4-2-1998

CropWatch No. 98-3, April 3, 1998

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

CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 98-3
April 3, 1998

Army cutworms invade western Nebraska

Army cutworms have been reported in spectacular numbers in several areas of the Panhandle and southwest Nebraska. Many reports have been from homeowners seeing "armies" of cutworms on sidewalks and climbing the sides of houses. These cutworms are simply seeking better food sources until the grasses and other plants they usually feed on are available. Cutworms are not expected to cause much damage in these "urban" situations; however, there is a significant threat to alfalfa, sugarbeet, and wheat fields throughout the western half of Nebraska.

Growers in the Nebraska Panhandle already are finding economic populations and severe infestations have been present in southwest Kansas for several weeks. These reports cover a large area, and potentially represent a significant impact on these crops. As crops begin to emerge in western Nebraska in April, growers should watch for damage in alfalfa, winter wheat, and sugar beets.

Army cutworms have been reported in "spectacular numbers" in western Nebraska.

In alfalfa, army cutworms will feed on the newly emerging leaves near the crown. They can be found in the loose soil surrounding the crown of the plant. This feeding will slow or delay alfalfa green-up. Any delay in green-up may indicate a problem and the cause should be determined right away. If enough cutworms are present and feeding is allowed to continue long enough, the plants may die. If alfalfa is able to green up normally the likelihood of significant cutworm damage is significantly lessened.

Scout fields and count the number of larvae per square foot in several areas to determine larval density. For established alfalfa, the economic threshold is four or more army cutworms per square foot. Because the plants have less root reserves, the threshold for newly seeded stands drops to only two larvae per square foot.

In wheat, army cutworms graze on leaves, causing reduced foliage. Significant damage is more likely in fields with minimum foliage (i.e., stressed areas or poor stands). During the day the cutworms bury themselves in the loose soil at the base of the plants and between the rows. In the evening and at night they climb up on the plants to feed. As with alfalfa, scout fields to determine the larval density in larvae per square foot. If the wheat is growing vigorously, four or more cutworms per square foot are needed to cause significant damage. If the wheat is stressed and not growing well, the wheat will not be able to outgrow the cutworm damage. In this case only two cutworms per square foot may cause significant damage.

Damage to sugar beets can be extremely damaging as the larger larvae present later in April or early May move into beet fields, trimming off small beets at the soil line. The growing point of sugar beets is exposed at beet emergence, and cutworm feeding will destroy the growing point and kill these small plants. This damage can progress very rapidly in a field. Careful scouting at plant emergence is important to determine the need for treatment. Populations as low as one cutworm per 20 row feet can cause significant stand loss in sugar

(Continued on page 23)

Inside

Briefs

Field Scout Training dates set for May

Two field scout training sessions have been scheduled for this summer at the following locations:

- North Platte at the West Central Research and Extension Center, May 13, 8:30 a.m.
- Kearney at the Buffalo County Extension Office, May 14, 8:30 a.m.

Future *Crop Watches* will feature additional information.

Ron Seymour, Extension Assistant, Entomology, West Central R&E Center, North Platte

Stevens fills soil fertility position at North Platte

W. Bart Stevens recently joined the staff at the West Central Research and Extension Center (WCREC) at North Platte as a research associate in soil fertility.

Stevens was raised on an irrigated farm/ranch in the Bighorn Basin of northern Wyoming where beef cattle, silage corn, small grains, alfalfa, and sugar beets were raised. He received a B.S. degree in crop science and an M.S. degree in plant nutrition from Brigham Young University, and recently completed a Ph.D. program in soil fertility with Robert Hoeft at the University of Illinois.

At Illinois Stevens researched the effect of different cropping system management practices on fertilizer nitrogen use efficiency. While in North Platte, he will be assuming some of the research and extension responsibilities of Dr. Gary Hergert, who is serving as the interim WCREC District Director.

Stevens can be reached by phone at (308) 532-3611 Ext. 140 or by email at bstevens@unlvm.unl.edu

Wheat Video Conference Aug. 19

Wheat producers should mark their calendars now for the 1998 Growing Wheat Well Video Conference. It is scheduled for 8-10 p.m. on Aug. 19. During the conference, wheat producers across the state will be able to get the latest information on wheat production, from what varieties performed best in 1998 to what to look forward to in 1999.

Register for free materials by calling 1-800-755-7765. *Crop Watch* will feature additional information on the conference in upcoming issues.

Rawlinson joins UNL

Jeff Rawlinson joined the UNL Agronomy Department as an Extension Assistant in Weed Science this winter. A Nebraska native, Rawlinson is pursuing his M.S. degree in agronomy. He researched the restoration of Nebraska Sandhills using warm-season grasses and VAM fungi. He received his B.S. in range management and fish and wildlife management from UNL in 1995.

Rawlinson is working with Extension Weeds Specialist Alex Martin and can be reached at 402-472-1544 or by email at jtr@unlvm.unl.edu.

CROP WATCH

1998 University of Nebraska

Crop Watch is published from March to November by the University of Nebraska Institute of Agriculture and Natural Resources Communications and Information Technology, PO Box 830918, 108 Agricultural Communications Bldg., UNL, Lincoln, NE 68583-0918. To order either a printed or electronic (web) subscription or to change your address, write to ***Crop Watch*** at the above address or call (402) 472-7981. A sample copy of the Web version is available free at *http://www.ianr.unl.edu/cropwatchnews*

Lisa Jasa, Editor
Email: agcm005@unlvm.unl.edu

For more information about a particular subject, write the authors at the addresses below:

UNL Department of Entomology
202 Plant Industry Bldg.
Lincoln, NE 68583-0816

UNL Department of Plant Pathology
406 Plant Science Bldg.
Lincoln, NE 68583-0722

UNL Department of Agronomy
279 Plant Science Bldg.
Lincoln, NE 68583-0918

UNL Department of Agricultural Meteorology
236 L.W. Chase Hall
Lincoln, NE 68583-0728

Army cutworms

(Continued from page 21)

beets. Of the planting time insecticides, only Lorsban 15G will provide reasonable control of these cutworms, and in dry conditions control with Lorsban 15G may not be adequate. The best control options are to monitor the fields and treat with Lorsban 4E where serious cutworm problems have been identified. Cutworm problems in sugar beets are most likely to occur on field edges next to grassy borders or in fields planted to a winter cereal cover crop. These areas should be targeted in scouting efforts.

Larval feeding will continue until the larvae are fully grown. They will then burrow into the soil, create an earthen chamber and pupate. Adults will emerge from the soil in May and early June. Emerging moths often are a nuisance in urban areas as they migrate to the Rocky Mountains for the summer. As they migrate, they often seek shelter around store fronts, garages, bushes and shrubs, feeding on available nectar-bearing, flowering plants. In the fall these moths migrate back to the plains where they deposit their eggs in wheat and alfalfa fields.

Several insecticides are registered for army cutworm control in wheat and alfalfa. As with other cutworms the most effective insecticides are the synthetic pyrethroids. These include Ambush, Pounce, Baythroid, and Warrior for alfalfa and Warrior for wheat. Also, Lorsban provides good control of cutworms in both alfalfa and wheat. Always follow all application instructions and safety precautions on the pesticide label. Further information describing the life cycle and management of the army cutworm is in NebGuide G93-1145, *Management of the Army Cutworm and Pale Western Cutworm*, available at Cooperative Extension offices.

Gary Hein
Extension Entomologist
Panhandle R&E Center, Scottsbluff

Begin scouting wheat fields; be alert to leaf rust potential

In between March snow storms, I was able to sneak in a couple of wheat surveys in eastern Nebraska. Most fields looked green and healthy. Hopefully, they were covered with snow before the subzero wind chills.

Septoria tritici leaf blotch was the most common disease. The lesions on the leaves were from last fall's infections. They are yellow to brown blotches with small black specks dotting the surface of each blotch. This disease, although common early in the growing season, usually doesn't present a serious threat to Nebraska wheat.

Leaf rust and tan spot are our most important leaf diseases. Kansas, Oklahoma and Texas reported the presence of leaf rust in early March. Since we get our rust inoculum from these states, disease development in those three states bears watching during April and early May. Our most rust susceptible varieties in Nebraska include Alliance, Karl/Karl 92, Siouxland and TAM107. Usually, rust is only a problem east of Highway 83.

The best solution to combat disease problems is to scout wheat fields regularly beginning in April. With some diseases such as leaf rust and tan spot, early detection can be beneficial if fungicides are to be used as a control measure.

Wheat soilborne mosaic will become evident in April as large light green areas in fields. The most prominent symptoms are in low areas such as terrace channels and the edges of waterways. Continuous wheat aggravates the severity and when combined with a susceptible variety, losses can be substantial. Symptoms can be confused with nitrogen deficiency. For an accurate diagnosis examine individual plants for the mosaic pattern.

While soilborne mosaic symptoms are most evident between 50°F and 70°F, wheat streak mosaic symptoms are most evident later in spring when temperatures remain above 70°F.

Wheat streak mosaic was our most serious wheat disease in the Panhandle and west central Nebraska. There was ample hail and volunteer wheat last June, which often sets the stage for localized epidemics of wheat streak. Unless it was destroyed last summer, the volunteer wheat may have served as the summer host for the wheat streak mosaic virus and its mite vector. Not only is wheat streak serious enough by itself, we are now finding it more frequently in combination with the High Plains virus. Wheat streak alone usually doesn't kill plants, but the combination of viruses is deadly.

I will conduct additional wheat surveys in early April to determine the condition of the crop and to look for crown and root rot. Early planted fields or those with soft seedbeds are prime candidates for crown and root rot development. Infected plants will be stunted, yellowed and the roots and crowns discolored. Since there was good fall moisture, crown and root rot may not be severe this spring.

The best strategy is to scout wheat fields regularly beginning in April and plan your response.

John Watkins
Extension Plant Pathologist

Nebraska ranked 6th nationally in winter wheat production with 70,300,000 bushels in 1997.

Assess alfalfa stands in time for replanting

Usually alfalfa leaves winter in pretty good shape, however, fields which entered winter in a weakened condition may suffer some losses.

Evaluate stands early this spring. Older, dryland fields need 40 shoots per square foot from two or three plants for maximum yields. Very productive sites, such as irrigated and sub-irrigated fields, should have at least 55 shoots per square foot from 4 to 6 plants. About one-tenth of a ton in yield potential is lost for every shoot below these numbers.

New fields may need to be planted if dryland alfalfa is thinner than 30 shoots or if irrigated alfalfa is thinner than 40 shoots per square foot. Check for these densities in several areas of your fields when the early shoots are 6 inches tall. Since some shoots begin growing later than others, stands with enough plants but slightly low shoot density may be all right, especially if shoot height and distribution is fairly uniform. If plant density is low, or shoot growth is not uniform, yields probably will be lowered.

Bruce Anderson, Extension Forage Specialist, Lincoln

Early crop conditions

Winter wheat condition rated higher than a year ago with 1% very poor, 5% poor, 20% fair, 56% good and 18% excellent, according to the Nebraska Agricultural Statistics Service Report issued Monday. The crop was beginning to come out of dormancy with limited winterkill reported.

Oat seeding was 6% complete. Seeding was most advanced in the Panhandle with 22% sown as of Sunday.

Sugar beet field preparations had begun in the Panhandle.

Weed control in wheat requires multi-factor plan

A good weed control program in winter wheat includes crop and fallow weed control as well as supportive cultural practices to make the crop more competitive with weeds. Such practices include variety selection, planting date, planting rate, row spacing, fertilizer program, disease and insect control. Following are several herbicide treatments for use in winter wheat. For more information see the weed response chart on page 44 of the *1998 Herbicide Use Guide*, EC98-130-D. Adding liquid nitrogen may considerably reduce crop safety for some treatments.

2,4-D amine or ester 2,4-D is an effective and economical treatment that controls many broadleaf weeds. It has shown poor activity on erect knotweed largely because sprayings are done too late, and it will not control wild buckwheat. Weeds should be treated early in their development for optimum control, however, crop growth stages must dictate the appropriate time for 2,4-D application. Winter wheat must be well tillered but not jointed to avoid significant crop injury. Early spring treatments are generally best because the crop is in the proper growth stages for 2,4-D use. Ester formulations may provide greater weed control but also may injure winter wheat more readily. Both formulations of 2,4-D will persist in soil about two to four weeks and will provide little residual activity. Use rates for wheat are 0.5-0.75 lb a.i./acre (1-1.5 pt with 4 lb/gallons a.i.) with amine formulations and 0.25-0.38 lb a.i./acre (1/2 to 3/4 pt with 4 lb/gallon a.i.) with ester formulations. (Approximate cost is $0.85-$2.00 an acre.) With ester formulations use the Low Vol to reduce movement of the fumes from the field.

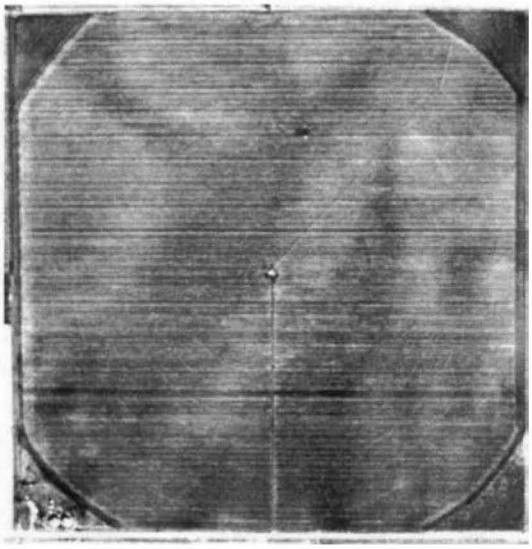
2,4-D + Buctril (Moxy). The active ingredient in Buctril is bromoxynil which provides effective control of most broadleaf weeds if application is timely. Bromoxynil acts primarily as a contact herbicide — thorough spray coverage is essential. Weeds should be small at the time of treatment — two to four leaves or rosettes about 2 inches in diameter. Bromoxynil will not injure winter wheat or winter barley when applied at the two-leaf to boot stage, making fall application possible if applied alone. Applications made after the canopy covers the weeds are ineffective because of the contact herbicide. Bromoxynil has no residual activity in soil and is expensive to apply when compared with 2,4-D. It should be used in combination with 2,4-D. Use rates of Buctril are 0.25 to 0.375 lb a.i./acre (1 to 1.5 pt 2EC) + 8 oz 2,4-D amine. (Approximate cost is $7-$10.50 an acre.)

2,4-D + Ally. (Use Ally only in tank mixes with other broadleaf herbicides.) Metsulfuron is closely related to chlosulfuron (Glean) and is sold under the trade name Ally. Ally has greater postemergence activity than Glean but provides shorter residual weed control — approximately four weeks. Ally in tank mixes with other broadleaf herbicides can be applied from the fully tillered to the joint stage without crop injury. Use Ally not more than every other year on a given field. First choice for tank mix is 2,4-D LV ester at 8 oz based on 4 lb/gal a.i. plus 1 pint of surfactant/100 gallons of spray solution. Other tank mix partners are Buctril 2EC, 1/2-1 1/2 pts; Bronate, 1/2-2 pts; Banvel, 1 to 4 oz (reduced weed

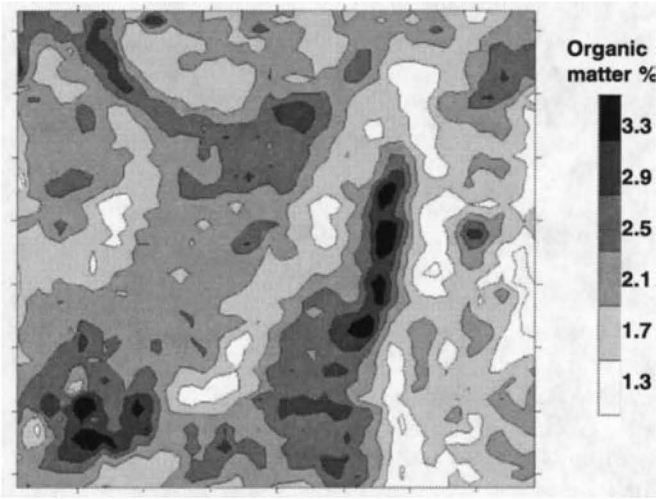
(Continued on page 26)

Precision farming

Bare soil imagery helps link our view of the land with yield maps and soil sample data



Bare soil image. Note how well the differences in shading correspond to the organic matter map below. Horizontal lines indicate field rows.



Soil organic matter map for the same area as the bare soil image. Map information is based on intensive soil sampling. Note how the darkest patterns in the soil image correspond to the highest organic matter. Note also how quickly organic matter can change from one place to the next — features that are lost in many soil sampling schemes.

Soil conditions vary from field to field and site to site within fields. Traditionally we have sampled soils in blocks of tens of acres. Now with global positioning systems we can analyze samples characterizing as little as 2.5 acres. Even in that smaller area, there is still a lot of soil variability. Can we do better? Is there a way to analyze our soils in more detail?

Bare soil imagery is one approach being developed by researchers. A good aerial photograph can identify patterns of basic soil fertility that might be missed when looking at data from soil samples alone. Close examination of bare soil photos can provide a basis for interpreting and applying soil sample data. The aerial photo can be digitized and used in current software to provide a more familiar base with which to compare maps of yield, organic matter and other characteristics.

Bare soil images are valuable because:

• Features in the images correspond to important management variables. Organic matter, for example, is correlated with image color. Compare the bare soil image at the left to the map of soil organic matter below it and note how well their patterns match.

• Image color is sensitive to topsoil moisture, which reflects the water holding capacity and drainage characteristics of the profile.

• Patterns change little with time. A good image can be used for years.

• The images have a high resolution. When digitized, each pixel — the individual dots that combine to form the picture — covers as little as a fraction of a square foot.

• Expensive equipment is not required to take the photos. Regular color film can be used in a consumer grade camera, and the pictures can be taken hand-held from the window of a single-engine aircraft.

If you are interested in obtaining bare soil images for your farm, consider these recommendations:

•The quality of the photo depends on lighting. Shoot pictures between 10 a.m. and 2 p.m. on a clear day. Cloud shadows can interfere with image analysis.

• Topsoil moisture and residue cover are important. For best contrast, take the image after a 1/4" inch rain soon after planting.

• Wide-angle lenses allow for pictures at lower altitudes, but distort the images. Lenses with focal lengths

(Continued on page 26)

Bare soil photography

(Continued from page 25)

above 28mm are recommended.

• Shoot straight down. Photos shot at an angle may show topography better, but they will be harder to match up with data maps.

• Color infrared film is not recommended. Soils do not show special features in the near infrared spectrum.

Eventually the bare soil photos should be rectified and georeferenced, so they match with latitude and longitude. This allows the images to be used in a geographical information system (GIS). Yield maps and soil sampling data can then be viewed on top of the soil image to look for relationships. Specialized software with commercial GIS systems can rectify and georeference the images. If processed with care, the digitized bare soil images can become a good base for your precision farming.

Jim Schepers, Research Leader
USDA/ARS Soil and Water Conservation Research Unit, Lincoln
Robert Caldwell, Extension Cropping Systems Specialist

NRD tree delivery begins in mid April

The Nebraska Conservation Tree Program will start shipping individual orders April 13-17. Individuals who have ordered trees and planting through their local Natural Resources District may be contacted this week. Proper handling and care of the seedlings are essential for successful tree planting.

Bill Lovett
Nebraska Forest Service

Weed control in wheat

(Continued from page 24)

control may occur with the Banvel mix due to occasional antagonism); Curtail, 1-2 pt; and MCPA, 8-16 oz. Do not use in fallow. Check labels for these and other rates plus the need for surfactants. Although Ally does not have the residual activity of Glean, there are rotational restrictions that should be considered before using Ally. Dryland corn, sorghum or proso millet should not be planted for 10 months on soil with pH 7.5 or less. Corn, safflower, or sunflower should not be planted for 22 months after application of Ally in soils with pH 7.6 to 7.9. At the lower tank mix rates surfactant must be added at 1 qt/100 gallon of spray solution. The use rate is 0.06 oz a.i./acre (1/10 oz product) plus tank mix partner. (Approximate cost is $2.50-$3.00/acre.)

2,4-D + Amber. (Use Amber only in tank mixes with other broadleaf herbicides.) Amber is one of the sulfonylurea herbicides and can be tank mixed with several herbicides. Add surfactant if weeds are present at spraying. Check on rotational restrictions. Amber rates are 0.28 to 0.56 oz + 1/4 to 1/2 pt of 2,4-D LVE applied from early spring in tiller to joint stage. Amber by itself can also be applied in the fall after the two-leaf stage of winter wheat. (Approximate cost is $2.50-$5.25/acre.)

2,4-D + Finesse. (Use Finesse only in tank mixes with other broadleaf herbicides.) Finesse is one of the suylfonylurea herbicides and can be tank mixed with several herbicides. Use rates are 0.2 to 0.3 oz plus 1/4 to 1/2 pt 2,4-D. Add surfactant to the spray solution. Use on tillered wheat up to the joint stage. Check label for rotation restrictions. (Approximate cost is $2.75-$4.25/acre.)

2,4-D + Peak. (Use Peak only in tank mixes with other broadleaf herbicides.). Peak is one of the suyflonylurea herbicides and can be tank mixed with several herbicides. Peak + 2,4-D can be applied from early spring in tiller to joint stages. Peak has a shorter residual than some of the suylfonylurea herbicides. Check rotation restrictions. (Approximate cost is $3-$6/acre.)

2,4-D + Harmony. Because of the cost, this should be considered only in double crop systems. (Approximate cost is $4.25-$6.50/acre.)

2,4-D + Banvel. A tank mix of 2,4-D plus Banvel (dicamba) can be applied to control weeds tolerant to 2,4-D. This treatment will control most problem broadleaves though blue mustard may be more effectively controlled with 2,4-D alone. Application must be made to well tillered winter wheat and before the jointing stage to avoid crop injury. The risk of crop injury with this tank mix is high; weed control benefits may be offset by yield reduction if proper application timing is not observed. Residual weed control with 2,4-D + Banvel is moderate with soil persistence of four to eight weeks. Use rates are 0.06 to 0.09 lb a.i./acre (2 to 3 oz) Banvel + 0.25 to 0.375 lb a.i./acre (8 to 12 oz) 2,4-D amine. (Approximate cost is $1.80-$2.80/acre).

2,4-D + Tordon. Apply after resumption of active growth in the spring with at least four tillers until the early joint stage. Use rates are 1/2 to 3/4 pt 2,4-D LV ester plus 1 to 1 1/2 fl oz Tordon. Use only on fields that will be planted the following year to grass, barley, oats, wheat or fallowed. (Approximate cost is $1.50-$2.35/acre.)

Curtail. Apply after crop begins tillering to before boot stage. Use rate is 2 pints per acre. It is effective on Canada thistle. Do not rotate to any crops for one year after treatment except for wheat, barley, oats, and grasses. (Approximate cost is $8.50/acre.)

MCPA is also labeled for wheat and is best combined with other herbicides.

Robert N. Klein, Extension Cropping Systems Specialist, West Central R&E Center, North Platte

Variable rate fertilizer application: *Technology makes it possible, but is it what you need?*

The availability of equipment capable of variable rate fertilization is gradually increasing in Nebraska. This equipment allows producers to use fertilizers more efficiently, potentially increasing profit while protecting water quality. The problem is that we don't yet know, in many cases, the most appropriate strategy for variable rate fertilization. Should fertilizer rates be higher in areas of low yield to increase yield potential, or should rates be lower because factors other than fertility limit yield in those areas, and extra fertilizer would be wasted? In general, the technology which allows us to vary fertilizer rates is ahead of our agronomic understanding of when we should vary rates.

This should not discourage Nebraska producers from considering variable rate fertilization on a trial basis. Producers should consider beginning slowly, on a field with known or suspected variability, and have an evaluation plan in mind. Several suggestions for producers have emerged from our research in variable rate fertilization over the last five years.

Consider which nutrients to vary. In Nebraska, phosphorus and lime are soil amendments which seem to be the most likely candidates for variable rate application. The presence of farmsteads with livestock is often evident when maps of phosphorus levels are developed from grid soil sampling. Old feedyards and adjacent areas of manure application can result in highly variable phosphorus levels in fields. In grid sampling fields for soil pH, we have found levels which may vary by two pH units or more, for example, from pH 5.2 to 7.1. Given the relatively high cost per acre for lime application in much of Nebraska, and the fact that an ag lime application may last six to eight years, variable lime application may be quite attractive economically. Potassium levels for most Nebraska soils are quite high and non-limiting for most crops. The strategy for varying nitrogen may ultimately be based on crop response during the growing season, rather than on a predetermined map.

Our research in Nebraska with variable rate nitrogen has found little difference in the total amount of nitrogen used or in grain yield, with some trends towards increased nitrogen use efficiency and reduced soil residual nitrate compared to uniform nitrogen application.

The application map. The primary method for developing variable rate fertilizer maps has been grid soil sampling. This is a labor-intensive, costly approach, but if done correctly will provide a map good for several years, upon which non-mobile nutrient application can be based. We have found in our research that the grid density required for an accurate map varies with the nutrient and field. We recommend a grid density of one sample per acre to insure an accurate map. Future variable rate fertilization may be based on yield maps or remotely sensed images. However, basing variable rate fertilization solely on these sources of spatial information is risky until we better understand the relationships between nutrient needs and these layers of information.

Critical levels still apply. Critical levels for nutrients, such as phosphorus, potassium, zinc, etc., developed through years of research are still valid for variable rate fertilization. These levels can serve as the criteria for deciding if supplemental fertilizer is needed in an area of a field. If all of the field is already above the critical level for a specific nutrient, there is no point in applying the nutrient to start with, let alone using variable rate application.

Begin yield mapping when possible. A yield map is probably the most meaningful and easily obtained layer of spatial information for most Nebraska producers. With one or preferably several years of yield maps from a field, the producer can begin to see what patterns exist, how persistent they are, and begin to investigate causes of low and high yield. Low yielding areas are not necessarily low in fertility. Many factors influence yield potential besides soil fertility. If an area is low and regularly ponds water, for example, yields will be lower — at least in wet years. Because of reduced yield in such areas, crop nutrient removal will be less, and soil test values for some nutrients may actually be higher than the field average. Yield maps will allow producers to begin to selectively sample and evaluate areas of the field to determine if soil fertility is a factor in either low or high yielding areas.

Have an evaluation plan. Accurately assessing the impact of variable rate fertilization is challenging even in a detailed research study. However, there are some things producers can do, particularly with a yield monitor, which can give some idea if variable rate fertilization has been helpful.

A yield map from one or more years prior to variable rate fertilization can be compared to yield maps from one or more years after variable rate fertilization. Remember that many other factors will affect yield, and thus yield patterns, besides fertility. Producers may want to include check strips where fertilizer is applied uniformly or not applied at all. Yield differences in these check strips can help determine if the crop is responding to fertilization, and if variable rate fertilization is effective. Remotely sensed images can serve in much the same way as yield maps, and may show differences in crop response to check strips in the field.

Richard B. Ferguson
Associate Professor of Agronomy

Proper adjustments for angled closing wheels

The angled closing wheels used on John Deere, Kinze, and some White planters can provide good seed-to-soil contact when adjusted properly. However, producers often misadjust them when trying to close the seed furrow or when planting shallow. Understanding how these wheels were designed to function can help you better use them.

If the angled press wheels were extended downward, they would intersect at an imaginary point about 1 3/4 inches below the soil surface. This provides pressure on the sides of the seed furrow to collapse the soil around the seed, fracturing the sidewall and providing seed-to-soil contact at planting depths of 1 1/2 to 2 inches. Seedlings can emerge easily because the wheels were not designed to pack the soil above the seed or close the seed furrow tight. Unfortunately, many producers overtighten the downpressure springs on the wheels when trying to close the seed furrow.

When adjusting the wheels, producers must evaluate seed-to-soil contact at seeding depth, not whether the top of the seed furrow is closed. If the seed is in firm contact with the soil, the downpressure springs should not be tightened. Something else, such as a harrow behind the planter, should be used to close the seed furrow. If the springs are tightened, the soil around the seed can be overpacked, creating sidewall compaction at the press wheels. This makes it difficult for roots to penetrate the soil and for seedlings to emerge. Also, when planting in wet conditions where it is easy to establish seed-to-soil contact, reduce downpressure on the press wheels to prevent overpacking.

If the planter is properly leveled or operated slightly tail-down, the angled wheels have a pinching action to close the seed furrow. Too many planters are operated nose-down, particularly in ridge-plant when the tractor's wheels are in the furrow. In addition, the nose-down position removes downpressure from the press wheels. Producers need to level the planter in the field and re-level it as planting conditions or ridge height changes.

When using angled press wheels, the seeding depth should be at least 1 1/2 inches for all crops, preferably 2 inches for corn. Too many producers plant at 1 inch which is shallower than the area firmed by the angled closing wheels. This creates compaction below the seed, making root development difficult. The pressure below the seed can even "bubble up" the seed between the wheels in soft soil when planting at a shallow depth. The angled wheels are not very effective at closing a shallow seed furrow, especially in firm soil, and other options are available for shallow planting.

John Deere had a 1x10 seed press wheel with covering disks or drag knives available on the Max-Emerge for shallow planting and has a pair of covering disks with a wider press wheel for the Max-Emerge II. White has spacer washers on their angled press wheels to change the point of intersection below the soil surface to match planting depth. Deere and Kinze also have that as an option but few producers take the time to move the spacer washers when changing planting depth. For shallow planting, several other press wheels and after-market attachments are available for use on these or other planters.

Paul Jasa, Extension Engineer
Biological Systems Engineering

Weed tour offers up-close look at University herbicide trials

The 1998 Nebraska Weed Tour, which begins in western Nebraska this year, lets participants view University research herbicide trials. While most participants are from the agricultural chemical industry, the tour is free and open to the public. Individuals may attend all or any part of it. The itinerary is:

Wednesday — June 7
3:00 p.m. (MDT), Sidney, High Plains Agricultural Laboratory

Thursday — June 8
8:30 a.m. (MDT), Scottsbluff, Panhandle R&E Center

Monday — June 22
9:00 a.m, Lincoln, Havelock Research Farm

Tuesday — June 23
8:30 a.m., Clay Center, South Central R&E Center

Wednesday — June 24
9:00 a.m., North Platte, West Central R&E Center

Roundup Ready corn — how should I integrate it?

In 1996, Monsanto released Roundup Ready soybeans, a genetically altered version which allows Roundup to be used over the plant without injuring it.

This year five to six corn hybrids feature this technology and seed will be available to plant 500,000 to one million acres in the United States.

When using these new hybrids from DeKalb, apply Roundup from corn emergence through 24-inch height or V-6 growth stage or when weeds are less than 4 inches. Roundup will provide broad-spectrum control of emerged weeds.

While the new genetically altered hybrids provide some new opportunities, they are not a substitute for good weed management.

For maximum weed control and efficiency, a residual herbicide followed by 1.5-2 pints of Roundup two to three weeks after emergence is recommended. Remember that Roundup provides no residual control.

Roundup will be labeled for only one postemergence treatment in corn. Residual preemergence herbicides and cultivation will probably be needed to combat early emerging weeds. Applying a single postemergence application too early could limit weed control. Using a residual preemergence treatment and a postemergence Roundup application will also help control weeds such as waterhemp and nightshade that germinate over an extended time.

There has been some concern that herbicide resistant hybrids have exhibited a yield lag. Yields may be somewhat lower than with normal varieties because of the way resistant crops are developed. After transgenic corn plants with Roundup resistance are developed, they must be backcrossed to an elite line for several generations. This insures the resistant crop contains the high yield and growth characteristics of the current elite hybrid before it hits the market. However, this backcrossing takes several years, while the elite hybrid may be continuing to undergo breeding for further improvements.

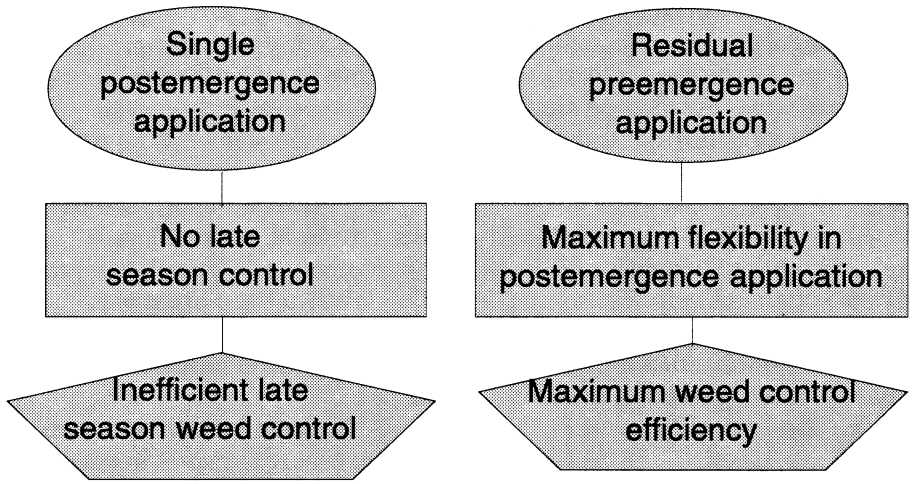
When a transgenic crop is first released to producers, it may more closely resemble the yields of elite crops of three to four years ago rather than that of the current hybrids.

As always, selecting the right hybrid for specific growing conditions is the grower's priority. Roundup resistance is just one of many traits to be considered when selecting seed.

Finally, as we have seen happen with other herbicides, weed resistance and species shift is of some concern with Roundup. While true weed resistance to Roundup may not be likely, species shift is. Users should combine other modes of action and control efforts (such as cultivation and crop rotation) to prevent this.

Jeff Rawlinson, Extension Assistant, Weed Science
Alex Martin, Extension Weeds Specialist, Lincoln

Roundup Ready corn:
two management scenarios



Flow chart of weed management options with Roundup Ready corn. Use of a residual preemergence herbicide with a postemergence application of Roundup is the more efficient option.

Next week: Much more on corn as our special focus continues with early season insect control, specialty corns, planter attachments, and much more.

Got a bug or a diseased leaf? Send them packing for a cure

Careful sampling and packaging of samples can help insure that those sent to the University of Nebraska Plant and Pest Diagnostic Clinic will arrive in condition for better diagnosis. The charge for the service will be the same as last year — $5 for visual/microscope identification, $10 for culturing, and $20 for advanced assays including ELISA tests.

The first step in diagnosis is to consult your local extension educator who often can help with a diagnosis. They also will have a specimen identification form to use when submitting samples to the Clinic. These should be sent to:

Plant & Pest Diagnostic Clinic
448 Plant Sciences Hall
University of Nebraska
P.O. Box 830722
Lincoln, NE 68583-0722
(402) 472-2559

When submitting a sample, please include some basic information, including:

1) history of the problem area (i.e. planting date, location, cultural practices, changes in environment, and when symptoms occurred);

2) name and variety/hybrid (if known) of the host plant, and

3) other pertinent information that might be useful in diagnosing the problem.

Packaging your sample or specimen to arrive in good condition will speed up diagnosis. Following are some tips on preparing and sending your sample:

1) Please don't just send dead plant material. Often a single symptomatic tree branch or a grass plug taken at the margin of a problem area is sufficient to provide both healthy and problematic tissues.

2) Package your sample carefully to ensure it arrives in good condition.

3) Ship samples early in the week (no later than Thursday morning) so they don't spend the weekend in the post office. Such packages can provide some "special" treats when we open them.

4) Remove any moisture from the sample and do not add water.

5) If possible send the entire plant. The symptoms may be above ground but the cause below ground. When sending plant leaves, please send several healthy and several abnormal leaves. (One is not enough).

6) Place the samples loosely in a plastic bag before packaging for shipping. If roots are in soil, enclose them, with soil intact, in a separate plastic bag.

7) When collecting samples in the field, place them in a cooler with ice rather than on the dashboard of the pickup.

8) A photograph of the field, lawn, shrub, or tree accompanying the sample gives us a look at the overall symptom pattern. Along with good background information, this photograph can help in diagnosis.

Insect specimens and plant identification samples are handled differently. If you are sending an insect specimen for identification, please package the specimen in a rigid container. Insect larvae and tiny insects should be placed in a sealed bottle with a preservative such as alcohol. (Rubbing alcohol works great since it is 70% alcohol.) Place live insects in a ventilated container with a paper towel.

Wrap plants being submitted for identification in absorbent paper toweling and place in a loose plastic bag. Specimens shipped loose in boxes will dry out, shrivel and break, up which makes identification difficult. Include a complete sample of roots, stems, leaves, flowers, and fruits when possible. It is also a good idea to keep a sample for yourself so that you know what was identified (photographs are great records).

All of us at the Plant and Pest Diagnostic Clinic look forward to serving you this summer. Hopefully, your plant and insect problems will be few.

Loren J. Giesler, Coordinator
Plant and Pest Diagnostic Clinic

Soil temperature (For week ending March 29)

At 4 inches	*Avg.*	*Norm.*	*Diff.*
Ainsworth	47.6	46.5	1.1
Alliance	45.6	46.3	-0.7
Beatrice	48.5	49.8	-1.3
Concord	43.5	47.1	-3.6
Elgin	46.4	47.3	-0.9
Holdrege	47.5	48.8	-1.3
McCook	50.4	48.4	2.1
Mead	46.4	49.3	-2.9
North Platte	49.1	47.9	1.3
Ord	48.9	48.0	0.9
Red Cloud	51.6	48.8	2.8
Scottsbluff	48.3	46.5	1.8
Sidney	48.6	46.6	2.1
York	46.4	48.6	-2.2