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CropWatch No. 2003-10, May 16, 2003

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Jasa, Lisa, "CropWatch No. 2003-10, May 16, 2003" (2003). *Crop Watch*. 36.
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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2003-10
May 16, 2003

Despite delayed May planting dates,

Don't switch to shorter-season corn yet

Many Nebraska corn growers are anxiously waiting to plant their crop. Rains, although much hoped for, have delayed planting by a week or more. As we head into mid-May some are wondering about switching to earlier maturing hybrids out of a concern that delayed planting of full-season hybrids may expose them to a greater risk of frost prior to crop maturity. Fortunately, although delayed planting shortens the growing season, corn hybrids adjust well to this. Adapted hybrids can be planted into early June without major risks of fall frost injury.

A review of Midwest research on the effects of late corn planting dates and fall frosts can be helpful at this time. It is clear that delayed planting usually reduces corn yields. A recent report by Golden Harvest summarized yield across several "northern" Cornbelt locations including Hastings, North Platte and Waterloo, Nebraska. The trials were conducted from 1993 to 2001. The greatest yield potential occurred with a May 7 planting date. Yield potential declined slowly during mid-May and dropped rapidly in late May and early June. For example, yield potential with a May 19 planting date was about 94% of maximum while that of May 29 was about 83%.

Of course, every year is different and planting late in 2003 may actually enhance yield. The Golden Harvest work from all north and south locations also shows that grain moisture contents at harvest increased about 1% for every four- to five-day delay in planting date.

In addition to the issue of potentially lower yields with delayed planting is concern about the possibility of frost occuring before crop maturity. One of the NebGuides (G1312) listed in the *Sources* section includes data for autumn frost probabilities in Nebraska. A map (*above*) from the NebGuide shows the median probability of a 32° fall freeze and indicates that in a large portion of southeast and south central Nebraska, half of the freezes would be likely to occur before October 6 and half would be likely to occur afterward. Ideally I'd like to have corn mature at least two weeks before this date.

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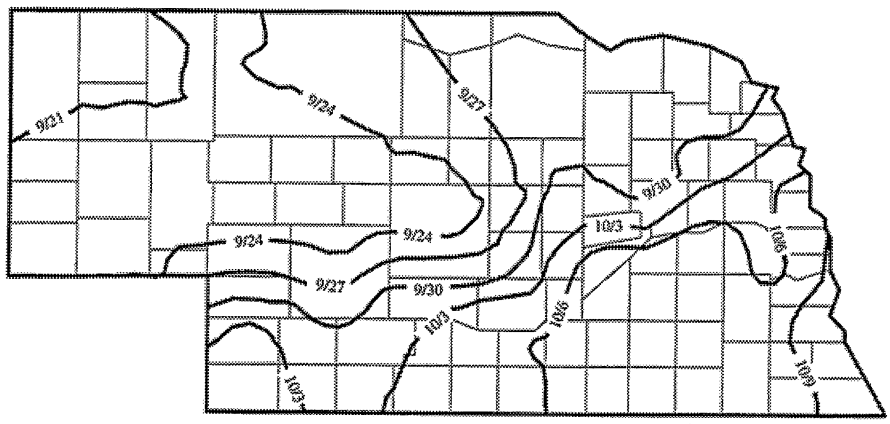

Median autumn freeze (32°F) date. Half of all autumn freezes will occur before the dates shown on this map and half will occur after (based on 47 years of records, 1949-1995). From the NU NebGuide, *Autumn Freeze Probabilities* (G96-1312).

Inside

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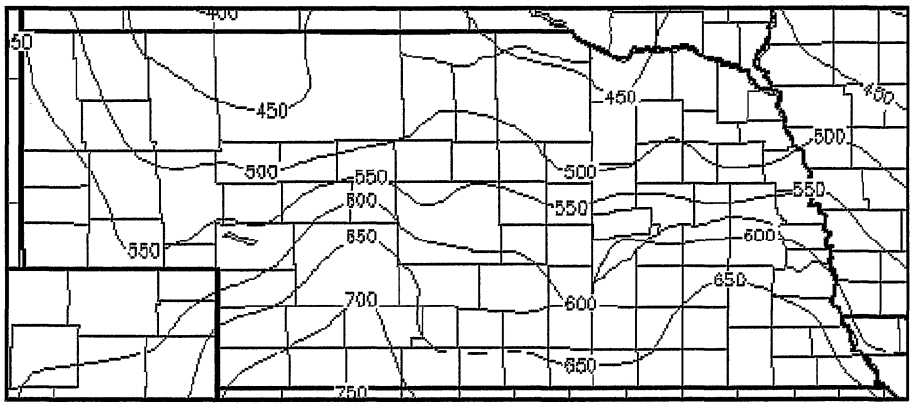

Alfalfa weevil scouting

This map shows accumulated growing degree days base 48 as of May 15. All of the state has passed the 350 GDD threshold and scouting should be underway for alfalfa weevil feeding. (*Map prepared by Al Dutcher, state climatologist, NU School of Natural Resources.*)

Field reports

Tom Dorn, Extension Educator in Lancaster County: Lancaster county has received several rains in the past couple weeks. Total rainfall ranges from about two inches to over four inches or more in the county. Southern Lancaster County experienced hard rain Thursday evening that caused some soil erosion on tilled fields. Planting progress is variable. Some farmers were nearly done planting corn before the rains started while others had yet to start. Soybean planting had only just begun in most areas prior to the rain. Wheat and pastures look good.

Keith Jarvi, IPM Extension Assistant at the Northeast REC: AT the start of the week, planting in the northeast was at a standstill with almost no soybeans in yet. Corn planting is 35% to 90% completed, depending on location. More fields are planted in the lighter soils out west The alflafa looks very good but conditions are good for the development of spring black stem and producers should be scouting fields and preparing to take an early cutting if bottom leaves are yellowing and falling off. Most areas have received over 3 inches of rain over the last three weeks with some areas receiving much more. Unfortunately, erosion has been high where waterways have been removed for larger planting equipment.

Ron Seymour, Extension Educator in Adams County: There has been sufficient rain so that water is standing at the low end of fields. Despite wet fields and delayed planting, about 75% of the corn is in. Of the corn that had been planted earlier, about 50% has emerged. Winter wheat continues to improve with much of it reaching the boot stage. Alfalfa fields are growing well and first cutting will begin soon. Some fields sustained hail injury from a recent thunderstorm. Pasture conditions continue to improve but the subsoil is still dry.

Corn flea beetles now feeding in southeast Nebraska fields

Injury from corn flea beetles is being reported in parts of southeastern Nebraska near the Kansas border. This corresponds to the area that was most favorable for flea beetle overwinter survival based on temperature accumulations reported in the April 4 *Crop Watch*. As corn emerges scout seedlings for injury and insect presence. Warmer temperatures will allow corn to emerge more quickly and grow out of low to moderate levels of injury from a variety of early season pests.

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. See the April 4, 2003 *CropWatch* for further information on controlling corn flea beetles. It is available on the Web at *cropwatch.unl.edu/archives/2003/crop03-4.htm#corn_flea_beetle*

Bob Wright
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CROP WATCH
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Crop Watch is published from March to November by Cooperative Extension and Communications and Information Technology in the University of Nebraska Institute of Agriculture and Natural Resources, PO Box 830918, 108 Agricultural Communications Bldg., UNL, Lincoln, NE 68583-0918. To order a print subcription or to change your address, write to *Crop Watch* at the above address or call (402) 472-7981. The newsletter also is available on the web at **cropwatch.unl.edu**

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

Delayed planting *(Continued from page 91)*

We also should consider measures of crop maturity, which can become somewhat confusing given the variety of measurement systems available. While there is no single standard, researchers Bob Nielsen (Purdue University) and Peter Thomison (Ohio State University) clarified the relationship between hybrid comparative relative maturity (CRM) and growing degree days (GDD). The CRM system they used is similar to that of Pioneer Hi-Bred International and is thought of as days required from planting to maturity. The equation generated for this relationship was:

Hybrid GDU to black layer = $24.908x - 82.821$ ($R^2 = 0.9273$)
where x is CRM.

For every day increase in CRM, GDD requirements appear to increase about 25 units. *Table 1* shows this relationship too:

Table 1. Relationship between CRM and GDD for days to physiological maturity (black layer) (86/50) for 'normal' planting dates.

CRM	GDD
100	2408
105	2533
110	2657
115	2782
120	2906

Based on this table, a 115 CRM hybrid would use about 2800 GDD to mature *with a normal planting date.* The last five words are important! Research cited by Nielsen and Thomison shows that: 1) although delayed planting shortens the growing season, corn hybrids adjust to this well, and 2) adapted hybrids can be planted into early June without major risks of fall frost injury.

Nielsen and Thomison found that delayed planting decreases hybrid GDD to physiological maturity (black layer) by about 6.8 GDD per day. Thus, we can plant full season hybrids much later than we used to think and they will still mature before the risk of fall frost is high. With the 6.8 GDD loss per day with delayed planting, a hybrid planted on the May 30 would behave much like a hybrid with 204 less GDD planted on May 1. *Table 2* combines the relationship of CRM and GDD with the concept of reduced GDD requirements for delayed planting:

In most of Nebraska's corn growing area, it is not necessary to change to earlier maturing hybrids until early June.

A 115 CRM hybrid (2782 GDD) planted on May 15 would behave like a 111 CRM hybrid and when planted on May 30 it would behave like a 107 CRM (2578 GDD) hybrid. If planted on May 30 this hybrid should mature around September 14 in southeast and southern Nebraska and around September 27 in central and northeast Nebraska. These probabilities are based on the Zone A and B maps and tables in the NebGuide, *Maturity Dates and Freeze Risks Based on Growing Degree Days* (G83-673).

The probability of a 32° freeze occurring before maturity is less than 26% for most of the corn-producing area in Nebraska (Zones A and B in Figure 1 of the cited NebGuide). This is about a little more than a week earlier than average date for a 32° frost. That may be too close for comfort for some of us. A 120 CRM hybrid planted on May 30 would have nearly a 50% probability of frost damage before maturity. Fortunately, we don't grow too many hybrids of this maturity. Use the tables in NebGuide G83-673, *Maturity Dates and Freeze Risks Based on Growing Degree Days,* to develop estimates for other hybrids and zones.

It is not necessary to change to earlier maturing hybrids until early June for most of Nebraska's corn production area if hybrids require 115 CRM or less to mature. Even considering this, when fields are dry

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Table 2. Relationship between CRM and GDD for days to physiological maturity (black layer) (86/50) for normal and delayed planting dates.

For a "normal" May 1 planting date		For late planting dates May 15 Planting Date		May 30 Planting date	
CRM	GDD	CRM	GDD	CRM	GDD
100	2408	96	2306	92	2204
105	2533	101	2431	97	2329
110	2657	106	2555	102	2453
115	2782	111	2680	107	2578
120	2906	116	2804	112	2702

Delayed planting

(Continued from page 93)

enough to plant, I'd plant my full-season hybrids first. We may be blessed with more rain later in May that could delay planting even more! If planting dates are delayed into mid-June, then you may want to plant crops other than corn.

Sources

The following three NebGuides are available from your local Cooperative Extension Office or on the Web at the addresses provided.

Growing Degree Day Requirements and Freeze Risk as a Guide to Selecting and Planting Corn Hybrids (G86-796), R. E. Neild, Extension Climatologist, available at *http://www.ianr.unl.edu/pubs/fieldcrops/g796.htm*

Maturity Dates and Freeze Risks Based on Growing Degree Days (G83-673), R. E. Neild, Extension Climatologist, D. T. Smith, Research Graduate Assistant, available at *http://www.ianr.unl.edu/pubs/fieldcrops/g673.htm*

Autumn Freeze Probabilities (G96-1312), Steven J. Meyer, Extension Specialist, Agricultural Climatology, Allen L. Dutcher, Nebraska State Climatologist, available at *http://www.ianr.unl.edu/pubs/fieldcrops/g1312.htm*

This publication also includes a table of the earliest, median, and latest date of the last occurrence of a light (32°F) and moderate (28°F) autumn freeze for 48 locations in Nebraska (based on 47 years of data, 1949-1995).

Delayed Planting and Hybrid Maturity Decisions. R.L. Nielsen, and Peter Thomison. 2002. Purdue Coop. Extension Service. AY-312-w, available in a pdf format at *http://www.agry.purdue.edu/ext/pubs/AY-312-W.pdf.*

Roger Elmore
Extension Crops Specialist
South Central Ag Lab

In corn: Choosing the right postemergence herbicide

As soon as planting ends, many producers will start spraying for weeds. In this article we take a look at postemergence corn herbicide options.

Consider several factors when choosing a postemergence herbicide. The first and most important is its efficacy on the weed species present. You obviously want a herbicide that works well, but some herbicides provide better control on some weeds than others. Also consider crop safety and timing of the herbicide application. For example, one herbicide will have good activity on many grass and broadleaf weeds, but should not be applied to corn over 12 inches tall. All herbicides carry some type of timing restriction and pushing those limits can easily result in crop injury or reduced weed control. In the end that can mean lost dollars from yield loss.

Often, efficacy is influenced by the rate used. Choose a herbicide that will allow you to use the required rate for different weed sizes. For example, 24 oz/ac of glyphosate will do well on most velvetleaf plants in the 1–3 inch stage; however, if you are dealing with 4-8 inch weeds, increase the rate to 1 qt/ac. Use caution when increasing rates of most herbicides because this can increase the possibility of crop injury.

See table of POST herbicides, page 95

Finally, follow label recommendations regarding additives. Many labels will suggest adding crop oil (COC), AMS, or othe additives to enhance herbicide movement or uptake into the plant. The right additive can really help provide great weed control; however, the wrong additive can cause serious crop injury and/or poor weed control, which once again translates into yield loss. As always, read and follow the label recommendations and restrictions for maximum herbicide efficacy and crop safety.

Brady Kappler, Extension
Weed Science Educator

May 1 estimate puts wheat harvest up 9%

Based on May 1 conditions, Nebraska's 2003 winter wheat crop is forecast at 62.7 million bushels, up 29% from last year's crop, according to the USDA's Nebraska

Agricultural Statistics Service. Average yield is forecast at 38 bushels per acre, up 6 bushels from last year's yield and virtually equal to the ten-year average.

Acreage to be harvested for grain is estimated at 1.65 million acres, up 9% from last year. This would be 94% of the planted acres, up from last year's 92% and the ten-year average of 93%. As of May 4, topsoil moisture supplies were rated mostly adequate in the major wheat growing areas. Disease and insect pressure to date has been light.

Lumax receives 2EE label for Steadfast, Accent

The EPA has granted a 2EE label for Lumax where herbicide application have been delayed due to weather and emerged grasses are a problem.

Now you can add the labeled rate of Steadfast (0.75 oz/ac) or Accent (0.67 oz/ac) to the rate of Lumax for your soil. This tank mix should be applied before the corn is 5 inches tall. Only use NIS as the additive. The use of MSO, UAN, and AMS is not recommended and COC may cause injury to the corn.

Brady Kappler, Extension
Weed Science Educator

Postemergence corn herbicides

Herbicide	Primary Activity	Timing	Rate/a	Additive[1]
ATRAZINE	Broadleaf + Grass	Corn <12", BL[6] 2-6", grass <1"	1.4-2.2 lb	COC 1qt
ACCENT	Grass	Corn up to 20", BL <4", grass <3"	0.67 oz	COC 1gal/100[3]
ACCENT GOLD	Broadleaf + Grass	Up to V6, weeds 1-3"	2.9 oz	COC 1 gal/100 gal, 28%N 1-2 qt
AIM	Broadleaf	2 leaf to 48"	0.5 oz	NIS 1 qt/100 gal, COC 1 gal/100 gal, or 28% 2-4 qt/a
BANVEL	Broadleaf	Corn spike to 5"[2]	0.5-1.0 pt	Not often used due to crop injury
BASIS	Broadleaf + Grass	Corn spike to 2-collar, 4-leaf	0.33 oz	COC 1-2 gal/100 + UAN 1-2qt/100[3]
BASIS GOLD	Broadleaf + Grass	Up to V6, weeds 1-3"	14 oz	COC 1-2 gal/100[3]
BEACON	Broadleaf + Shattercane	Corn 4-20", BL <4", grass <3"	0.38-0.76 oz	COC 1 qt[3]
BICEP II MAGNUM	Broadleaf + Grass	Corn up to 12"	2.1 qts[7]	none
BUCTRIL	Broadleaf	Corn 2-leaf to V6, BL 2-6"	1.0-1.5 pt	Not often used due to crop injury
CALLISTO	Broadleaf	Corn 0 – 30"	3.0 oz	COC 1 gal/100 28% 2.5 qts/100 or AMS 1%
CELEBRITY	Broadleaf + Grass	Corn 4-36"[5]	6.67 oz	NIS 1-2 qt/100 gal + UAN 2-4 qt/a[3]
CELEBRITY PLUS	Broadleaf + Grass	Corn 4-24"[5]	4.7 oz/a	NIS 0.25-0.5% + UAN 1-2 at/a[3]
CLARITY	Broadleaf	Corn 8-24"[2]	0.5-1.0 pt	Not often used due to crop injury
CONNECT	Broadleaf	Corn after emergence, prior to tassel	1.25-1.87 lb/a	COC 1% v/v
DISTINCT	Broadleaf/ Some grass	Corn 4-24"[2]	4-6 oz	NIS 1 qt/100gal + UAN 5 qt/100 gal[3]
DUAL II MAGNUM	Broadleaf + Grass	Layby	0.67-1.5 pt	none
EQUIP	Broadleaf + Grass	Corn V4 – 12"	1.50 oz	MSO1.5 pt + (UAN 2 qt or AMS 2lb)
EXCEED	Broadleaf	Corn 4-20", BL 2-12"	1.0 oz	COC 1 qt[3]
GLYPHOSATE[4]	Broadleaf + Grass	Corn up to 24"	24-42 oz	8.5 -17lbs AMS/100gal
HORNET	Broadleaf	Corn spike to 20", BL <8"	1.6-4.0 oz	NIS 1qt/100gal COC 1gal/100gal
HORNET WDG	Broadleaf	Corn spike to 20", BL , 8"	2.0 –5.0 oz	NIS 1qt/100gal COC 1gal/100gal
LADDOK S-12	Broadleaf	Corn <12", BL 2-4"	1.3-2.3 pt	COC 1 qt[3]
LIBERTY[4]	Broadleaf + Grass	Weeds 1-4"	24-28 oz	AMS 3 lb
LIBERTY ATZ[4]	Broadleaf + Grass	Corn <12"	40 oz	AMS 3 lb
LIGHTNING[4]	Broadleaf + Grass	Corn to 12", weeds up to 4"	1.28 oz	NIS 1qt + UAN 1-2 qt
MARKSMAN	Broadleaf	Corn before 5- leaf stage	2.0-3.5 pt	COC 1 qt[3]
NORTHSTAR	Broadleaf / Some grass	Corn 4-20"[5]	5 oz	NIS 1 qt/100 gal[3]
OPTION	Grass	Corn 0-16"	1.5 oz	MSO 1.5 pts 28% 1.5 qts or AMS 1.5 lbs
PERMIT	Broadleaf	Corn spike to 20", BL 2-6"	0.66-1.33 oz	COC 1 gal/100[3]
PROWL	Some Broadleaf + Grass unemerged	Corn spike to layby,	1.8-3.6 pt	none
PURSUIT	Broadleaf + Grass	Weeds <4"	4 oz	COC 1.5-2 pt + UAN 1-2 qt[3]
RESOURCE	Broadleaf	Corn 2-10 leaf, BL <4"	4-6 oz	COC 1 qt[3]
ROUNDUP WeatherMAX[4]	Broadleaf + Grass	Corn up to 24"	11-28 oz	8.5 -17lbs AMS/100gal
SENCOR	Broadleaf	Corn up to 8", BL 2-4"	1.5-2 oz	28%N 2-4 qt
SPIRIT	Broadleaf / Some grass	Corn 4-20"	1 oz	NIS 1-2 qt/100 + 28%N .5-1 gal
STEADFAST	Grass	Corn up to 12" or < 6 collar	.75 oz	COC 1 gal/100 gal, 28%N 2 qt
STEADFAST ATZ	Broadleaves + Grass	Corn up to 12"	14 oz	(COC or MSO 1gal/100 gal or NIS 1qt/100 gal) + (UAN 2qt or AMS 2lbs)
TREFLAN	Grass	Corn 2-leaf to layby; weeds unemerged	1.5-2.0 pt	None
2,4-D AMINE	Broadleaf	Spike to 8"	1-2 pt	Not often used due to crop injury

[1]Rates for additives are on a per acre basis unless noted
[2]Corn over 8 inches, use drop tips [3]Other additives may be used, check label [4]Requires herbicide resistant corn hybrid
[5]Corn over 20 inches, use drop nozzles [6]BL= broadleaf
[7]Do not apply over 3.25 qts/acre of Bicep II Magnum on a corn crop or apply more than 2.5 lbs active ingredient of atrazine on a corn crop.

Applying preemergence herbicides post: What's labeled and what's not

With the rainy weather, many producers may not have been able to spray their fields when they would have liked and now may be looking at whether they can apply their preemergence herbicides after the corn has emerged. Several preemergence herbicides are labeled for application after emergence without crop injury. The following table lists those herbicides along with crop stage and weed height restrictions. **Herbicides not listed can not be applied postemergence due to label restrictions.**

Many producers, especially those in no-till, also have been concerned that weed size may exceed the range of most preemergence herbicides by the time they are applied this year. Many of these products contain atrazine and have burndown properties. One can expect to control 4-inch broadleaf weeds at 1.5 lb and 2-3-inch broadleaf weeds with 0.75 – 1 lb. of atrazine.

Atrazine's postemergence activity can be increased by including an oil additive or applying with UAN as the carrier; however, you will not need both and adding oil to a mixture of fertilizer and atrazine will injure the crop. If you have planted Roundup Ready corn, you can add glyphosate to the mixture. Keep in mind that glyphosate activity may suffer when mixed with other herbicides or UAN so use the 1 quart rate. Another option with Roundup Ready corn would be to use Field Master, which contains both Harness Xtra and Roundup as a premix. Also, if you are considering adding 2,4-D to the mixture, the entire field should be at the spike stage to avoid injury to the corn.

Additionally, please note that Balance is not registered post-emergence. If used post-emergence, injury may occur. Also, DO NOT use Balance on lights sandy soils with low organic matter.

Also, crop oil concentrate (COC) can be added with some mixtures to enhance weed control but be sure to check the label as it may injure the crop.

Brady Kappler, Extension Weed Science Educator

Treatment	Crop stage *(in inches)*	Weed stage *(in inches)*
Aatrex/Atrazine	0-12	1.5[G]
Bicep II Magnum/ Cinch ATZ	0-5	2-leaf[G&B]
Bicep II Lite Magnum/ Cinch ATZ lite	0-5	2-leaf[G&B]
Bicep II Magnum FC	0-5	2-leaf[G&B]
Bullet	0-5	2-leaf[G&B]
Callisto[1]	0-30	0-5[B]
Degree	0-11	unemerged
Degree Xtra	0-11	2-leaf[G&B]
Dual Magnum	0-5	unemerged
Dual II Magnum/ Cinch	0-5	unemerged
Dual + Aatrex	0-5	2-leaf[G&B]
Expert[2,4]	0-12	weeds <6
FieldMaster[3,4]	0-11	weeds <6
G-MAX Lite	0-12	1.5[G&B]
Guardsman Max	0-12	1.5[G&B]
Harness/Confidence	0-11	unemerged
Harness Xtra/Confidence Xtra	0-11	2-leaf[G&B]
Hornet	0-20	2-6[B]
Keystone	0-11	unmerged
Keystone LA	0-11	unmerged
Lariat	0-5	2-leaf[G&B]
Lasso	0-5	2-leaf[B]
Lasso + Atrazine	0-5	2-leaf[G&B]
Lasso + Banvel	0-3	2-leaf[B]
Lead Off	0-8	1.5[G&B]
Lightning(IMI corn)	corn <8-leaf	weeds <3[G&B]
Lumax[1]	0-5	0-3[B]
Marksman	0-8	0-4[B]
Outlook	0-12	unemerged
Prowl + Atrazine	up to 2-leaf	1[G&B]
Python	0-20	2-6[B]
Shotgun	0-12	0-4[B]
Surpass	0-11	unemerged
Topnotch	0-11	unemerged

[1] Severe injury may occur if Callisto is applied postemergence to corn crops that have been treated with Counter or Lorsban. Do not tank mix with any organophosphate or carbamate insecticide. Do not cultivate within seven days of application.
[2] Do not tank mix this product with any other herbicide when applied postemergence.
[3] Do not mix this product with complex fertilizer mixtures such as 10-34-0 or flowables. Use only water or liquid nitrogen carrier.
[4] Apply this product to Roundup Ready corn only.
[G] Grass
[B] Broadleaf

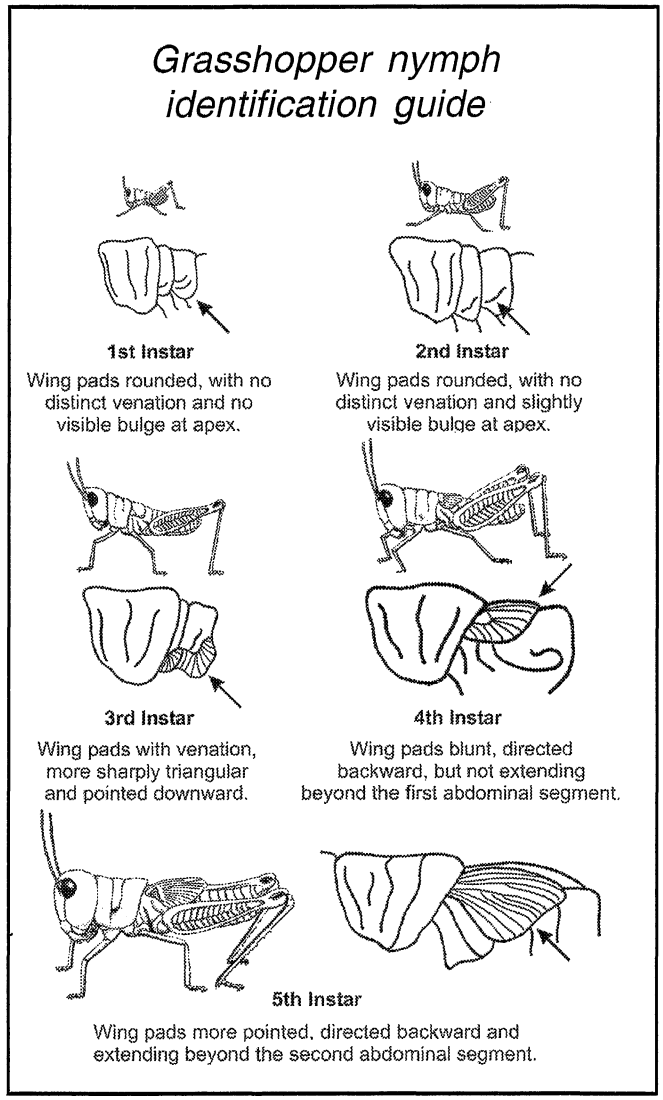
Identify species and stage and control early

Start scouting for summer-feeding hoppers

The major summer feeding grasshopper species will soon be hatching in rangeland, pastures and in areas around cropland. The eggs of these species usually start to hatch in mid to late May. The recent damp weather likely had a minimal effect on the survival of summer feeding grasshoppers. Grasshopper species that overwintered as nymphs were too large to be susceptible to wet conditions, and most grasshoppers that hatch in the spring were still in the egg stage, well protected from the weather. If rainy weather patterns continue through the end of May and into early June, the effect on spring hatching grasshoppers would be significant.

One of the bright spots of the recent rainfall has been the improvement in range and pasture condition. Cool season grasses have been growing rapidly and now may have a better chance to keep ahead of spring and summer feeding grasshoppers. Even though rangeland conditions have improved, it is essential that grass growth and grasshopper populations be monitored. Many of the state's grasslands are still suffering from the effects of drought, overgrazing and severe grasshopper infestations in 2002. These grasses need additional time to recover from the stress they have experienced.

With the high potential for a large number of grasshoppers and the fragile condition of grasslands, it will be important that producers start looking for hatching grasshoppers and identify problem areas. Collecting grasshoppers with a sweep net is the easiest way to determine where grasshopper hatching beds are located. After the hatching areas are identified, producers should determine the number of grasshoppers in a square yard. These counts are important to help determine the potential severity of an infestation. To estimate densities, identify a point at a distance of about 10 feet, visualize a square foot area around that point and, while walking toward the location, count any grasshoppers that move out of the area. It is important to check the vegetation in the square foot area carefully and count small grasshoppers that were not previously flushed from the area. The square foot count should be repeated 18 times in areas of different slope and vegetation. Divide the total number of grasshoppers counted in the 18 samples by two. This result is the number of grasshoppers per square yard. The procedure should then be repeated in different areas surrounding cropland or in different areas of rangeland and pastures.



There are over 100 species of grasshoppers in Nebraska. Of these only a handful are important pests of rangeland and pastures. Most of these grasshoppers feed exclusively on grasses and sedges and tend to be wasteful when they feed. They climb on leaf blades and clip them off, causing the blades to fall unconsumed to the ground. At high grasshopper densities, this clipping behavior results in a much greater loss.

Four species typically cause problems in crops. Although these grasshoppers will be found in pastures, they prefer to feed on a mixture of broadleaf plants and grasses. These grasshoppers can be abundant in weedy pastures or crop borders. When the weeds are either completely consumed or become dried down, the grasshoppers will move to adjacent crops and can cause severe damage. It is important to identify the species present because other rangeland and pasture infesting grasshoppers seldom move to crop plants to feed.

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Preparing for West Nile Virus in 2003

The question on many peoples' minds this spring is what will the status of West Nile Virus (WNV) be in Nebraska in 2003. Experts suggest it may be another year with many human and horse cases. This fast-moving disease spread from New York in 1999 west to Des Moines, Iowa in early 2002. Few anticipated that Nebraska would become the Midwest epicenter for the disease in 2002 with over 1100 positive horse cases in 92 counties and 174 presumptive and 152 CDC-confirmed human cases, eight of which resulted in death. Nebraska ranked 9th among 41 states reporting human cases, according to the Centers for Disease Control (CDC).

Fortunately, the rate of human infection for West Nile Virus is relatively low. People can only contract it if bitten by an infected mosquito. Only one out of five people bitten by an infected mosquito will have mild symptoms of the disease, such as headache, body aches and fever. Only one of 150 people will develop more serious symptoms, such as high fever, neck stiffness and paralysis due to brain inflamation. Older people and those with a compromised immune system are most likely to suffer severe disease symptoms. Birds, primarily crows and blue jays, and horses are the main animals suffering from the disease, although a few dogs, squirrels and other animal species also have been identified with it.

A vaccine available to protect horses is estimated to be 90-95% effective. Horses must be vaccinated twice about three weeks apart in the first year and at least once each year thereafter to provide protection from the disease. The vaccination or booster should be administered before the onset of vector mosquitoes.

Unfortunately, there is no vaccine to protect humans. Human protection depends on avoiding mosquitoes.

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Grasshoppers *(Continued from page 97)*

Producers also will need to monitor the growth of young grasshoppers, particularly if they are abundant. Grasshopper controls should target the 3rd and 4th instar nymphs (when they are about ½ to 3/4 inch long). Grasshopper nymphs are much easier to control than the adults because they can be killed with less insecticide. Also, adult grasshoppers are more mobile and more apt to spread, requiring controls over a greater area in order to protect crops and pastures. The growth stage of grasshopper nymphs can be determined by looking at the size of the individual and the length of the wing pads. The wing pads are posterior to the pronotum or saddle shaped structure just behind the head (*see figure on page 97*). The tips of the wing pads of 3rd instar nymphs point down and not toward the back. The tips of the wing pads of 4th instar nymphs point upwards and toward the back and do not extend beyond the 1st abdominal segment. With a little practice producers can easily see the wing pads and made a positive determination of the nymph growth stage.

Producers can protect their rangeland, pastures and crops if they survey their land for spring hatching, summer feeding grasshoppers. After the grasshoppers have gained some size (1/2 inch), the number of individuals per square yard should be determined as well as determining the growth stage and species present. Once this information has been gathered, producers can make informed control decisions based on established economic thresholds. These thresholds are available in two University of Nebraska NebFacts: *A Guide to Grasshopper Control in Rangeland*, NF97-329 and *A Guide to Grasshopper Control in Cropland*, NF97-328. (NF328 has been recently revised and will be rereleased in May.) These NebFacts are available from your local Cooperative Extension office or on-line.

The most important point to remember is that grasshoppers should be controlled well before they reach the adult stage.

For more information, check the NU Department of Entomology grasshopper Web site at *http://entomology.unl.edu.*

Ron Seymour, Extension Educator in Adams County
Gary Hein, Extension Entomologist Panhandle REC

Market Journal shows target gophers; refinancing ag debt

Pocket gophers can reduce forage crop yields, damage trees and shrubs, and burrow into underground cables and pipes. Their tunnels can divert irrigation water from its intended course and their mounds, when struck, can damage farm equipment. The May 16 "Market Journal Extra," a 30-minute NU Cooperative Extension video program hosted by Doug Jose, NU farm management specialist, will look at measures to control these pests.

The May 23 NU Market Journal will look at refinancing options for ag operations. David Goeller, NU beginning farmer program coordinator; and Cary Sandell, a Wells Fargo banker, will talk about why farmers and ranchers might want to consider refinancing certain kinds of debt.

Contact your local Cooperative Extension office or visit the Market Journal Web site at *http://marketjournal.unl.edu* for more information on accessing the program on-line or in person.

Inoculants offer yield advantage where soybeans are new to field

A recent study by Kansas State University Research and Extension scientists reinforces the importance of using soybean inoculant on fields to be planted to beans after several years of not having beans. Researchers also examined if an emergency nitrogen application could compensate for the lack of an inoculant.

"What we found was that without the bacteria Bradyrhizobium, which 'fixes' the nitrogen that plants utilize, soybean yields can be dramatically reduced," said Barney Gordon, agronomist-in-charge of the university's North Central Kansas Experiment Field.

Researchers studied the role of inoculants in fields at three sites: 1) near Scandia under irrigated conditions on Crete silt loam soil, nine years after soybeans were last planted; 2) on a dryland field near Manhattan on Wymore silty clay loam, five years after soybeans; and 3) in a Geary County field on a dryland Muir silty clay loam, where soybeans had been grown within the last two years. Depending on location, the study examined 6 to 13 inoculant treatments, including a no-inoculant check.

Treatment	*Yield*
Not inoculated - 0 nitrogen	39 bu/ac
Not inoculated - 60 pounds nitrogen per acre	44 bu/ac
Inoculated - 0 nitrogen	45 bu/ac
Inoculated - 60 pounds nitrogen per acre	47 bu/ac

Average yields for all treatments for the Scandia, Manhattan and Geary County sites were 67, 24 and 55 bushels per acre, respectively. (Hail damage at the Manhattan site reduced yields.) The no-inoculant check yields were 50, 24 and 55 bushels per acre, respectively.

In the field where soybeans hadn't been grown for nine years there was a 17 bushel per acre decrease without inoculants. In the two fields where soybeans had been grown more recently, there was no yield difference.

"There are some situations when seed should be inoculated even when soybeans have been previously planted," said Scott Staggenborg, northeast area Extension crops and soils specialist. "Those situations include when the field has been flooded, when the soil pH is very low, or if the soil is sandy with minimal organic matter."

A separate three-year study at the Northwest Research and Extension Center near Colby examined whether an emergency application of nitrogen would compensate for the lack of an inoculant. The study site was a field that had never been planted to soybeans. The researchers looked at four inoculant-nitrogen combinations.

Using an inoculant provided a yield increase of six bushels per acre in a field where soybeans had never been planted. The research also indicated that a rescue application of 60 pounds of nitrogen per acre would compensate for not planting inoculated soybeans.

"Based on these data," Staggenborg said, "if a farmer did not use an inoculant when one should have been used, added nitrogen fertilizer could eliminate most of the yield loss. This should be considered an emergency solution, though, because the cost of the nitrogen fertilizer is considerably more expensive than the cost of the inoculant."

Mary Lou Peter
Kansas State University News

West Nile

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Tips for avoiding mosquitoes

- Human exposure to mosquitoes is greatest at twilight so avoid mosquito-infested areas then.
- Wear light-colored clothing that covers the body, including the arms and legs. Mosquitoes are attracted to exposed skin and darker clothing.
- Use mosquito repellents, particularly those with N,N-diethyl-meta-toluamide (DEET). DEET provides protection from mosquitoes for three to five hours, depending on how much of the active ingredient is in the formulation. The higher the percentage, the longer the repellence lasts, up to a maximum of five hours. An insecticide, permethrin, can be applied to clothing but NOT to skin. It both repels and kills mosquitoes.

Tips for controlling mosquitoes

Mosquito control will lessen the potential threat to humans.

- Empty all containers holding water for more than a week, including bird baths, wading pools, ponds, house gutters and eaves and kids toys. Poorly drained areas that puddle, such as from machinery tracks, and discarded tires provide potential egg-laying areas for mosquitoes.
- Add fish or provide a means of agitation for small ponds to help reduce mosquito populations.
- Regularly treat with residual insecticides flowers, shrubs, evergreen trees and other vegetative areas that provide resting areas for mosquitoes.

In some farm situations where eliminating mosquito-breeding areas is not practical, such as near irrigated fields, a larvicide application may be an effective control method. Visit *cropwatch.unl.edu* for further information.

Jack Campbell, Extension Entomologist, West Central REC
David Keith
Extension Entomologist

Use soil tests to determine manure availability

One of the unknowns about manure use as a fertilizer is how quickly nitrogen is released from the organic material in manure. This nitrogen is not found in fall, winter, or early spring soil tests. Soil temperature, moisture and aeration influence how fast nitrogen is released from manure. Usually most nitrogen is released from manure in late spring when conditions favor release. Given the dry season last year and the rain we have had in the spring of 2003, mineralized nitrogen release should be higher than normal. For those who found high levels of nitrates in fall and winter soil samples, this is a way to verify that nitrogen levels are still above normal.

The Pre-Sidedress Nitrate Test (PSNT) for corn was developed to test soil for nitrate nitrogen that becomes available in late April and May. The University of Nebraska has not yet published specific recommendations for the PSNT, but guidelines developed by Iowa State University may be used. Their guidelines are available in *Nitrogen Fertilizer Recommendations for Corn in Iowa*, ISU Cooperative Extension publication Pm-1714, which is available on the Web at *http://www.extension.iastate.edu/Publications/PM1714.pdf*

Sample corn when it is 6 to 12 inches tall or in late May to early June. Sample from field areas that are similar and 10 to 20 acres in size. Sample from the surface to one foot deep. Have the sample tested for nitrates. The results will be reported in ppm (parts per million). This test works best if previous fertilizer application bands are avoided. Try to avoid starter and anhydrous ammonia bands. Take 20 cores per sample.

Interpreting the results -- the Iowa method

Iowa has the most specific recommendations. They are based on the price of corn and nitrogen, spring rain, and the PSNT results. When corn is about $2.00/bu and nitrogen ia over $0.25/lb, use the upper section of the table (*below*). This table should be used only for fields with manure or alfalfa history.

For fields in continuous corn or corn following soybeans: ISU recommends subtracting the soil nitrates (ppm) from 25 and multiplying the difference by 8. For example: with a soil test of 18 ppm nitrate-N the nitrogen recommendation would be: 25-18=7 x 8= 56 lbs N/acre.

Recommendations

Sample corn fields with a high likelihood of having high nitrate concentrations such as: manured fields and those with alfalfa last year. If soil tests come back over 23 ppm nitrates, there is probably no need for additional nitrogen. The NU corn nitrogen recommendation formula was developed for preplant soil samples to 24 or more inches. It is not intended to be used with the PSNT numbers in the table below. However, the formula does give eight pounds of nitrogen credit for each ppm nitrate. If previous fertilizer bands were avoided in the sampling, and more nitrogen is recommended, then reduce the additional nitrogen needed by the amount of the band application. Broadcast nitrogen applications will become part of the soil nitrates; so do not subtract broadcast applications from the predicted nitrogen needs.

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Nitrogen fertilizer recommendations for manured soils* and corn after alfalfa. (From ISU Cooperative Extension publication, *Nitrogen Fertilizer Recommendations for Corn in Iowa*).

Grain and fertilizer prices	Soil test nitrate	Recommended N rate	
		Excess** Rainfall	Normal Rainfall
	ppm N	----- lb. N/acre -----	
Unfavorable	0-10	90	90
(1 bu buys	11-15	0	60
7 lbs. of N)	16-20	0	0***
	> 20	0	0
Favorable	0-10	90	90
(1 bu buys	11-15	60	60
15 lbs. of N)	16-25	0	30
	> 25	0	0

* A field should be considered manured if animal manures were applied with a reasonable degree of uniformity since harvest of the previous crop or in two of the last four years.

** Rainfall should be considered excess if rainfall in May exceeded five inches [in Iowa].

*** Adding 30 lbs. N/acre may have no detectable effects on profits, but producers could reasonably elect to apply this rate.