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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2003-4
April 4, 2003

Conserve valuable soil moisture with no-till

Using no-till or ridge-till can save you far more than fuel, labor, and equipment costs. The savings in soil moisture can be just as important, especially in a year when soil moisture and precipitation are limited or when irrigation is costly and water supplies are limited.

Too often the soil will dry to the depth of tillage. An average silt loam soil can hold about 2 inches of available soil moisture per foot of soil. Tilling 6 inches deep and allowing the soil to dry to the depth of tillage could result in a loss of up to 1 inch of soil moisture with each trip. Shallower tillage, even row crop cultivation, can still result in moisture losses of about ½ inch. By not tilling or cultivating, you can minimize these moisture losses.

Greater yet are the soil moisture losses from evaporation once tillage destroys residue cover. The residue mulch reduces evaporation in several ways: by reducing solar heating of the soil, by keeping drying winds off the soil surface, by insulating the soil to keep it cooler, and by intercepting some of the water as it evaporates. Research has shown that the residue mulch can reduce water losses from evaporation by as much as 3 inches during the season.

No-till protects the soil surface with crop residue, reducing erosion and crusting. The residue acts as a mulch to reduce evaporation and keeps the soil surface cooler. In drought conditions, unprotected soils may be too hot and dry for proper root development.

While flattened residue makes a better mulch, standing residue is preferred in crop production. Any residue that is standing up and still anchored to the soil is more effective in keeping the wind off the soil surface, reducing wind blown soil losses and the dust storms common in the spring. In addition, anchored standing residue doesn't have to be cut or handled during subsequent field operations and is far less likely to move with the wind,

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Inside

Techniques for achieving early season weed control in corn

Warm weather this week across much of the state has been tempting producers to get a jump on planting corn. Of course, the warm weather means weeds can't be far behind, especially the early germinators like lambsquarters, giant foxtail, velvetleaf, and sunflower.

Choosing an effective herbicide strategy is not always an easy task. Producers need to consider many aspects, including economics such as herbicide costs, fuel and time, and biological and environmental factors such as weed species spectrum, soil type, organic matter, herbicide efficacy, herbicide restrictions, annual precipitation, precipitation at application, and the ability to make a timely treatment application. Even when all of these factors are considered, often there is still no perfect choice.

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EPA grants special pesticide registrations for 2003

The Environmental Protection Agency recently granted requests from the Nebraska Department of Agriculture to use the following products in Nebraska for this growing season:

Section 18 registration for using Spartan (broadleaf herbicide) in chickpeas, March 27-July 1;

Section 18 registration for using Spartan (broadleaf herbicide) in potatoes, effective April 10-June 30;

Section 18 registration for using Spartan (broadleaf herbicide) in sunflowers, effective April 1- July 1;

Section 18 registration for using Outlook (herbicide) in sugarbeets, effective April 10 - July 31;

Section 18 registration for using Checkmite on bee hives; effective March 17 - Dec. 31

A request also has been filed for the use of Eminent on sugarbeets.

Rich Reiman, administrator of NDA's Plant Industry Division, reminded producers that they must have a Section 18 label in their possession at the time of use. If applicable, contact the Nebraska Department of Agriculture for a permit to distribute any of these products.

Updates

Wheat disease

With wheat just resuming growth in Nebraska, there is little disease activity. Surveys will be conducted later this month and during May to determine which diseases are active and their incidence and severity. What I can report on now is the status of leaf and stripe rusts in Texas. If you remember stripe rust was widespread and damaging in the southern and central plains including Nebraska in 2000 and 2001 and leaf rust was moderately severe in 2002.

The following information is based on the most recent update from the USDA's Cereal Disease Lab. In mid-February they reported light amounts of leaf rust in central Texas. Cool temperatures restricted leaf rust development, so the situation had not changed by early March.

By mid-February there were several hot spots of stripe rust in central Texas and by early March stripe rust was spreading in that area. When this disease occurred in Nebraska in 2001, the varieties 2137 and Lakin showed the highest rust severities. The northward progression of both rusts will be monitored as our growing season begins. Critical factors that will determine if we will have problems are how rapidly these rusts build up in Texas, Oklahoma and Kansas, a pattern of southerly winds that blow rust spores north and our May and early June weather once rust reaches Nebraska.

John Watkins
Extension Plant Pathologist

IANR listening sessions begin

UNL's Institute of Agriculture and Natural Resources is conducting listening sessions across the state to receive valuable input from its users as IANR revises its strategic plan. This effort is being led by Dr. Alan Baquet, IANR Associate Vice-Chancellor.

Listening sessions will continued at various sites up to April 16. Visit the web site listed below for specific locations and times or contact your local Cooperative Extension office. If you're planning to attend one of the sessions, please contact the host listed with the meeting information so appropriate arrangements can be made for seating and refreshments. If you are unable to attend a session, you can provide input on IANR priorities and programs online at *http://ianrlisten.unl.edu/*

This site lists six questions to which you can respond:

1. What do you most value from IANR?
2. How can we increase the relevancy of our programs for you?
3. What is the best way to disseminate information from IANR for your use?
4. What current programs if they were to diminish or disappear would have the most serious consequences for you, your family, your business, or your community?
5. What programs do you think can be retired or let go of?
6. What are the most significant issues on the horizon that will affect you, your family, your business, or your community?

CROP WATCH

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No-till conserves moisture *(Continued from page 31)*

surface water runoff, or during furrow irrigation. Unlike a flattened mat of residue which may keep the soil surface too cold and wet for planting, the air movement among the standing residue allows more timely field operations while maintaining the benefits of the residue.

Some say the soil needs to be tilled to "open it up to let water in". Unfortunately it dries to the depth of tillage so the initial water let into the soil just replaces what was lost rather than adding to the soil moisture reserve. Tillage breaks up and pulverizes the soil surface, making the soil prone to crusting from raindrop impact. Tillage actually creates a condition that seals the soil, resulting in more runoff and less effective rainfall or irrigation.

Tillage also destroys the residue cover that protects the soil from raindrop impact, reducing erosion and crusting of the soil and allowing more rainfall to soak in. The residue also slows water runoff allowing time for infiltration and acts as a mulch to reduce moisture evaporation from the soil.

Some people recommend tillage for herbicide incorporation for better weed control. While very shallow tillage with good soil mixing may help weed control, it also dries the soil and "plants" weed seeds. Deeper tillage dilutes the herbicide with more soil and dries the soil even more. Rainfall will incorporate herbicides more uniformly than a tillage operation, provided the herbicide label allows it and the herbicide is applied early enough to receive adequate rainfall. Usually there is enough rain in early April to activate an early preplant preemergence herbicide; however the chances diminish by waiting until late April or until after planting when weeds may have already started growing.

Higher fuel costs — about 30% more this year — also are a factor when considering tillage. The diesel fuel requirements for the typical disk-disk-field cultivate tillage system is about 3.77 gallons per acre including knifing in fertilizer, planting, and one row crop cultivation. By switching to a no-till system, the fuel use decreases to about 1.43 gallons per acre including knifing in fertilizer, planting, and two sprayings. By eliminating preplant tillage, labor requirements decrease and there is improved timeliness of planting.

Paul Jasa
Extension Engineer

Potential nitrogen volatilization in no-till studied

The following article from South Dakota State University was recommended by Charles Shapiro, NU soils scientist -- crop nutrition at the Haskell Ag Lab at Concord. See CropWatch online for a table and graphic illustrating these results.

Surface application of urea is a common practice used by no-till farmers. Because the urea is left on the soil surface, there have been many questions as to how much nitrogen could be lost to volatilization (ammonia loss from urea converting to ammonium). The urease enzyme is required for this conversion and is abundant on crop residues. Since a lot of crop residue is present with no-till, there could be greater nitrogen loss from volatilization as compared to tilled soils.

When urea is applied to the soil surface, the fertilizer granules often disappear without a significant precipitation event. Very small amounts of water (even moisture absorbed from the air) will dissolve the urea granule. Just because the granules disappear doesn't mean the nitrogen is lost. The urea is still present but in a sense has melted onto the soil surface and is more prone to hydrolysis than if it were still in the granule form. If significant precipitation (usually regarded as more than 0.25 inch) is received to move the urea into the soil, enough soil particles are present to lessen ammonia loss.

Because the urea to ammonia conversion is an enzymatic reaction, the rate of conversion is greater at warmer temperatures. Since soil temperatures are much lower during the late fall, surface applications of urea have been recommended. However, fall and winter months usually have lower precipitation and the urea is more likely to lie on the surface longer than when applied in the spring.

Urea application timing studies were conducted on no-till corn in eastern South Dakota in 1998, 1999, 2000 and 2002. Surface applied urea was applied as per the timing treatments. For each application timing two rates of nitrogen (50 and 100 lbs N/a) were applied. A check plot without nitrogen also was included. The average data from the four years are presented.

Nitrogen rate significantly influenced average grain yield over the four years and yield increased with each level. Application time also significantly influenced grain yield. Average grain yields from the late fall and winter applications were significantly lower than the planting and V6 timings. Loss of nitrate-N to leaching does not appear to be a contributing factor because departures from average precipitation for the months April to June were - 4.19 inches (1998), 1.64 inches (1999), 1.99 inches (2000), and - 2.62 inches (2002).

Precipitation data was summarized as days after urea application to the first precipitation event of 0.25 inch or more. As expected, the late fall and winter applications had the greatest number of days to this first precipitation event. The fewest days were recorded with the planting and

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Corn: early weed control (Continued from page 31)

Corn /weed competition

All weeds are not created equal. Each weed species competes differently with corn with some species being much more competitive than others. For example, common sunflower has a competitive index of 10 and is much more competitive than lambsquarters, which has a competitive index of about 2. Understanding the differences between each species and their competitive factors can be very important in determining what weed management strategy will provide the best return on investment.

Since weeds are not created equal we should acknowledge that neither are crops. Each crop differs in its competitive ability as well. Corn is one of the most competitive row crops planted in Nebraska. The relative competitive load necessary to cause a specific yield loss quantifies the competitiveness of a crop. For corn, it would take a competitive load of around 36, per 100 ft^2, to cause a 5% yield loss. (100 ft^2 is approximately 40 feet of row in 30 inch rows.) Sunflower has a competitive index of 10, therefore it would take 3.6 sunflower plants per 100 ft^2 (3.6 x 10 = 36) to cause a 5% yield reduction in corn. This assumes that the weeds emerge at the same time as the crop.

Accurately calculating yield loss, especially when several species of weeds are present in the field, can be difficult. WeedSOFT, a computer-aided weed management decision support tool, can be purchased from the University of Nebraska to supply this information at the click of a button. Using this type of technology allows for more accurate yield loss analysis and better information for making weed management decisions.

Early preplant and preemergence weed management

Controlling weeds before they become a problem just makes good sense. The old saying – "An ounce of prevention is worth a pound of cure" – is true with weed control in corn. Various techniques are available and depending on individual circumstances, one may be better than another. Producers need to determine their seasonal goals before committing to any one strategy.

Before we dive into all of the strategies available, be sure to refer to *Table 1* for an explanation of all the terms and acronyms used for preemergent weed control in corn.

Table 1. Pre-emergence herbicide terms

Acronym	*Treatment*	*Timing*
EPP	Early Preplant	10-30 days prior to planting
PP	Preplant	0-10 days prior to planting
PPSA	Preplant Surface Applied	0-30 days on the surface
PPI	Preplant Incorporated	0-30 days incorporated
PRE	Premergence	Planting time until crop emerges

Early preplant herbicide applications 10-30 days before planting offer many advantages to most producers, especially no-till farmers. First, early preplant treatments allow producers to burndown winter annuals including henbit and mustards and early summer annuals, including giant ragweed, common sunflower and lambsquarter. This can be very important in a year characterized by drought conditions as these early weeds, while not competing directly with the crop, can quickly rob precious soil moisture.

Second, an early preplant treatment reduces most if not all weed competition as the crop emerges from the soil. Although this early competition may not be the most critical with respect to yield, it can quickly reduce yield as corn enters the two-leaf stage. Another advantage is that in years with limited moisture, the herbicide has a greater chance of being activated before the crop emerges. A disadvantage of the early preplant treatment is decreased longevity of residual activity. Common sense tells you the earlier a herbicide is applied to the soil, the earlier it will stop working. Postemergence programs need to be carefully evaluated before decisions are made and some knowledge of the field's weed history will be helpful.

Preplant is similar to early preplant in that many of the same herbicides can be used. Treatments are typically made 0-10 days before planting. Preplant doesn't give you the advantage of catching early weeds, but it may provide the needed residual to set the stage for a good postemergence treatment.

A preemergence treatment, applied after the crop is planted but before emergence, offers many of the same advantages. An additional advantage is that it allows the producer to increase the longevity of the herbicide. This works well with conventionally tilled fields and provides increased management flexibility later in the season as summer annuals begin to emerge.

Table 2 lists labeled preemergence herbicides and their application timings. As always, read, understand, and follow the label supplied with each product. For further evaluation of herbicide efficacy on weeds and weed/crop competition, see the *2003 Guide For Weed Management in Nebraska* (EC03-130). It's available from your local Cooperative Extension Office or online at *http://www.ianr.unl.edu/pubs/fieldcrops/ec130.htm.*

Brady Kappler
Weed Science Educator

Corn: early weed control *(Continued from page 34)*

Table 2. Preplant/preemergence herbicides for corn.

Treatment	*Rate/acre*	*Application information*
Aatrex/Atrazine	2.2 lb[a]	EPP, PPSA, PPI, PRE, EPOST.
Axiom DF	15 - 18oz[a]	EPP, PPSA, PPI, PRE
Axiom AT	1.5 - 4 lb/a[a]	EPP, PPSA, PPI, PRE
Balance Pro	1.9 - 3.0 oz[a]	PPSA, PPI, PRE Do not use where water table is within 25 feet on loamy sand or sandy loam and soil organic matter is less than 2% or on coarse soils with soil organic matter <1.0%. On medium soils with pH >7.5, reduce rate by 0.25 oz/a from recommended rate.
Bicep II Magnum	1.6 - 2.1 qt[a]	EPP, PPSA, PPI, PRE, POST
Bicep Lite II Mag.	1.1 - 1.5 qt[a]	EPP, PPSA, PPI, PRE, POST
Bullet	3 .2 qt[a]	PPSA, PRE
Callisto	6 oz[a]	PPSA, PRE
Define	14 - 16 oz[a]	PPSA, PPI, PRE
Degree	3.2 - 4.0 pt[a]	EPP, PPSA, PPI, PRE, POST
Degree Xtra	3.5 qt[a]	EPP, PPSA, PPI, PRE, POST
Dual II Magnum	1.3 pt[a]	EPP, PPSA, PRE, POST
Dual IIG Magnum	8 - 10 lb[a]	EPP, PPSA, PRE, POST
EPIC	11 - 15 oz[a]	EPP, PPSA, PPI or PRE. Use low rates for soils with pH _>7.4 or < 1.0% organic matter.
Fultime[a]	2.7 - 3.0 qt[a]	EPP, PPSA, PRE
G-MAX lite	2.5 pt[a]	PPSA, PRE, PPI, EPOST
Guardsman Max	2.9 - 3.4 pt[a]	PPSA, PRE, PPI, EPOST
Harness[a]	2.25 qt[a]	PPSA, PRE, EPOST
Harness Xtra[a]	2.3 qt[a]	PPSA, PRE, EPOST
Hornet WDG	4.0 - 5.0 oz[a]	PPSA, PRE, EPOST
Keystone	2.4 - 2.8 qt[a]	PPSA, PRE, EPOST
Keystone LA	1.8 - 2.1 qt[a]	PPSA, PRE, EPOST
Lasso II	17 - 20 lb[a]	PPSA, PRE, EPOST. Do not use on soils < 1.0% organic matter
Micro Tech/Lasso	2 qt[a]	PPSA, PRE, EPOST
Outlook	14 - 16 oz[a]	PPSA, PPI, PRE, EPOST
Prowl/Pendimax	1.8 qt	PRE. Do not use on soils < 1.0% organic matter. Do not incorporate.
Python	1.0 oz[a]	PPSA, PPI, PRE
Surpass[a]	1.5 - 2.5[a]	PPSA, PRE, EPOST
TopNotch	2 - 2.5 qt[a]	PPSA, PRE, EPOST

[a] Rates dependent on soil type and application type. Those listed are based on a silt-loam soil with 1-2% organic matter.

Nitrogen volatilization *(Continued from page 33)*

V6 application timings. The longer urea lays on the soil surface, the greater the chance of ammonia volatilization, especially under moist, warm conditions. However the temperatures were cooler during the fall and winter applications as compared to the spring applications. Apparently, low temperature conversion of urea to ammonia and volatilization can take place although probably very slowly. Data from Canada indicate if the soil surface is wet and soil temperature is near 50 °F, losses were about 1.5 lb of nitrogen a day. In the South Dakota studies, the affect that warmer temperature might have had on nitrogen volatilization was diminished with the occurrence of precipitation soon after nitrogen application as seen with the planting and V6 application timings. This data would suggest that nitrogen is lost through volatilization when significant rainfall after nitrogen application is delayed even if temperatures are relatively cool.

We appreciate the financial support of the SD Corn Utilization Council for partial funding of these studies.

Anthony Bly, Research Associate
Ron Gelderman, Professor
South Dakota State University

(Reprinted with permission from the March 12 *Dakota Dirt*, a publication of the SDSU Soil Testing Lab.)

Selecting the right sprayer nozzle tip for the job

Proper selection of a nozzle type and size is essential for proper pesticide application. The nozzle tip is a major factor in determining the amount of spray applied to an area, the uniformity of application, coverage of the target, and the amount of potential drift.

Nozzles break the liquid into droplets, form the spray pattern, and propel the droplets in the proper direction. They determine the amount of spray volume at a given operating pressure, travel speed, and spacing. Drift can be minimized by selecting nozzles that produce the largest droplet size while providing adequate coverage at the intended application rate and pressure.

Spray particle size

The size of the spray particle is important because it affects both efficacy and spray drift of the pesticide. If you double the size of the spray particle (for example 300 to 600 microns) and the application volume stays the same, you have only 1/8 as many spray droplets. For optimum efficacy and 10 to 20 gallon spray volumes a medium droplet size is suggested for contact non-translocating herbicides and a coarse droplet size for contact translocating herbicides. Concern for drift may cause you to consider larger droplet sizes and higher spray volumes.

For preplant and preemergence herbicide application without a burndown herbicide and with liquid fertilizer, use nozzle tips which produce a very coarse or extremely coarse droplet size. The larger spray particles help reduce drift and evaporation. This is because nozzle tips which produce larger spray particles produce less small droplets.

Table 1 is a spray nozzle selection guide for broadcast applications. Remember, if you are banding use an even flow nozzle. An example of this nozzle would be AI9504E. The E tells you that this is an even flow nozzle tip which applies the same amount across the entire spray pattern.

Robert Klein, Extension Cropping Systems Specialist
West Central REC

Table 1. Spray nozzle selection guide for broadcast application.*

	Herbicides				
	Soil-Incorporated	*Pre-Emerge*	*Post-Emerge*		*Liquid Fertilizer*
			Contact	*Systemic*	
Turbo Jet	Good	Good	Good	Good++	Good
Air induction	Good+	Good+	Good	Good++	Good+
Extended range flat fan	—	—	Good++	Good	Good
Pre-orifice flat fan	Good+	Good+	Good	Good+	Good
Standard flat fan	—	—	Good	Good	—
Twin orifice flat fan	—	—	Good+	—	—
Turbo Floodjet	Good++	Good++	—	Good	Good++
TurfJet	Good++	Good++	—	Good	Good++
Solid cone	—	—	—	—	Good+

* Mention of trade and company names does not imply endorsement or preferential treatment of the product names by the University of Nebraska-Lincoln.

— Information not available or not applicable.

Removal timing critical when grazing wheat

Winter small grains are beginning spring growth. If properly managed, they can provide both for early grazing and grain; however, if mismanaged, early grazing can reduce subsequent grain yield. The difference is all in the timing.

The developing grain head on all small grains (winter wheat, rye, triticale, barley) is located just above the highest stem node of the plant. Grain yield is jeopardized when this structure elongates and elevates to a height that is susceptible to being removed by grazing livestock. Generally, this occurs when the growth stage we call 'jointing' begins, usually about mid-April (earlier in southern Nebraska and later in the northern counties). Maintaining a 2- to 3-inch minimum stubble helps.

The jointing growth stage is easy to identify. Before jointing, all nodes are small and grouped together at or below the soil surface. Only a

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For more information on grazing wheat

For further research, information, and illustrations related to early grazing of winter small grains, visit *CropWatch* online or view an article by Oklahoma State University researchers Gene Krenzer and Gerald Horn on "Economic Impact of Grazing Termination in a Wheat Grain-Stocker Cattle Enterprise" available online at *http://www.agr.okstate.edu/plantsoilsci/extension/publications/wheat/pt97-5/PT97-5%2520.htm* Also see *another OSU publication, "Wheat Pasture Grazing Termination Makes Dollars and Sense" at http://www.firsthollowstem.okstate.edu/L-309.pdf*

In Nebraska trials

Efficacy of YieldGard Rootworm® resistant corn

UNL entomologists have conducted trials at various locations over the last few years with the Monsanto corn hybrids expressing the insecticidal Cry3Bb1 Bt protein. This protein is expressed in the roots and is active against corn rootworm larvae. This is a different Bt protein than has been used in past Bt hybrids which were active against European corn borer and other caterpillars. The Cry3Bb1 protein is coleoptera- (beetle) specific and is not active against European corn borers.

Monsanto has received EPA registration of the MON863 event expressing this protein, and several companies will be marketing YieldGard® hybrids which utilized this event. An article in the March 7 *CropWatch* described the refuge requirements for MON863 hybrids, which differ in several ways from the refuge requirements for previous Bt corn hybrids.

The table below summarizes results from a replicated small plot (4 row x 30 foot) trial conducted in 2002 at the South Central Research and Extension Center Research Farm near Clay Center. The trial evaluated a MON863 hybrid and its sister line for efficacy against western corn rootworms. Levels of feeding injury were assessed in mid-July using the 0-3 node injury rating scale developed at Iowa State University. This scale is different than the 1-6 scale commonly used in the past for corn rootworm insecticide efficacy trials across the Midwest. On the 0-3 scale, 1=1 node of roots pruned to within 1.5 inches of the stalk, 2=2 nodes pruned, and 3=3 nodes pruned. Partial units represent the fractional portion of a node pruned.

This study was planted in an area late planted to corn the year before, so there was heavy rootworm pressure (2.96) in the untreated isoline. The YieldGard hybrid has significantly lower root injury than any of the soil insecticide or seed treatment rootworm insecticides evaluated. The best soil insecticide treatment was significantly less effective than the YieldGard hybrid, although all the soil insecticide and seed treatments did provide significant root protection, compared with the untreated isoline. Similar results were obtained in a study at Clay Center in 2001. Limited seed was available for these trials, and no yield data were taken in either year.

Additional information about the 2002 study and results from the 2001 study at Clay Center are available at *http://screc.unl.edu/entomology/CRW/scalcrwrescorn.htm*

Bob Wright, Extension Entomologist
South Central Ag Laboratory

Evaluation of Yieldgard® Corn Rootworm corn and soil insecticides for larval corn rootworm control, Clay Center, Nebraska, 2002

Corn hybrid description[1]	*Event*[1]	*Insecticide product*[2]	*Avg. root rating*[3]
YieldGard Rootworm® corn + seed treatment	MON863	-------	0.13 a
Isoline	-------	Force® 3G	0.52 b
Isoline	-------	Lorsban 15G	0.77 b
Isoline	-------	Aztec® 2.1G	1.08 c
Isoline + seed treatment	-------	-------	1.34 d
Isoline + seed treatment	-------	Prescribe™ ST	1.75 e
Isoline + seed treatment	-------	-------	2.96 f

[1]The YieldGard Rootworm® Corn evaluated was hybrid TP6705-BG. This hybrid contains the transgenic event MON863 which expresses the cry3Bb1 gene encoding a Coleopteran-specific insecticidal protein from *Bacillus thuringiensis kumamotoensis*. The conventional corn hybrid, XP6705AY, was the hybrid isoline to the transgenic hybrid, TP6705-BG, and was evaluated in all other treatments.

[2]Insecticide granules were applied in a 7-inch band in front of the press wheels and over the open seed furrow (t-band placement). Rate of product: Aztec® 2.1G @ 6.7 oz/1000 row ft, Force® 3G @ 5 oz/1000 row ft and Lorsban 15G @ 8 oz/1000 row ft. Prescribe™ ST was tested as a seed treatment at a rate of 1.34 mg active ingredient per kernel.

[3]The Iowa State University Node Injury 0-3 Scale was used to evaluate root injury ratings. Means in a column followed by the same lower case letter are not statistically different using Fisher's protected LSD (0.05).

Corn flea beetles may not have overwintered well

Winter conditions generally were not favorable for overwintering survival of the corn flea beetle this year. The accompanying map shows the sum of the average temperatures for December, January and February. *(Map developed by Al Dutcher, State Meteorologist, High Plains Climate Center)* If this value is above 98°F in an area, high winter survival of the corn flea beetle can be expected. Areas with values from 80°F to 98°F are expected to see normal survival and areas below 80°F are expected to see below average survival. Corn flea beetle feeding causes direct damage, but perhaps more importantly, the beetle is a vector of Stewart's Wilt.

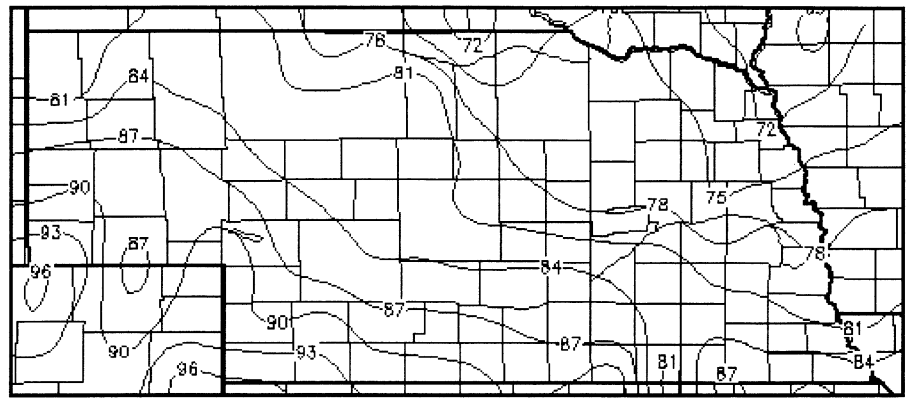
Corn flea beetles overwinter as adults in protected areas near corn fields. They become active in April and feed on a variety of grasses before corn emerges. Corn flea beetles can directly injure corn by feeding on seedling plants; however, probably more importantly they vector the bacterium which causes Stewart's wilt. (For more information, see the NebGuide, "Stewart's Wilt of Corn in Nebraska," G1462.)

To minimize damage caused by flea beetle feeding:

- Avoid hybrids or inbreds known to be more susceptible to Stewart's wilt (see seed catalog or local seed company representative).
- Avoid early planting dates if susceptible inbreds or hybrids are planted.

Seed treatments containing imidacloprid (Gaucho, Gaucho Extra and Prescribe), or thiamethoxam (Cruiser) are systemic and provide some protection from feeding by flea beetles and other early season soil insects.

Scout for corn flea beetles on seedling corn. Postemergence treatment may be warranted on dent corn if 50% of plants show severe flea beetle injury (plants look silvery or whitish, or leaves begin to die), and five or more flea beetles per plant are found. If susceptible inbreds or hybrids are grown, an insecticide may be needed when two to three flea beetles per plant are present and 10% of the plants show severe flea beetle injury.



The sum of average temperatures for December, January and February. Areas below 80°F are expected to see below average survival of flea beetles, areas above 98°F are expected to see above average survival of flea beetles. Corn flea beetle feeding causes direct damage, but perhaps more importantly, the beetle is a vector of Stewart's Wilt. *(Map developed by Al Dutcher, State Meteorologist, High Plains Climate Center.)*

A variety of foliar insecticides are effective in controlling flea beetles. They include: Lorsban 4E, 2-3 pt/acre; Sevin XLR Plus, 1-2 quarts per acre, Asana XL, 5.8-9.6 fl. oz per 1000 row-ft; Lannate LV 0.75-1.5 pt/acre; Pounce 3.2 EC 4-8 fl. oz per acre; Warrior 2.56-3.84 fl. oz per acre), Mustang Max 2.72-4.0 oz per acre; Baythroid 2 1.6-2.8 oz per acre.

Bob Wright
Extension Entomologist
South Central Ag Laboratory

Seed alfalfa no-till to save moisture

With less crop residue from last year in some fields and limited soil moisture this spring, no-till might be a good way to establish alfalfa this year. There are some obvious advantages to seeding alfalfa no-till, like fewer trips across the field and the resulting savings of fuel and time. In addition, retaining crop residues will help reduce soil erosion. No-till also conserves soil moisture, which may be the best reason of all this spring. The lack of tillage also will provide for a firm seedbed and contribute to rapid seedling emergence. Finally, no-till will limit the number of new weed seeds near the soil surface.

Disadvantages to no-till include relying solely on clipping or post-emergence herbicides for weed control. Fortunately, we have good post-emergence herbicides available. Another problem is ridges from prior row crops that can interfere with uniform seeding as well as make fields rough for future haying operations. And finally, some drills do not work well for no-till seeding so equipment might limit your options.

If you can do it, no-till alfalfa is worth trying. It works really well in bean stubble and almost as well in small grain stubble. No-till is a bit more difficult in corn and milo stubble, especially if there is much row ridging. Be sure to kill any early weeds with Roundup or Gramoxone before planting. And last but not least, use a drill that places seed about one-half inch deep and then covers seed with soil using a good press wheel.

Bruce Anderson
Extension Forage Specialist

Average last freeze occurs April 15-30

March brings some precipitation relief

As one would expect, March was a month of contrasts, both in temperature and precipitation. Average temperatures ranged from two degrees below normal through the I-80 corridor between Lincoln and Omaha to four degrees above normal across southwest Nebraska. On a statewide average, Nebraska came in at about two degrees above normal for the month.

Above normal precipitation was recorded across the western third of the state. Many locations in the southwest and northwest Panhandle received over 1.50 inches of moisture during March. The remainder of the state received 0.25 to 1.50 inches. Central and south central Nebraska recorded the driest conditions with most locations receiving 0.25 to 0.50 inches of moisture.

Most of the month's precipitation fell with the large storm system that pounded the Colorado front range in mid March – a storm expected to rank as one of the top five strongest on record there. An area 150 miles long and centered over Denver received 3-7 feet of snow. You have to go back to 1997 to find a snowstorm that shut down transportation systems in a comparable magnitude.

Certainly this major storm will provide significant moisture for increased streamflow on the southern branch of the Platte River. Preliminary estimates indicate that the snowpack within the basin increased from 75%-80% of normal to 95-110% of normal. Because reservoirs in northeast Colorado were nearly empty, most of the runoff probably won't increase flows on the southern branch of the Platte in Nebraska. Even with this major event, irrigation restrictions will probably continue in Colorado, since hydrologists have indicated that it would take a snowpack of 150% of normal by mid-April to alleviate water restrictions.

Southeast and south central Wyoming did receive good snowfall, but not to the extent of central Colorado. Most locations received 1-3 feet of snow. This will likely translate into a small boost for runoff into the northern branch of the Platte. It's too early to tell whether Nebraska will see significant increases since Wyoming reservoirs have tremendous storage space available to capture runoff.

The Climate Assessment Response Committee was to meet April 3 to discuss the reservoir and irrigation picture across the state. In addition the Natural Resource and Conservation Service will issue their final snowpack and streamflow estimates the week of April 7. Results and details of the CARC meeting will appear in future editions of *CropWatch.*

Top soil moisture levels did show significant improvement across western Nebraska. Most soil moisture monitor sites indicated a 1.00-1.50 inch improvement in available moisture during March. It is important to remind readers that these sites are under grass and only provide a relative estimate of moisture that may exist under fields dedicated to grain production.

Soil moisture monitoring sites across the western third of the state indicate 1.50-3.00 inches of available moisture. The central third of the state has 2-4 inches available, while the eastern third has 3-5 inches available. A five-foot profile generally will contain 10 inches of available moisture at field capacity for clay and silty loams, 8 inches for sandy loams, and 6 inches for fine sands.

The large system that traversed the country in mid March originated in the Gulf of Alaska. It appears that as one upper air low moves southeast into the central Rockies, it is replaced by another upper air low. As long as this pattern continues, we should expect active weather. We would need to see this pattern continue through May to sufficiently recharge our dry soils.

Expect large temperature fluctuations with the potential for severe weather outbreaks as long as the current pattern continues. This is especially true with near record to record highs being recorded on several occasions in March. I don't like to see temperatures in the 80s this early in the year because it can promote a false sense of security. The average date of the last 28°F temperature generally falls between April 15 and April 30. Producers jumping the gun too early may be surprised by a killing freeze later in the month.

In the near term, it appears that a rather potent system will affect the central U.S. this weekend. Severe weather could occur as far north as central Nebraska. In addition, enough cold air could be drawn into this system to develop snow across the Panhandle and Sandhills. Strong winds will accompany this system, so soil erosion could be a problem. After this system passes we will be watching the Gulf of Alaska for the development of another strong system that could have an impact on the central United States April 12-18.

Graphic illustrations of these weather patterns are available on the *CropWatch* web site at *http://cropwatch.unl.edu.* You will be able to view precipitation trends for the last 30 days, soil moisture recharge for the period (10/1-date) and the last three years for the western and eastern Corn Belt.

Al Dutcher
State Climatologist

Proso offers benefits in reduced irrigation areas

Proso millet, *Panicum miliaceum* (L.), is a warm season grass capable of producing seed 60 to 90 days after planting, while using limited water. It has been called millet, hog millet, and yellow hog. Proso can be used as bird and livestock feed in the United States and for livestock feed and human consumption in other countries. The feed value of proso millet for cattle and swine is generally considered to equal that of grain sorghum or milo and corn (when less than 50% of the corn in the ration is replaced).

As a dryland crop grown without fallow, proso is a very efficient user of soil water and can produce a grain crop with 13 to 14 inches of annual moisture. Studies at Akron, Colo., indicated that proso begins producing grain after only 6 inches of total water use, while winter wheat requires 9 to 10 inches of water before grain production begins. Proso also has worked well under irrigation after a row crop like corn or sorghum because proso tolerates atrazine that may remain in the soil after the corn or sorghum crop. It also can be planted after beans, beets, potatoes or alfalfa if residual grass herbicides are not an issue.

Proso has a shallow rooting system. Its rooting depth is generally limited to the upper 6 to 12 inches. It is one of the most efficient crops at removing moisture from the topsoil and converting it to dry matter. Proso requires approximately 270 pounds of water to produce 1 pound of dry matter; wheat requires approximately 530 pounds of water to produce 1 pound of dry matter.

For these reasons proso may be a valuable alternative for irrigated land with less than normal available irrigation water. Irrigated yields may be as high as 40 cwt per acre, although yield might more typically range from 30 to 35 cwt per acre. Proso has minimal straw strength relative to wheat so production practices targeting yields higher than this usually result in lodging and significant yield losses.

The most serious problem with irrigated proso production is wild proso. Select fields where there is no history of wild proso. Buffalobur also can cause the crop to be rejected. Most broadleaves can be controlled, but sandbur can be a serious competitor.

The bulk of proso sold in the cash trade is marketed through elevators in the counties where it is grown most extensively. This grain is cleaned further, processed, and used for bird seed. Both domestic and wild bird seed is packaged by adding other grains for color and nutrition. Some proso goes through a dehulling process and supplies both human and animal needs. Some is exported and some is used for specialty purposes, such as mushroom production. Proso is the only millet of quantity involved in world trade. As a feed grain, some cracking improves utilization.

Proso prices have historically been higher than corn or sorghum, but this varies dramatically from season to season. When the premium human food and bird seed markets are saturated, the price quickly drops to feed grain values or less as conversion from corn to proso can cost some money. Proso prices have ranged from $1.50 to $20 per cwt over a five-year period.

Predictions are always difficult, but proso millet may have a positive fit for the 2003 production year. For more information on proso production practices refer to *Producing and Marketing Proso Millet in the High Plains*, EC 95-137, available at your local NU Cooperative Extension Office.

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Grazing wheat *(Continued from page 36)*

'pseudo' stem comprised of tightly wrapped sheaths of leaves gives the plant erect growth. When jointing occurs, the first node becomes swollen and appears above the soil surface. It can be seen or felt. This begins formation of the true stem with the grain spike just above this first node. A sharp knife can split the stem lengthwise to see the location of the hollow (in most varieties) true stem, the hard and swollen node, and an elongated, triangular shaped developing grain spike.

Grazing tends to slightly delay the onset of jointing. Thus, a good way to avoid grain yield reduction is to protect a small area of the field from grazing and observe ungrazed plants for the onset of jointing. If animals then are removed from the small grain pasture, little grain yield reduction will have occurred as a result of grazing removing grain heads. Grazing often can continue for a week to 10 days beyond the onset of jointing with only slight grain yield reduction as long as a minimum of 2 to 3 inches of stubble remains ungrazed. Both irrigated and dryland fields respond similarly.

If the primary grain head is removed, plants sometimes produce new tillers but these new tillers usually do not produce grain.

Spring small grains, like oats, behave similarly. They will not elevate their seed heads until about one month later than winter small grain. Tillers stimulated by early grazing can form some grain.

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