and ship, as soon as possible, to the University of Nebraska Plant & Pest Diagnostic Clinic; 448 Plant Sciences Hall; P.O. Box 830722; Lincoln, NE 68583-0722 or to a commercial diagnostic laboratory that does nematode analysis.

Include the following information with the sample:

- Contact information: name, address, and telephone number of collector and grower
- Number of acres sample represents
- Cropping history of field and current crop

Contact your local Cooperative Extension office for the current cost and for a sample submission form to submit with your sample.

If you chose a commercial laboratory, make sure the laboratory provides results in terms of number of **eggs** per 100 cc soil. Cyst counts alone do not accurately reflect nematode levels. Soil sampling this fall is the first step toward controlling SCN and avoiding reduced yields next fall from this pest.

For more information, pick up a copy of NebGuide G99-1383, *Soybean Cyst Nematode Biology and Management*, available at your local Cooperative Extension office.

**John Wilson**  
Extension Educator

## Benefit from the latest in Nebraska ag research

A Nov. 13 research symposium to be broadcast to five locations across the state will provide Nebraska agribusiness professionals and producers the latest information in research and crop management.

The symposium will be broadcast live from East Campus at the University of Nebraska-Lincoln to the Panhandle Research and Extension Center at Scottsbluff, West Central Research and Extension Center at North Platte, Lifelong Learning Center at Norfolk and College Park in Grand Island.

Registration begins at 8:30 a.m. CST and the program will be from 9 a.m. to 3 p.m. The symposium is designed for crop consultants, seed corn representatives, agronomists, producers and others who make crop management decisions. Presenters include NU faculty, specialists and researchers.

Each year participants provide input on the event and suggest topics for future symposiums. Last year, 81% of participants reported they would recommend the conference to others in their company or industry.

Topics this year include: an update on the Nebraska Soil Fertility Project; the soybean breeding program at UNL; irrigation water allocation; starter fertilizer for no-till corn and grain sorghum; hybrid maize -- a new simulation model for

understanding corn yield and making management decisions; irrigated pastures; what it takes to produce identity preserved grain; replacing forage lost by drought; refuge acres for insect resistance management; and Roundup Ready corn.

Attendees can apply for five certified crop adviser continuing education credits in the following areas: one hour nutrient management, one hour soil and water management, two hours crop management and one hour pest management.

Registration is \$90 for Nebraska Agri-Business Association members and Nebraska certified crop advisers and \$105 for non-members, non-CCA registrants and out-of-state participants. Those registering by Nov. 1 will receive a 5% discount. Registration includes resource materials, refreshments and lunch. For more information or to register, contact the Nebraska Agri-Business Association, 1335 H St., Suite 100, Lincoln, Nebraska 68508-3784; call (402) 476-1528; fax (402) 476-1259 or e-mail [info@na-ba.com](mailto:info@na-ba.com).

The symposium is sponsored by the Nebraska Agri-Business Association and Cooperative Extension in NU's Institute of Agriculture and Natural Resources.

## Hot off the press

University of Nebraska Cooperative Extension recently released the following new or revised publications. These should be available from your local Extension office.

**Calculating the Value of Manure for Crop Production (G03-1519):** criteria and guidelines to determine the market value of

manure for crop production (<http://www.ianr.unl.edu/pubs/wastemgt/g1519.htm>)

**Fertilizer Recommendations for Soybeans (G87-859):** recommendations on managing soil fertility to optimize the profitability of soybean production (<http://www.ianr.unl.edu/pubs/fieldcrops/g859.htm>)



# Virus may be causing green soybean plants

Producers are finding some soybean fields this year still have green plants at harvest. This happens each year and can be caused by a variety of factors, including soybean viruses. The green plants that I am referring to are not those with green stems only, but rather those with leaves and reduced pod development. These green plants often are observed in pockets or at field margins and may or may not be stunted. The big impact with this is that these field locations typically do not yield well.

In the last several years we have identified soybean fields in Nebraska with Tobacco Ringspot Virus (TRSV). The other name for this disease is bud blight, however we do not see the bud blight symptom with all soybean varieties. At this time I don't have a good handle on how common this is, but I would suggest that it could be quite common in areas where we have CRP or grassy borders. The grassy areas serve as a reservoir for the virus and thrips. Thrips are thought to be the primary vector for this virus.

Disease symptoms can include: blight or death of the terminal growth with curving to form a crook, adventitious leaf and floral buds with excessive proliferation, brown



One of the symptoms of Tobacco Ringspot Virus in soybean is blight or death of the terminal growth after having developed into a crook-shaped stem.

discoloration of pith, stem, and branches, shortened petioles, distorted leaves that tend to cup or roll, and discoloration of the leaf veins in affected leaves. Pods on these plants tend to be underdeveloped or aborted. Dark blotches may be present on pods, which set prior to infection. Maturity will be delayed

in infected plants – this is the most commonly observed symptom and is why the pockets of infected plants maintain leaves and have reduced pod development. I am aware on one field that this happened in last year – where yields were 50-60 bu/ac and the pockets of infected plants (small) had yields approaching 10 bu/ac with the yield monitor.

If you have observed this symptom and would like confirmation of the problem, contact me at the UNL Department of Plant Pathology and we can process your samples (free for this test). Sample diagnosis for Tobacco Ringspot Virus requires a serological test

and cannot be done with symptom expression. Samples can be sent to 448 Plant Science Bldg., University of Nebraska, Lincoln, NE 68583-0722 or call (402) 472-2559 for information on sending samples.

**Loren J. Giesler**  
Extension Plant Pathologist

# Controlling winter annuals in dormant alfalfa

Do you regularly have an abundance of yellow or white flowered weeds like mustard or pennycress in first-cut alfalfa? Are downy brome or cheatgrass a problem in the spring? While these weeds are tiny right now and hard to see in your alfalfa, next spring they could grow rapidly, reducing alfalfa yield, thinning stands, and lowering forage quality.

Fortunately, help is readily available from several herbicides. To control winter annual weeds in stands over one year old, use Karmex, Sinbar, Sencor, and Velpar.

Recent cold temperatures probably turned your alfalfa practically dormant, but soils haven't frozen solid yet. This is perfect timing for using these herbicides.

All these herbicides do a good job of controlling broadleaves like pennycress and mustard. They also do a pretty good job of controlling downy brome, except for Karmex. While Karmex is not good for downy brome, it still may be the best choice for broadleaf control on low organic matter soils.

If you seeded alfalfa this year, you need to use other herbicides.

Pursuit and Raptor are best if you have both broadleaf and grassy weeds. If just grasses, like volunteer wheat, are a problem, use Poast or Select. And for just broadleaves, use Buctril or Butyrac, as long as temperatures remain well above freezing for a couple days.

Take advantage of the opportunity this fall to control weeds in your alfalfa and you won't be plagued by them next spring.

**Bruce Anderson**  
Extension Forage Specialist

## Fall is a great time to control winter annual weeds

Winter annual weeds (henbit, horseweed, pennycress, etc.) can be quite susceptible to fall herbicide application. While many farmers may still be busy with harvest and storage concerns, there is still plenty of time to attack these weeds yet this fall. Winter annual weeds emerge in the fall from early September to November. In spring they bolt and produce seeds, and in the fall, the cycle begins all over again.

Many people wait until spring to attempt to control these weeds. To achieve the best control, these weeds should be sprayed as early as possible in the spring; however, often several things may affect that. First is Mother Nature. Early spring weather is often unpredictable, ranging from 80°F one day to 20°F and 6 inches of snow another day. It also can be difficult to get a sprayer over the ground in spring and herbicide performance may be reduced in cooler weather. The second factor is the growth stage of

winter annual weeds. In spring they are in their reproductive mode. They bolt quickly, flower and before you know it they are setting seed. Since the plant is larger and flowering, it is less likely to get a lethal dose of herbicide.

This all points to why fall is a great time to control winter annuals: The weather is more cooperative and weeds are typically in the rosette (vegetative) stage and more susceptible to herbicides.

Timing is not as critical as you may think. Winter annuals can typically be sprayed from late September until early December, weather permitting. Of course if snow is on the ground, don't expect good weed control but if there is another open fall, a fall application can work quite well.

In addition, fall applications usually require less herbicide and less expense. Some of the common winter annuals (henbit, horseweed, and pennycress) can be readily

controlled with just 1-1.5 pints of 2,4-D or 1 pint 2,4-D + 4 ounces dicamba, 24 ounces of glyphosate, or 1 pint 2,4-D + 16 ounces glyphosate. It should be noted that atrazine is not labeled for fall application in Nebraska.

All in all fall application will give you more bang for your buck plus it will give you an excuse to get out of the house and into the tractor.

**Brady Kappler**  
Weed Science Educator

### ***Insurance workshops to focus on new livestock policies***

Livestock insurance policies, similar to crop insurance policies, are a new risk management tool being offered in several states, including Nebraska.

To address user questions and provide more information on these, the University of Nebraska, Kansas State University and Colorado State University will focus on Livestock Risk Protection (LRP) insurance policies at the 5th annual ag insurance workshops. "The Changing World of Crop Insurance: Livestock Insurance, What's Next" is a one-day workshop to help crop insurance agents, agricultural lenders, farmers, ranchers and financial consultants get the latest information on changes in federal ag insurance programs.

The Nebraska session will be held at the Interstate 80 Holiday Inn in Grand Island on Nov. 19. Workshops also will be Nov. 18 at the Holiday Inn in Great Bend, Kansas, and Nov. 20 at the Fairgrounds Event Center in Brush, Colorado. Registration is from 7 to 8:30 a.m. with the conference expected to adjourn at 4:30 p.m. The program is being sponsored by the representative universities and National Crop

## *Converting alfalfa to row crop starts with fall weed control*

Fall is the best time to kill older alfalfa stands with herbicides in preparation for planting other crops next year. Controlling alfalfa with herbicides is more effective and less expensive than using tillage. Fall-killed alfalfa sod results in a mellow seedbed for no-till planting. Why plow? Eliminating tillage by planting your next crop no-till into dead alfalfa sod saves moisture, soil, money and will likely result in higher crop yields.

Fall herbicide applications are effective and provide time for herbicide residues to dissipate before planting the next crop. In spring often there is not enough time after herbicide application for residues to dissipate before timely

planting of the next crop. Allowing alfalfa to grow in the spring prior to treatment also uses soil moisture that would otherwise be available to the crop. One key to success with a fall treatment is that the alfalfa must still be actively growing. A light frost presents no problem but a hard freeze followed by discoloration and drying of the foliage is a sign that it's too late to treat this year.

Treatments of choice for killing alfalfa are 1.5qt/ac 2,4-D, and 1.0 qt 2,4-D + 0.5 pt Banvel/Clarity. Next spring plan your weed control program just as you would for any other no-till field.

**Alex Martin**  
Extension Weeds Specialist

*(Continued on page 239)*



## Using aerial imagery as a crop management tool

Farmers are beginning to look to the sky for more than just sun and rain. They are using aerial imagery to improve pest management, nutrient application, irrigation uniformity, and even predict yields.

Producers wanting to learn more about aerial imagery technology and how to incorporate it into their farming operation as a crop management tool will be interested in a new clinic.

The Nebraska Agricultural Technologies Association (NeATA) and University of Nebraska Cooperative Extension will host clinics on "Using Aerial Imagery in Crop Production" Monday, November 24, at College Park in Grand Island and Tuesday, November 25, at the Agricultural Research and Development Center near Mead. Both programs begin at 8:45 a.m. and continue through 3:30 p.m.

"This is the first clinic of its kind in Nebraska. Crop growers and consultants are rapidly adopting this technology to improve their management systems," said NU Extension Educator Dave Varner. Twenty Nebraska producers cooperated with NeATA to capture imagery of their fields this past year and will be available at the clinics to discuss their experiences. Researchers and experienced agricultural consultants and specialists will address specific topics, including:

**Solving Agronomic Issues with Field Imagery** with Richard Ferguson, UNL soils specialist; and Jerry Mulliken, JM Crop Consulting;

**Imagery Sources and Quality Issues** with Aaron Schepers, Cornerstone Mapping;

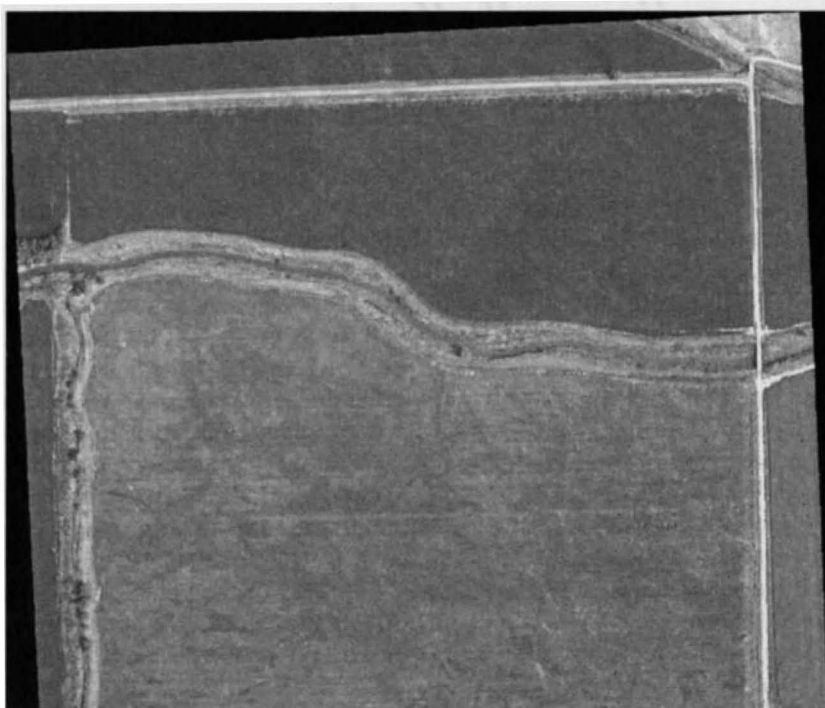
**What Can You Accomplish with Aerial Imagery** with Jerry Mulliken, JM Crop Consulting;

**How to Use Imagery for Remote Sensing of Soil and Plant Properties** with John Shanahan, USDA-ARS, Soil and Water Conser-

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Early season infrared aerial image depicting variability in the soybean field on the north side and a birds-eye view of a nitrogen management study in the southeast corner field. (Photo by JM Crop Consulting)



Aerial image showing extreme field variability in late August in a field near Ashland. (Photo by JM Consulting)

# Crop seminars this winter

A series of University of Nebraska Cooperative Extension programs this winter will provide up-to-date information on a variety of topics of interest to agribusiness professionals and producers. NU's **Integrated Crop Management Winter Programs** will be offered during November and December at several sites across the state. These sessions will provide the opportunity for agribusiness professionals to expand their knowledge base, earn continuing education credit and ultimately increase profits.

The training sessions provide in-depth and detailed information from NU specialists and private industry about crop production, management and diagnostics, soil and water quality, soil fertility and pest management.

Continuing education credits for the Certified Crop Advisor program are being sought for all

## Aerial imagery

(Continued from page 238)

vation Research Unit, Lincoln;

**Looking at Your Farm – What Field Images Revealed in 2003** with Robert Caldwell, UNL, systems analyst; and farmers who used aerial imagery in 2003; and

**What we Learned Using Aerial Photography** with a panel of speakers.

Registration for either workshop must be received by November 20. The registration fee is \$50 for non-NeATA members and \$25 for NeATA members and includes lunch and program materials. For further information or to register contact Dave Varner at 402-727-2775 or email him at [dvarner1@unl.edu](mailto:dvarner1@unl.edu)

Further information about UNL's precision agriculture program and other educational opportunities is available at <http://precisionagriculture.unl.edu> and further information about NEATA is available at <http://www.neata.org/>

classes except where indicated otherwise.

For more information or to register: call (402) 624-8000, e-mail [cdunbar2@unl.edu](mailto:cdunbar2@unl.edu) or visit the Web site at <http://ardc.unl.edu/training.htm>.

Those who register at least one week in advance of programs will receive a discounted rate. Fees include lunch, refreshment breaks, workshop materials and instruction manual.

(More detailed information on these workshop will be included in the next *CropWatch* on Nov. 21.)

## Improving Crop Production Through Microbiology

November 25, NU Agricultural Research and Development Center near Mead

## Soil Fertility Basics

December 8, College Park, Grand Island

\*No CCA credits are being offered for this course.

## Soil Fertility Training

December 9, College Park, Grand Island

## Precision Ag - Major Components (Intermediate Level)

December 10, Lifelong Learning Center, Norfolk

## Precision Ag - Data Management (Advanced Level)

December 15, UNL East Campus, Lincoln

## Crop Pest Management Training

December 17, College Park, Grand Island.

## Nebraska Soybean Expo

The Nebraska Soybean Expo and Machinery Day will be December 12 at the Saunders County Fairgrounds in Wahoo.

Among the program topics will be a discussion of the need to improve soybean protein quality and oil content to stay competitive in the world market.

## Insurance

(Continued from page 237)

Insurance Services.

"I know there have to be a lot of questions," said Art Barnaby, KSU professor of agricultural economics. "We have the absolute best person to answer them — the person who wrote it."

Peter Griffin, president of Applied Analytics Group, Inc. in Chicago, developed cattle insurance contracts and also contracts covering swine, which will be released in November.

"They are a hybrid type of insurance that doesn't follow traditional insurance deals," Barnaby said. "It is really a derivative. LRP has insurance principles but it also has the option for a pricing principle."

Program topics will include: Drought Scenarios for Next Year's Growing Season; Water Rights/Issues – Risk Aspect – What Does This Mean for Farmers/CI Agents; Satellite Imagery and Geospatial Information Used by the Risk Management Agency and USDA; Current Risk Management Issues; Crop Insurance Changes from Washington; Risk Management Educational Program; Understanding the New Livestock Insurance Contract; and Does it Make Sense to Combine Insurance Products While Adding New Products.

Cost for this workshop is \$65 before Nov. 10 and \$90 afterward. The fee includes handouts, lunch and refreshments. For more information or to register for the Nebraska meeting, contact the UNL Agricultural Economics Department, Room 308A Filley Hall, University of Nebraska, Lincoln, Neb. 68583-0922, call (402) 472-2039, fax (402) 472-0776. The sponsors have applied for continuing education credits in insurance.

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# No-till yields persevere even in dry year

Dry weather again put many crops and cropping practices to the test this season. Throughout the state, differences in tillage systems, planting dates, or other management factors made large differences in yield, especially in dryland production. The moisture conservation benefits of crop residue management and no-till helped many fields "hang on" through the dry spells, waiting for precious rainfall while some conventional tilled fields didn't fair as well.

***Long-term no-till treatments have better soil structure, more residue cover, and less surface crusting.***

The 2003 yields for a long-term tillage system study on the University of Nebraska Rogers Memorial Farm (10 miles east of Lincoln) are given in the table. These research plots, established in 1981 in a dryland soybean/grain sorghum

## Tillage System

	Yield, bu/ac*	
	Soybeans	Grain Sorghum
Fall plow, disk, disk	38.2	123.0
Fall chisel, disk	38.3	119.6
Disk, disk	37.0	110.3
Disk	38.6	121.5
No-till with cultivation	41.4	124.2
No-till without cultivation	44.1	128.3

\*Full plot harvest with a combine and weigh wagon; corrected for moisture.

rotation, are showing that long-term no-till builds soil structure, usually has the highest yield, and is the most profitable. After good rainfall last fall, there were adequate rains in May and June to fill the soil profile, replacing the soil moisture lost to preplant tillage. However, little rain fell from June 28 through September 8, only 3.3 inches, and another 3.3 inches fell from then until harvest at the end of September. The late season rains may not have added much to the yield of the grain sorghum as it was near maturity, but

it definitely helped the soybeans fill their pods.

Over the years, it has been observed that the long-term no-till treatments have better soil structure, more residue cover, and less surface crusting. These conditions are improving the water infiltration rate and decreasing runoff, making rainfall more effective with long-term no-till. With no tillage operations, better soil structure, and higher yields, no-till is the most profitable tillage system.

**Paul Jasa, Extension Engineer**

## New NebGuides describe steps to limit soil acidity

Intensive cropping and use of acidifying fertilizers are leading to increased soil acidity problems in some areas of Nebraska. Eventually this can lead to reduced yields. Two recent NU NebGuides present strategies to manage soil acidity.

Soil acidity problems generally develop slowly over many years, depending on soil type and management practices. Increased soil acidity can affect plant growth and gradually affect soil microbial activity. Some nutrients become less available as soils become acid, while other nutrients become more available. Indirect effects on nutrient availability and on the presence of toxic ions such as exchangeable aluminum and manganese are generally more important to crop performance than the direct effect of acidity.

Several tactics can be used to counter the shift to soil acidity, including cultural practices and lime applications. Two new NU Cooperative Extension NebGuides address these tactics in detail:

- **Management Strategies to Reduce the Rate of Soil Acidification** (G03-1503) by Charles Wortmann, NU nutrient management specialist; Martha Mamo, NU soil scientist; and Charles Shapiro, NU crop nutrient specialist, discusses how cultural practices can reduce the rate of soil acidification. It addresses the causes and types of soil acidity; acid forming fertilizers; phosphorus, sulfur, nitrogen and organic fertilizers; crop growth and uptake of nitrogen and basic cations; legumes and nitrogen fixation; leaching of nitrate; and effect of irrigation water. It is available on the Web at <http://www.ianr.unl.edu/pubs/soil/g1503.htm>

[www.ianr.unl.edu/pubs/soil/g1503.htm](http://www.ianr.unl.edu/pubs/soil/g1503.htm)

- **Lime Use for Soil Acidity Management** (G03-1504) discusses how liming can neutralize soil acidity and what factors can affect the economic benefits of liming. It's also written by Mamo, Wortmann, and Shapiro. Sections address: determining lime need, lime quality and materials; lime application; cropping systems and pH threshold; stratification of soil pH; site-specific or variable rate application; and economic issues related to lime applications. It is available on the Web at <http://www.ianr.unl.edu/pubs/soil/g1504.htm>

Both of these publications are available from your local Cooperative Extension office or online on the NU Cooperative Extension publications web site at <http://www.ianr.unl.edu/pubs/>