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CROP WATCH

University of Nebraska Cooperative Extension
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Assessing winter wheat stands and estimating yield potential

The winter wheat growing regions of Nebraska are characterized by large fluctuations in weather conditions, particularly temperature and precipitation. Winter wheat often suffers as a result of these fluctuations. Wheat growers are frequently confronted with the need to estimate wheat yields in the spring to decide about potential recropping. Determining a reasonable estimate of wheat yield allows growers to predict if it is in their best interest to destroy their wheat and plant a summer crop or leave the wheat for harvest. Before making such a decision, growers should be aware of any restrictions imposed by government programs, crop insurance, or previous herbicide use.

There are several methods of estimating winter wheat yield potential. Two are discussed here. Each method relies on several assumptions that may not be accurate for every season or situation. These assumptions presume that soil moisture and nutrients are adequate, and that weeds, insects and disease are not affecting yields. Added to the uncertainty of yield estimates is wheat's ability to compensate for changes in the environment.

Method 1

Table 1 is easy to use; however, it relies on several assumptions that are required to make a yield estimate in the fall or early spring prior to extensive tillering or stem elongation. These assumptions include:

1. That the wheat plants, on the average, develop about five heads;
2. That each head, on average, develops about 22 kernels; and
3. That there are an average of 16,000 kernels per pound.

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Inside

Focus on wheat

This issue of *Crop Watch* features a variety of stories on winter wheat production and pest management. In 2001 Nebraska ranked seventh nationally in production of winter wheat with 59,200,000 bushels. USDA reports that this year 1,700,000 acres were planted to winter wheat in Nebraska.

Dry winter may lead to disease problems in western wheat

Assessing early disease problems in mid-March is difficult because the wheat has not broken dormancy. Moisture stress through the winter in many areas of the state this year could lead to crown and root problems as the crop "green ups" in April. The plants that I have examined were from eastern Nebraska and showed healthy crowns and roots. However, the area of concern is the Panhandle and west central Nebraska where drought and lack of snow cover have been the norm this year. These conditions often predispose plants to winter injury and root and crown rot.

Fields affected by crown and root rot will show uneven "green up" with areas of healthy plants and areas of stressed or dead plants. The pattern of crown and root rot often follows areas with looser seed beds or exposed, windy sites. Affected plants may initiate growth, but decline rather quickly because of rotted crowns and roots.

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Updates

Management tips
March 15-30

♦ **Spring planted small grain** such as wheat, barley, oat, and canola should be planted as soon as field conditions allow.

♦ **Many irrigated wheat fields** in western Nebraska are extremely dry and unless significant moisture occurs soon, early irrigation would be beneficial.

♦ **Scout winter wheat fields** for winter broadleaf weeds such as field pennycress and tansy mustard. Significant infestations should be sprayed by April 1 to maximize control and limit yield losses.

♦ **Delayed greenup of alfalfa and wheat may indicate the presence of cutworms.** Scout fields and treat if necessary. Treatment thresholds are from two to four cutworms per square foot of cropland. For more information, see *Management of the Army Cutworm and Pale Western Cutworm*, NebGuide G1145, on-line at *http://www.ianr.unl.edu/pubs/insects/g1145.htm.*

Recent publications

The following publications were recently revised or newly published and are available from your local Cooperative Extension Office. Most of these also will be available on the Web in the near future at: *http://www.ianr.unl.edu/pubs*

♦ *Nebraska Proso, Sunflower, Pulse Crop, Amaranth, Oat and Spring Wheat Variety Tests 2001,* NU Cooperative Extension EC01-107.

♦ *Manure Testing: What to Request,* NF 507. This publication also includes a form which can be copied and used to submit a manure sample to one of the labs listed.

♦ *Creating a Strong Family -- American Family Strengths Inventory,* NF01-498

♦ *Nutrient Content and Sensory Characteristics of Bison Meat,* NF01-502

Ag meeting

The 2002 Nebraska Range Shortcourse will be held at Chadron June 23-38. This week-long, intensive course in range management emphasizes range soils, range plant physiology, range ecology, plant identification, utilization, monitoring species composition, range condition and health, rangeland uses, livestock grazing programs, range wildlife and many other topics. It includes classroom teaching in the morning and hands-on learning experiences through field trips and field exercises in the afternoon.

For more information, contact Lowell Moser, NU agronomy professor, at (402) 472-1558 or email *lmoser1@unl.edu.*

News

♦ **Seed quality**: Unlike last year, seed quality does not appear to be a problem for most corn or soybean seed this year, according to Steve Knox, manager of the Nebraska Crop Improvement Association. Germination percentages of seed tested over the winter were generally in the 90s, he said. Last year these scores were almost unheard of, with seed often testing in the 70s and 80s.

♦ **"Backyard Farmer" moves to Thursday nights April 4:** In its 49th season, the hour-long program will air at 7 p.m. (CT) on Thursdays April 4 through Aug. 29 on the Nebraska Educational Television Network. It also will be rebroadcast on NETV2 at 9 a.m. and 1:30 p.m. Friday and 10:30 a.m. Sunday

"Backyard Farmer" features NU extension specialists and other experts discussing and demonstrating garden topics such as pest management, landscaping and other issues related to the home landscape environment. A gardening calendar each week will help viewers prepare for specific things that happen during the gardening season.

Thanks!

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Assessing wheat *(Continued from page 11)*

Table 1. Estimated wheat yield potential.

Row spacing -- inches--	*Number of plants/foot of row*											
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
						-- bushels/acre --						
6.0	10	20	30	40	50	60	—	—	—	—	—	—
7.5	8	16	24	32	40	48	56	64	—	—	—	—
9.0	7	13	20	27	33	40	47	54	60	—	—	—
10.0	6	12	18	24	30	36	42	48	54	60	—	—
12.0	5	10	15	20	25	30	35	40	45	55	50	60
14.0	4	9	13	17	32	26	30	34	39	43	47	52

Late-planted wheat and wheat seeds that do not germinate until later because of dry conditions will tiller less and have fewer heads.

Table 2. Estimating winter wheat yield after stem elongation for the Nebraska Panhandle.*

Row spacing -- inches --	*Number of tillers/foot of row*											
	10	*15*	*20*	*25*	*30*	*35*	*40*	*45*	*50*	*55*	*60*	*65*
						-- bushels/acre --						
6.0	22	34	49	56	67	79	90	101	112	—	—	—
7.5	18	27	36	45	54	63	72	81	90	99	118	---
9.0	15	22	30	37	45	52	60	67	75	82	90	97
10.0	13	20	27	34	40	47	54	61	67	74	81	88
12.0	11	17	22	28	34	39	45	51	56	62	67	73
14.0	10	14	19	24	29	34	38	43	48	53	58	63

*See story for how to use this table for other areas.

To use *Table 1*, count the number of plants per foot of row. It is best to use at least 5 feet of row in at least five sites within the field and calculate the average number of plants per foot of row. If the stands are uneven, for example the stand is better or worse in the wheel tracks, make sure your percentage of samples in these areas accurately represents the proportion of these areas in the whole field. Locate the column in the table that corresponds to your average number of plants per foot of row and then move down that column until it intersects with the row corresponding to your row spacing. This is your estimated yield.

Method 2

Table 2 was developed using data from 1994 to 1998 as part of the Nebraska Wheat Quality Tour. These tours were conducted near May 1, prior to head emergence in most of the state. Factors such as heavy weed/disease/insect infestations or inadequate soil moisture at the time of the tour may suggest fewer final heads and a lower yield potential than indicated in the table. In addition, the table becomes unreliable in situations of extremely low or extremely high tiller counts, or in years when crop development as of May 1 is well ahead or behind normal. For later season yield estimates, yield predictions can be made by substituting the actual number of heads per foot for tillers per foot.

To use *Table 2*, count the number of tillers per foot of row. Again, it is best to use at least 5 feet of row in at least five sites within the field and calculate the average number of plants per foot of row. Be sure you sample sites representative of the field. Locate the column in the table that corresponds to your average number of tillers per foot of row and then move down that column until it intersects with the row corresponding to your row spacing. This is the estimated yield.

The table was developed using data collected in the Nebraska Panhandle. For other Nebraska locations, multiply the yield in the table by the following factor:

Southwest Nebraska – 0.9
Central and south central Nebraska -- 0.85
Southeast Nebraska – 0.75

Although these multipliers may appear to be in error – everyone knows that wheat fields in the semi-arid Panhandle usually yield less

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Inspect wheat for early season insect problems

Winter wheat insects are often sporadic in occurrence and difficult to scout; however, early scouting is important since several insects can quickly develop into a problem if not detected early. Army cutworms are often the first insects to be found in wheat fields. Army cutworms are likely to be the only larval cutworm found this early in the spring. The larvae hatch from eggs in late fall or winter and feed throughout the winter when conditions are favorable. They are partially grown when wheat begins to regrow in the spring. These insects are already being reported in southern Kansas. High populations can reduce the foliage on regrowing wheat. Impact will be more significant on wheat that is regrowing slowly. Thresholds vary from four or more per square foot for vigorously growing wheat to two or more per square foot for thin or stressed wheat.

Another insect whose level of risk should be established early in the spring in western Nebraska is the Russian wheat aphid. This aphid did not survive well through the warm dry summer last year and was difficult to find in fall; however, because of the extended warm fall and winter, aphid populations may have regained a foothold in some areas. It's important to inspect plants for this insect now because of its potential for extreme damage. Early spring thresholds range from about 10-25% infested tillers, depending on yield potential and control costs.

Warm dry conditions across much of the western wheat growing areas of Nebraska may increase populations of the brown wheat mite. These small, rusty-brown mites feed on wheat leaves, causing a yellowish discoloration and spotting. The mite is active through most of the winter and early spring when temperatures are favorable. As warm summer-like temperatures return in spring, they become less active. Brown wheat mites will be most numerous under extremely dry conditions and often are associated with drought-stressed wheat.

Any decision to treat is difficult. If rains don't occur, the stressed wheat will likely do poorly, but if significant rains occur, mite populations will be significantly reduced. Extreme mite populations may warrant treatment to keep plants alive until they can get adequate rainfall. Treatments with dimethoate or Lorsban 4E-SG should provide enough control to limit populations.

Gary Hein, Extension Entomologist, Panhandle REC

Assessing wheat

(Continued from page 13)

than fields to the east – on a per head basis the multiplier is correct. Wheat fields in the sub-humid portions of the state produce more heads/acre, but typically fewer kernels/head than in the Panhandle.

For example, if your winter wheat field is in southwest Nebraska and you have an average of 30 tillers per foot of row, and your row spacing is 10 inches, multiply the table results of 40 bushels/acre by 0.9 to get a yield estiamte of 36 bushels/acre.

Robert N. Klein, Extension Cropping Systems Specialist West Central REC

Wheat production handbooks on-line

For further information about growing wheat in Nebraska, NU Extension specialists have prepared a handbook of wheat production systems. It is available on-line at *http://www.panhandle.unl.edu/personnel/lyon/wheathbk.htm* A site is also available with information on growing hard white wheat at *http://www.hardwhitewheat.unl.edu*

Wheat disease outlook *(Continued from page 11)*

Growers that are concerned about their wheat can check its health by digging plants and examining the roots and crowns. Remove the soil from the roots, check the color -- they should be white not brown. Slice through the crown; healthy crowns are white; infected ones are tan to brown. The greater the discoloration in the crown the less likely the plant is to survive. You can also check plants by placing them in a glass of water where they should produce new roots from the crown in four to five days. Of course diseased or dead plants will not initiate new roots in the water glass.

Don't be too quick to write off the field. Sometimes fields that look marginal in March can bounce back in April and ultimately produce a decent wheat crop. Refer to the "Assessing Winter Wheat Stands" article on pages 11, 13-14 for guidelines on assessing your stands.

Regarding other wheat disease issues, reports from southern Texas indicate that leaf rust and stripe rust are at higher levels there than they were at this time in 2001. Be aware of this situation, but don't get overly alarmed since it is much too early to assess the rust potential for Nebraska. The development of both rusts in Texas, Oklahoma and Kansas will be monitored, and if necessary, growers in Nebraska will be alerted in May in time to treat their wheat.

John E. Watkins Extension Plant Pathologist

Controlling broadleaf winter annuals in wheat

Winter annual broadleaf weeds have the same life cycle as winter wheat and compete with the crop through most of its growing season, often causing greater yield losses than annual broadleaf weeds. It's estimated that if winter annual weeds are not controlled in a timely way, they can reduce wheat yields by an average of 10%.

These weeds include field pennycress, blue mustard, tansy mustard, tumble mustard, and shepherdspurse. Fields should be checked early for these weeds since they are much easier to control when small and because the earlier they are controlled, the less impact they will have on crop yields. Once these weeds bolt or the stems elongate -- usually in late winter or very early spring, depending on weather and location -- they are very difficult to control.

Blue mustard is the most difficult to control because it bolts early. Applying an appropriate herbicide when the weed is still in the rosette stage provides good control. The most effective treatments have been Ally + 2,4-D, Amber + 2,4-D; and Peak + 2,4-D. Several other treatments also are effective when application is timely. Check page 58 of the *2002 Guide for Weed Management in Nebraska* (Extension publication EC02-130) for weed response to postemergence herbicides in winter wheat. The Guide is available at Extension offices throughout the state or on the Web at *http:/www.ianr.unl.edu/pubs/fieldcrops/ec130.htm.*

Always check rotational restrictions before selecting a treatment. A newly revised and expanded table of replant options and rotational restrictions is on page 102 of the Guide.

2,4-D provides good control of many of the winter annual broadleaf weeds if application is timely, but only fair control of blue mustard. Adding a sulfonylurea herbicide improves control of many weeds and also provides residual control with most of the S.U.'s. This can help control early emerging summer annuals such as kochia if they aren't ALS-resistant.

The bottom line is that winter wheat growers need to scout their fields in late fall or winter to determine if they will need to control winter annual broadleaf weeds in late February or early March in the case of blue mustard, or in March or early April for other winter annual broadleaf weeds. Once plants begin flowering above the wheat crop, it's probably too late for this year. If timed correctly, 2,4-D (8 oz/acre of LV4 ester or 16 oz/acre of 4 lb/gal amine) provided low-cost and effective control of many weeds. Check the weed response table for your weeds. Be sure that wheat has at least four tillers before application

If winter annual broadleaf weeds are a regular problem, change the crop rotation. Including a spring-seeded crop such as corn, sorghum, soybean, oat, proso millet, or sunflower in the rotation with winter wheat-fallow provides an additional year in which to prevent seed production and allows the soil seedbank to gradually decrease. Additional information or blue mustard can be found in the NU NebGuide, *Blue Mustard Control.*

Robert N. Klein, Extension Cropping Systems Specialist West Central REC

USDA: Alliance most popular wheat in the state

Alliance was the most popular winter wheat variety planted for the 2002 crop year in Nebraska for the second year in a row, according to USDA's Nebraska Agricultural Statistics Service. It was first planted in Nebraska in 1994 and has steadily increased in popularity. For the 2002 crop, Alliance accounted for 16.6% of the acreage.

Arapahoe accounted for 13% of the acreage and remained second after falling behind Alliance last year. The variety Pronghorn was third with 10.8% and the variety 2137 was fourth with 8% of the state total. Hard white winter wheat accounted for less than 1% of the total.

Alliance was the most popular wheat variety in northwest Nebraska where over 44% of Nebraska's wheat acres are. It was a close second to Arapahoe in the southwest, but was hard to find in the south, eastern and southeast reporting districts. Arapahoe was most popular in the central, east and southwest districts and second most popular in the south.

Variety 2137 topped the list in the south while Karl was most popular in the southeast. Pronghorn's strong third place showing was due to its popularity in the northwest and southwest. Buckskin was third most popular in the northwest, making it sixth overall.

This wheat variety data was based on reports from almost 600 producers, representing 10% of the state's wheat acreage.An expanded report is available from Nebraska Agricultural Statistics at: (402) 437-5541.

Market Journal

Video discussions related to agricultural risk management are available on the Web at *http://marketjournal.unl.edu* The Feb. 14 broadcast, which is now available, addressed grain marketing strategies in light of current market conditions.

Countering wind erosion in growing winter wheat

Wind erosion in growing wheat is becoming a substantial problem in parts of southwestern Nebraska, the southern Nebraska Panhandle, and northeastern Colorado. Frequent wind and very little moisture this winter have made wind erosion more severe than normal.

How can we stop or reduce wind erosion in a field of growing winter wheat? There are several options. If we do nothing and the wind and soil erosion continue, it's likely that the wheat in some parts of the field will be killed. Soil will be lost from already vulnerable spots in the field and end up in fence rows and roadsides — not good environmental stewardship. Two better options are to apply livestock manure or to employ emergency tillage. A heavy application of coarse manure can very effectively stop soil erosion. Apply manure over and upwind from the eroded area.

If the soil surface is not frozen, emergency tillage is an option effectively used by many wheat growers. Use an implement with shanks spaced 48-60 inches apart. Use narrow chisel or shovel points that create small ridges and bring soil clods to the surface. Drive at a field speed and use a tillage depth that create surface clods. Drive perpendicular to the direction of the prevalent winds and begin upwind from the area of active soil erosion. If soil erosion continues days or weeks later, till deeper in the same shank marks to bring up new clods, or, as a last resort, make new shank marks between the first marks. Tillage will be more effective if started before soil erosion becomes severe.

Will emergency tillage damage the growing wheat? If the shank marks can be made at the appropriate spacing and at an angle to the rows of wheat, it will be far less damaging than doing nothing. Only a small percentage of wheat plants will be removed or covered deep enough to be killed. Data from a five-year study at two Kansas sites suggests this type of emergency tillage has minimal effect on potential yield while reducing damage to the growing wheat and reducing soil erosion in moderate erosion situations. This study found that emergency tillage caused the most damage to wheat yields when the wheat had just emerged. The least yield reduction was found when the tillage was in fields with wheat plants already tillered.

Tillage can be used as an emergency measure to stop wind erosion in growing wheat. Use an implement with narrrow chisel or shovel point shanks spaced 48-60 inches apart and drive perpendicular to the direction of the prevalent winds.

For more information on emergency wind erosion control, see University of Nebraska NebGuide G75-282, *Emergency Wind Erosion Control,* available from your local Cooperative Extension office or on the Web at *http://www.ianr.unl.edu/pubs/soil/g282.htm.*

John A. Smith
Machinery Systems Engineer
Panhandle REC

On-line NU information resources

The NU Institute of Agriculture and Natural Resources (IANR) offers many information resources on-line so they're available to readers 24 hours a day, seven days a week. Many resources link from the IANR home page at *http://www.ianr.unl.edu*

More than 800 NU Cooperative Extension publications are available on-line at *http://www.ianr.unl.edu/pubs*

Individual departments, centers or researchers also have developed sites on particular topics. To locate them, use the IANR search engine at: *http://ianrhome.unl.edu/search.shtml*

Providing security for ammonia tanks

Soon Nebraska's rural landscape will be scattered with anhydrous tanks, a welcome reminder of spring for farmers and a welcome opportunity for theft to those needing anhydrous ammonia to illegally manufacture methamphetamine.

A synthetic drug, methamphetamine is a powerful stimulant of the central nervous system which has a high potential for dependence. While 85% of Nebraska's "meth" comes from outside the state, there has been a huge increase in the number of meth labs being found throughout the state in the last two years, according to Sgt. Glenn Elwell, clandestine lab coordinator for the Nebraska State Patrol.

Law enforcement control of the problem is particularly difficult, given that the value of the actual theft of ammonia is minor -- sometimes just a few dollars. However, the contributory impact of the theft can be quite costly in both human and financial losses.

While many of the ingredients for methamphetamine can be purchased in a local farm or discount store, one of the key ingredients – anhydrous ammonia – often is stolen from tanks at local distributors or farms.

For two months each spring, Elwell says the number of complaints of ammonia theft and tank tampering at co-ops drops dramatically. That's when thieves are likely accessing ammonia tanks at farm sites, he said.

"We need to become much more security minded with these tanks. We have to take on the responsibility of thinking about what has to be done to keep someone from stealing ammonia from this tank."

Information developed and distributed by Agriliance in cooperation with the Midwest High Intensity Drug Trafficking Area suggests several steps fertilizer dealers and farmers can take to reduce ammonia thefts. First of all, it's important to recognize the signs of theft and to report incidents. If a thief has been successful at a site once, he or she is apt to return. Tire or foot prints around tanks or leaking tanks indicate someone's been there, as well as buckets or coolers, duct tape, garden hoses or bicycle inner tubes, all of which may be used to drain ammonia and then discarded at the site.

To discourage theft, agribusinesses can:

- store tanks in a well-lit area (adding motion detector lights is relatively inexpensive and extends security);
- enclose tanks in a locked, storage area (Elwell suggests using a 10-foot wire fence topped with barbed wire);
- install valve locks and covers when possible.

Working with Farmland Industries Inc to develop a design, Dodge Manufacturing (785-266-5100) is producing three sizes of covers and locks for anhydrous ammonia tanks. Other companies may have developed similar devices. Details of the Dodge product are available on the Web at *http://www.dodgeandco.com/TankLock/TankLock.html* Cost is estimated at $89. In some states groups have received grant funds to buy tank locks.

Producers also can take steps to discourage theft:

- take delivery of tanks just before you expect to use them and return them as soon afterward as possible;
- place tanks in easily observed areas;
- bleed pressure and remove tank hoses when not in use; one hose contains enough ammonia to make a batch of meth;
- if you own your own nurse tank, add a lock and cover.

Abandoned farm houses and barns are particularly appealing for meth production, Elwell said, because production generates a strong smell which can dissipate more quickly in the country. He encouraged rural residents to be alert to signs of production on abandoned farmsteads and to contact local authorities. Signs might include suspicious vehicles or activity and large amounts of trash, such as discarded antifreeze and drain cleaner containers, duct tape, or lantern fuel cans.

Lisa Jasa
CropWatch Editor

Delay selling extra hay supplies

Selling extra hay usually is a good idea. Old hay that is kept an extra year often will lose about 15% of its total weight due to weathering. Total digestible nutrients (TDN) and crude protein also decline and some of the hay can begin to mold or rot. This year, however, may be the year that it pays to hold onto your extra hay.

If you're like most folks, you don't have much moisture in your soil and if there aren't some good early spring rains, pastures may not grow very fast. And, it's going to take a lot more rain to keep pastures growing through the summer.

What do dry soils this early in the year mean for hay production this year? Forecasters are telling us the the new 'el nino' developing in the Pacific may mean drier, hotter times for western Nebraska. That extra hay you were planning to sell might turn out to be a lifesaver if these forecasts come true. Only you know how much hay you should keep to protect your feed needs.

Bruce Anderson
Extension Forage Specialist

Testing soil for pH

Site specific or variable rate application of lime is often profitable since lime application is costly and lime needs can vary greatly across fields. Soil samples taken at 0-8 inches need to be tested to determine the lime requirements for different parts of the field.

There are three basic soil sampling strategies for determining lime requirement.

1. With the traditional strategy, soil samples are taken for areas of 40 acres or less. Use this approach when there is no reason to suspect much variation in lime requirement across the field. If the lime requirements indicated by the soil tests differ much, consider using a management zone strategy or grid sampling.

2. With a management zone strategy, a field is divided into smaller areas for sampling based on factors likely to affect lime requirement.

3. With grid soil sampling, a sample is taken for every 1 to 2.5 acres (depending on how much variation is expected) and a map is produced showing lime requirements. Grid sampling may be preferred if much variation is expected and there is not a good basis for zoning the field.

Traditional sampling is the least costly and grid sampling is the most costly method.

Several factors may cause variation in lime requirements and may provide a basis for zoning a field. Lime requirement may be greater if:

1. some parts of the field have been used for crop production longer than other parts;

2. some areas received more nitrogen fertilizer over the years than other areas; and

3. the same fertilizer nitrogen rate was applied across the field, but yields and nitrogen recovery were less in some parts of the field.

Lime requirement may be less in some areas than other areas if:

1. they received much manure application over the years;

2. irrigation was with water high in calcium carbonate; and ; and,

3. an old farm place was present.

Variation in mean yields over years, especially for legumes, may indicate variation in soil pH.

With fine-textured soils, lime requirements often vary with topographic position. Less lime is generally required on bottomland, more on hillsides and the most on hilltops. Steeper hillside slopes often require less lime than gentler slopes. Also, some soil series may have a greater lime requirement than others; for example, the requirement for Nora and Geary has been found to be generally greater than for Wymore and Pawnee in southeast Nebraska, while Adair, Crete, Sharpsburg, Moody and Marshall were typically found to have intermediate requirements.

Once zones are defined and sampled, the soil test results need to be considered to determine if site specific application is justified.

The results of grid sampling need to be considered to determine if:

1. variable rate application is justified;

2. lime should be applied by zones in a site specific manner, but with conventional application equipment; or

3. the whole field should be treated the same.

Charles Wortmann, Extension Nutrient Management Specialist

Economics of using pel-lime versus ag lime

Assume a case where a soil needs amendment within two years to prevent yield loss due to acidity and the equivalent of 3600 lb of calcium carbonate will have to be applied over 20 years to avoid yield loss. This will require a total of 4000 lb of 90% ECC pel-lime and 6000 lb of 60% ECC ag lime. Also, assume that interest rates are 8% and that pel-lime costs $65 per ton, including transportation and application costs, while ag-lime costs $20 per ton.

If pel-lime is applied at the rate of 400 lb/A every other year beginning in Year 1, the total cost over 20 years will be $334 per acre. If 3000 lb of ag lime is applied in Year 1 and 3000 lb is applied in Year 9, the cost would be $210 per acre.

Charlie Wortmann, Extension Nutrient Management Specialist

Wheat condition reports

David Baltensperger, Extension Crop Breeding Specialist, Panhandle REC: Winter wheat condition is continuing to decline in areas of the Panhandle. While some areas have received snow or precipitation which has been helpful, many areas remain short of moisture. We've had several cycles of warm to cold weather with very low humidity and high winds that have caused severe browning, putting the wheat in a fairly precarious state. Fortunately, with timely March rains, the wheat could recover rapidly.

Roger Elmore, Extension Crops Specialist, South Central REC: Wheat in south central Nebraska had lots of fall growth and was in excellent shape as it went into dormancy last fall. It is too early to tell with any certainty how different cultivars survived the winter.

Noel Mues, Furnas County Extension Educator: Winter wheat went into dormancy last fall in good to excellent condition where it was planted into a well prepared, firm seedbed. Furnas County and much of the surrounding area received about 1 inch of rain last November, during Thanksgiving, and about 10-12 inches of snow on January 31. The snow came with very little wind and provided insulating cover and beneficial moisture. Varieties developed by the University of Nebraska have a high level of winter hardiness and can tolerate this dry, open winter weather much better than less hardy and less adapted varieties.

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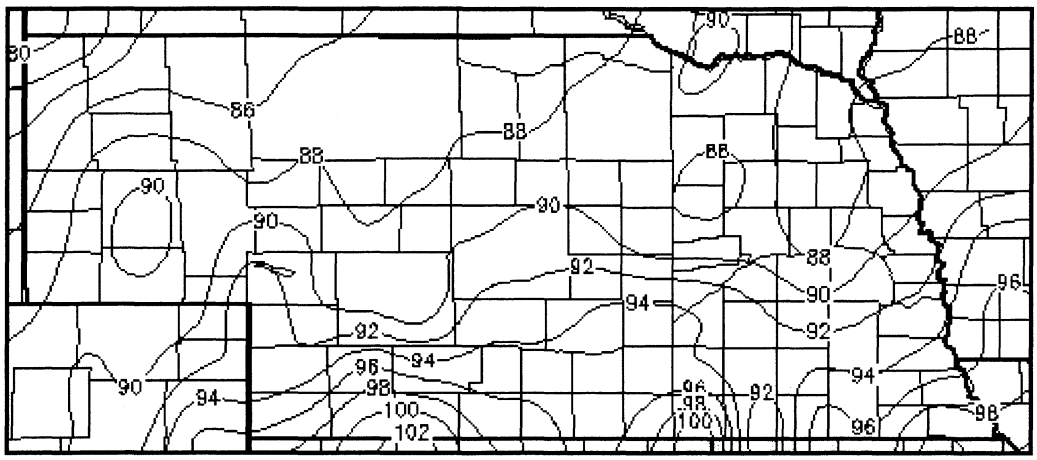
Corn flea beetle survival expected to be above average in southern Nebraska

Due to the mild winter weather, corn flea beetle survival is expected to be average or above average this year. This projection is based on the sum of the monthly average temperatures for December, January and February.

If it is greater than 98° F, overwinter survival of flea beetles is expected to be high. If it is less than 80° F, survival is expected to be below normal. Based on the accompanying map for Nebraska, except for pockets of southern Nebraska, most areas of the state did not exceed 98°. Although conditions in parts of southern Nebraska were favorable for overwinter survival of flea beetles, it does not necessarily mean that flea beetle numbers will be high, since flea beetle numbers were generally not economic in many areas of Nebraska in 2001.



This map shows the total average temperatures for December, January and February. Areas where the average is above 98° F may see high winter survival of the corn flea beetle while areas from 80° F to 98° F are expected to see normal survival. 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)*

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 (See NebFact 01-473 for more information on Stewart's wilt).

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 compay representative).
- Avoid early planting dates if susceptible inbreds or hybrids are planted.

Seed treatments containing imidacloprid (Gaucho, Gaucho Extra and Prescribe) 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. 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.

A variety of foliar insecticides are effective in controlling flea beetles (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 T 2.56-3.84 fl. oz per acre).

Bob Wright
Extension Entomologist
South Central REC

Wheat condition *(Continued from page 18)*

Larry Peterson, Keith-Arthur-Perkins County Extension Educator: There has been some wind erosion in a few fields, but overall most have withstood the winter winds so far. We did get 2-3 inches of snow March 1 in Perkins County which helped to protect the wheat from the sudden drop in temperature and high winds.

Keith County did not get much snow at all so most of the fields there were exposed during the cold and wind. The winter has been very dry and we have had periods of above normal temperatures. Moisture was good at planting and most fields have good stands from good fall growth.

Cost effective options

Using lime to amend acid soils

There has been a big increase in lime use in eastern Nebraska in recent years to amend acid soils. Soil acidification on fine textured soils is generally a slow process and is largely due to use of nitrogen fertilizers and inefficient recovery of fertilizer nitrogen. Crop growth is most affected by soil acidity through reduced nutrient availability, reduced nitrogen fixation in legumes, and, in some cases, toxicity problems.

Soil pH is a measure of active acidity in the soil and is used to determine if there is a problem. Soil is tested for buffer pH to determine the amount of lime needed to correct the acidity problem.

See page 18 for tips on sampling soil for lime and the economics of various options.

Thresholds of soil pH for profitable response to lime application over a 7- to 10- year period are: 6.0 for alfalfa; 5.5 for soybean; and 5.1 for corn. Two or more years may be required to adjust soil pH. If alfalfa is to be established on acid soil, lime should be applied a couple of years before sowing, especially since alfalfa is sensitive to soil acidity during establishment.

Liming is a long-term investment and seven to eight years is commonly required to recover the investment. In a trial conducted in Washington County, it took seven years to recover the investment with an 8% interest rate (*Figure 1*). Producers may not want to invest in lime use when land rental arrangements for eight or more years are insecure.

Because of the delay in payback on the investment, interest rates become very important as $100 obtained at 7% interest costs $197 over 10 years while the cost is $237 if the interest rate is 9%.

The long-term effectiveness of all lime products is based on their effective calcium carbonate which is determined from the purity and the fineness of the product. Therefore, 100 lbs of 60% effective ag lime (60% ECC) is as effective as 67 lbs of 90% ECC pelleted lime, although the pelleted lime is expected to adjust pH more quickly than ag-lime. Typically, large amounts of ag lime are applied infrequently while small amounts of pelleted lime are applied every year or every other year to maintain soil pH. *(See page 18 for story comparing the economics of each type.)*

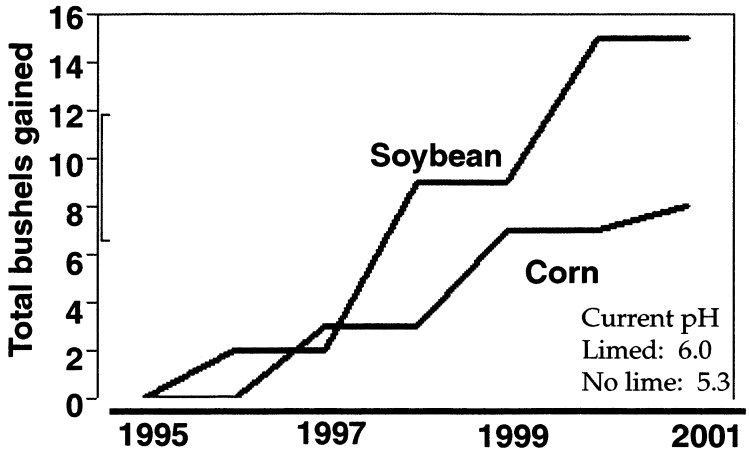


Figure 1. Cumulative lime effect on corn and soybean yield with annual tillage in Washington County (1995-2001). The pH at liming was 5.5. Liming cost was $44 per acre. (From on-farm cooperative research in Washington County with farmer Rusty Hilgenkamp and NU Extension educator Jim Peterson.)

Table 1. Soil pH for no-till soils at four depths two, three, or four years after application.

Years since appl.	*Sample depth (in inches)* 0-1	1-2	2-4	4-8
4	6.6	6.0	5.3	5.2
3	6.3	5.4	5.2	5.4
2	6.5	5.7	5.3	5.4

Current recommendations of the University of Nebraska are to apply enough lime to restore soil pH to 6.5 if the lime is well incorporated to a depth of 6 to 7 inches. This pH is well above the threshold level for the corn-soybean rotation. A more profitable approach may be to apply less lime more frequently. For example, to maintain soil pH above the threshold over a 20-year period, the cost per $100 invested at 8% interest would be $466 if all of the lime is applied in the first year; however the cost would be just $340 if 50% of the lime were applied in the first year and 50% were applied in the ninth year.

Lime materials need to be well mixed with the soil for quick adjustment of pH; however lime applied to no-till acres generally is not incorporated. It appears that the effect of non-incorporated lime moves downward at less than ½ inch per year on fine-textured soils of eastern Nebraska (*Table 1*). For no-till, soil amendment with lime that is not incorporated is likely to be less costly and equally effective if the recommended amount of lime is applied in three applications over a 10- to 12-year period as compared to applying the full amount in the first year.

Charles Wortmann, Extension Nutrient Management Specialist