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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2002-3
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Minimize tillage to protect soil structure

With conditions as dry as they are this spring, producers must analyze each and every tillage operation. Unnecessary tillage destroys soil structure, causes compaction, oxidizes organic materials, dries the soil, increases the potential for erosion, and wastes money. Tillage costs include far more than just the dollars for fuel, labor, and equipment when you consider what happens to the soil.

Tillage destroys residue, exposing the soil to the forces of erosion. The same raindrop impact that causes erosion can cause soil crusting when residue is not there to absorb the energy of the falling drop. This crust reduces infiltration and increases runoff, making the rainfall or irrigation less effective. The same residue acts as a mulch to reduce evaporation from the soil surface, further conserving soil moisture. Producers should adjust and operate machinery to keep as much residue on the soil surface as possible.

Tillage drys the soil, often 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 soil moisture loss of up to 1 inch of water. Shallower tillage, even row crop cultivation, can still result in moisture losses of about 1/2 inch. By not tilling or cultivating, these moisture losses can be minimized and the residue can be retained. A moist soil with residue cover doesn't get as hot as a bare soil, allowing better root development during dry conditions.

Tillage destroys soil structure by

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Inside

Precipitation deficits increase despite recent snowstorms

Two storm systems moved across the state during the last two weeks bringing locally heavy snow to portions of northern and southern Nebraska. Although the moisture was welcome, it fell short of alleviating critical dryness over the western half of the state.

The first system impacted the northern half of the Panhandle and western portions of the Sandhill region March 15-17. Snowfall totals averaged close to 12 inches across this region, with up to 22 inches reported in the northwestern corner of the Panhandle. The second system moved across southwestern, south central, and southeastern Nebraska March 23-25. Moderate snow was reported throughout this region, with the heaviest totals reported across southeastern Nebraska.

Even with these two systems, precipitation departures from normal since January continue to increase. Most areas of the state are reporting 40-90% of normal precipitation during the last 90 days. During April, weekly precipitation should average 0.50 inches across western Nebraska, while eastern Nebraska should average 0.75 inches. The latest storm that moved across southern Nebraska produced 0.25 to 0.90 inches of water-equivalent precipitation. In essence, only a week's worth of precipitation fell with this event.

It appears that a vast area encompassing the southern half of the Panhandle, the southern half of the Sandhills, southwestern, central, and south central areas of the state

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Updates

Management tips
April 1-8

♦ Watch wheat and alfalfa closely for army cutworm feeding as the weather warms up and crops start growing. Heavy feeding has been reported in Kansas wheat the past several weeks.

♦ Check your owner's manual and perform the recommended preseason lubrication and service on your tractors.

♦ Calibrate your manure spreader by spreading three 22-square foot sheets of plastic on the ground, then drive over and on each side of them. The average number of pounds of manure per 22 square feet. equals the tons per acre. Note your gear, rpm, and apron speed for future reference. (22 sq. ft. = 4 feet x 5.5 feet , or approximately 3 feet x 7 feet 3 inches, or approximately 5 feet x 4.4 feet.)

Hot off the Press

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*

Care of Newly Planted Trees, G1195

Site Preparation: Key to Successful Conservation, G1417.

Note:

In the March 15 issue of *CropWatch*, the story, "Using lime to amend acid soils" features results of on-farm cooperative research conducted as part of the Nebraska Soybean and Feed Grains Profitability Project. For more information about the project, see the boxed story on page 30.

Web sites

Sometimes landowners have a choice: rent land to an established producer or rent to a beginning farmer facing extraordinary start-up expenses. A new state plan aims to even out the risk for landlords by offering a tax break which may benefit beginning farmers. Roy Frederick, NU ag policy specialist, discusses the plan on *Market Journal* at *http://marketjournal.unl.edu.*

Market Journal also features:

• *Tell-all Web Site Prompts Federal Action* – Now everybody knows just how much everybody else is getting in subsidy payments and the controversy has Congress looking more closely at how federal farm dollars are distributed. Some say the numbers show wealthy farms getting richer. Others take a different view. See *Market Journal* for a report.

• Self-Employment/Social Security Tax – Part 4 of a *Market Journal* series on spring tax planning for ag producers addresses why you shouldn't reduce the amount you pay in Social Security tax; with Gary Bredensteiner, Nebraska Farm Business Association director.

For National Ag Week the Nebraska Department of Agriculture posted a commentary from Director Merlyn Carlson as well as information on the importance of agriculture in Nebraska, a children's ag activity page, ag production comparisons and more. The site is at *http://www.agr.state.ne.us/photos/02agweek/02agweek.htm.*

Ag facts

Production agriculture contributes more than $9 billion to Nebraska's economy each year.

Nebraska has 54,000 farms and ranches; the average operation consists of 859 acres and average net income per farm ranged from $40,000 to $60,000 during the last four years.

CROP WATCH

cropwatch.unl.edu

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Minimal tillage *(Continued from page 21)*

breaking up the existing structure and pulverizing the soil surface, making the soil prone to crusting. This loosened soil is easily packed down on the next pass through the field, often packing the soil tighter than it was before the initial tillage. Tillage pans are formed below the tillage depth where the weight of the implement is being carried. Care must be taken especially on wet soils as these are the ones most easily compacted. Tillage to "dry out" soil actually makes wet spots in fields wetter because water cannot drain away naturally when the tillage pan forms. When it does turn dry, this compaction restricts root growth and the crop roots cannot reach moisture stored in the soil below that compacted layer.

Tillage mixes air into the soil profile, oxidizing crop residues and organic matter. This adds to CO_2 in the atmosphere and reduces the amount of carbon stored in the soil. With less organic matter, water and nutrient storage is much less. Also, organic matter acts like the "glue" that holds soil particles together and builds soil structure.

By parking the tillage tools, continuous no-till allows mother nature to build soil and soil structure. After about 15 to 20 freeze-thaw cycles and/or wetting-drying cycles, vertical soil structure builds up enough to heal the soil from tillage. At the tillage depth, there are only about three to five cycles per year. This is why many no-tillers talk about something happening to the soil after about five years of no-till. They finally accumulated the 15 to 20 cycles needed to build soil structure, improving root and water penetration into the soil.

Tilling every other year, or even once in a while, erases those cycles and soil structure cannot build. To get the full benefits of no-till, every crop in the rotation needs to be no-tilled. With Nebraska's soils, long-term no-till, properly managed, will improve the soil and provide great returns.

Paul Jasa
Extension Engineer

Precipitation *(Continued from page 21)*

continue to deteriorate from the lack of above normal precipitation. Much of the surplus precipitation that fell from the end of the 2001 growing season through the end of November has been eliminated. Attention is now focused on whether precipitation deficits will continue as we enter the critical spring recharge period.

Long lead outlooks don't offer much promise. They indicate that during April all of Nebraska should experience drier than normal conditions, with the eastern two-thirds of the state having the greatest likelihood of receiving below normal moisture. If this forecast proves true, I expect that much of the state will be classified as experiencing moderate to severe drought conditions.

Snow pack data that was released at drought meetings in Colorado and Wyoming in early March doesn't offer much hope for inflow rates into the Platte River system. As of March 1, snow pack in the Platte River basins of northeast Colorado and southwest Wyoming were running at 56% of the historical average. The Natural Resource and Conservation Service indicated that it would take 276% of normal snowfall through the middle of April just to bring the snow pack back to historical norms.

Taking advantage of weather info and adjusting agriculture to weather models.

See stories on pages 26 & 27

Snowpack feeding the southern branch of the Platte River stood at less than 50% of historical average on March 1, while snowpacks were running between 50% and 70% of normal for basins feeding the north branch. In addition, the Republican river was running at less that 10% of historical flows from the Colorado border east to the Harlan County reservoir.

Colorado and Wyoming snowpacks typically reach their peak depth by April 15. With only a couple of weeks left, it is apparent that the snowmelt will be significantly below normal this spring. On March 1, flow rates on both branches of the Platte River entering Nebraska were projected to be less than 70% of the historical average this spring and summer. This forecast was based on the assumption that normal precipitation would fall through May 1.

Short-term forecasts give no indication that another major storm is on tap for the Central Plains during the next 10 days. In fact, only a couple of minor disturbances are projected to move across the region and they will contain limited moisture. Temperatures should begin to increase through next week as a rather strong ridge begins to build over the south central United States. Conditions should be very good for producers to begin field preparation activities.

Al Dutcher, State Climatologist
School of Natural Resources

Controlling downy brome in pastures

Thousands of acres of pastures and rangeland are infested with downy brome. Annual bromes (downy brome, hairy chess, and Japanese brome) have little grazing value after seed heads are formed and may reduce livestock performance. The drought in 2000 and 2001 has aided the increase of the winter annual bromes and hindered the growth of perennial grasses. Control of downy brome in pastures and rangeland requires a combination of herbicides and grazing management.

Atrazine, glyphosate, paraquat, and combinations with atrazine are the most economical means of controlling downy brome in perennial grasses; however, registration restrictions limit their use. Not all atrazine or glyphosate labels mention control of downy brome in pastures and rangeland. *Check labels before using.*

The Shotgun® label (EPA Reg. No. 34704-728) (atrazine + 2,4-D) allows its use to renovate existing grass pasture stands. The present label only allows such applications to grassland *not in agricultural production* (such as CRP) or to renovate existing stands. As of October 2001 grazing or hay removal can begin after two growing seasons have passed after application of Shotgun, according to the EPA. This is the only label that will allow this application. Suggested rate for Shotgun is 1 to 2 quarts per acre on soils with 1% to 2% organic matter and up to 3 quarts per acre on soils containing more than 2% organic matter. A quart of Shotgun contains 0.56 pounds of atrazine and 0.25 pounds of 2,4-D per acre.

Atrazine at 0.5 to 1 quart per acre will control downy brome in pastures and rangeland. On coarser-textured soils the maximum rate for atrazine should be reduced to 0.8 quart per acre to avoid injury to desirable grasses. Atrazine at 0.5 quart per acre applied in the fall may not control downy brome that germinates in the spring. In the spring add atrazine to glyphosate or paraquat to control late emerging downy brome. Big bluestem, bluegrama, buffalograss, indiangrass, little bluestem, sideoats grama, and needle-and-thread are more tolerant to atrazine than crested wheatgrass, smooth brome, switchgrass, and western wheatgrass.

Some glyphosate products are labeled for controlling downy brome in dormant pastures and rangeland. These include Glymix MT®, Glyphomax®, Roundup Original Glyphosate®, and Roundup Ultra®. Other glyphosate products have registrations on pasture grasses that are not adapted to Nebraska such as bahiagrass and bermudagrass. Domestic livestock must be removed before application, and pastures cannot be grazed or harvested for hay for eight weeks after treatments.

Suggested rate for controlling downy brome and many other annual weeds growing with perennial cool and/or warm season grasses with glyphosate is 12 to 16 ounces per acre. Some labels, for instance Gly Star®, may suggest 8 to 16 ounces per acre. Fall applications should be made when good fall growth is present after a hard freeze has killed the top-growth of perennial grasses. Spring applications must be made before perennial grass growth begins in the spring. Applying glyphosate to perennial grasses before a killing frost or after plants green up in the spring will cause injury.

AMS or ammonium sulfate should not be used with glyphosate when treating pastures or rangeland. Apparently, the ammonium sulfate increases injury to the perennial grasses.

Paraquat at 16 ounces per acre will control downy brome in the fall, but will not kill downy brome in the spring if it is well tillered because regrowth occurs from tillers. Paraquat may severely injure some perennial grasses, such as Kentucky bluegrass.

Gail A. Wicks
Extension Weeds Specialist
West Central REC
Robert G. Wilson
Extension Weeds Specialist
Panhandle REC

Grazing offers weed control alternative

One method for controlling early weeds in warm-season grasses is to graze them. Heavy, preseason grazing costs little and may eliminate the need to feed expensive hay.

Preseason grazing will not harm summer grass — provided you finish grazing before new grass shoots get more than a couple inches tall. This usually doesn't occur until late April or early May in southern Nebraska and slightly later further north.

Early, preseason grazing of warm-season grass also removes some old growth from last year which starts recycling nutrients trapped in dead plant tissue. In fact, about the only bad news about early, preseason grazing is you have to get fences and water ready earlier, you need to move animals to the pasture, and you won't completely kill out these weeds in one year.

Bruce Anderson
Extension Forage Specialist

Controlling winter annuals in no-till corn

Many producers in southeast Nebraska and other parts of the state are starting to notice scattered purple blankets in their no-till fields. Henbit has become more prevalent and by the time you notice this purple flowering weed, it is too late to do anything. In addition to henbit, other winter annual weeds such as horseweed (marestail), pennycress, shepherdspurse, and tansy mustard are showing up more regularly in no-till corn fields.

Why have these weeds become a problem and what do we do about them?

First, we need to talk a little about biology. Since these weeds are annuals they have one year to germinate, grow vegetatively and set seed. Basically it is the annual's job to produce seed so that the species will continue the next year; everything else is secondary. The life cycle of these winter annual weeds differs from summer annuals like foxtail and velvet leaf which typically germinate and produce seed within the growing season. These winter annual weeds actually germinate in the fall and begin growing before winter. In spring. they usually bolt and produce seed before corn or beans are planted.

Why should you worry about controlling winter annuals? Many southeast Nebraska producers have found that no-till fields are excellent at conserving moisture in dry-land situations. Unfortunately winter annuals will use valuable moisture that could be available to the crop.

Many people wonder why have these winter annual weeds have become such a problem lately. One speculation is that winter annual weeds are popping up in no-till corn fields where the increased use of Roundup-Ready soybeans means there is little or no herbicide residual to control these weeds. When conventional soybean were the norm, traditional herbicides provided residual control to keep many of the winter annuals from germinating or growing in the fall.

What are the best herbicides for control of winter annuals. Well the biggest issue is timing. Most of the herbicides work best before the weeds have bolted. This typically requires monitoring fields early and spraying as soon as temperatures warm up enough for plant growth. Below are several products that will provide control of henbit and will provide similar or better control of horseweed (marestail), pennycress, and other winter annuals.

Treatment	% Henbit control
2,4-D ester 1 pt	65
2,4-D ester + Banvel 1pt + ½pt	83
Atrazine + COC 2qt	100
Gramoxone 1.5 pt	93
Roundup Ultra 1pt	83
Roundup Ultra 1.5pt	93
Roundup Ultra + 2,4-D 1pt + 1pt	93

In addition the University of Missouri has done some work with fall-applied herbicides and their control of henbit.

Treatment	% Control in spring
Canopy 3oz + 2,4-D	100
Canopy XL 4oz + 2,4-D	98
Sencor 6 oz	94

The fall treatments should provide good control but may not eliminate the need for a spring burndown.

Brady Kappler
Weed Science Educator

New herbicides, label changes

Aim (FMC) has been reformulated into a 2lb emulsifiable water-based formulation. The new use rate is 0.5 oz in corn. In addition the label now includes control of waterhemp less than 3 inches tall.

Beyond (BASF), which has the same active ingredient as Raptor, is now labeled in Clearfield (Imi) wheat.

Guardsman Max (BASF) is a relatively new pre-emergent herbicide for corn. It replaces Guardsman by using Outlook premixed with atrazine instead of Frontier.

Plateau (BASF) now has a full label in rangeland and pasture.

Raptor (BASF) is now labeled for alfalfa and dry beans.

Valor (Valent) is a new preemergence and pre-plant burn-down compound from Valent for small-seeded broadleaf control in soybeans without significant rotational concerns.

Yukon (Monsanto) is a premix of 2/3 ounce of Permit and 4 ounces of Dicamba for use in corn.

Brady Kappler
Weed Science Educator

Coming soon in CropWatch

The April 5 edition of *CropWatch* will feature stories related to corn production and the April 12 edition will feature stories related to soybean production in addition to other topics.

NU research examines impact of future climate changes on wheat production

While none of us has a crystal ball, research-based projections of future climate conditions can help crop breeders consider changes that may be necessary for future cultivars. The future discussed in this article will be projections of the climate for the last 30 years of this century (2071-2100) and its impact on winter wheat at two locations with contrasting climates in Nebraska: Alliance in the Panhandle and the NU Havelock Farm in northeast Lincoln. Studying crop responses so far in the future also is important to policy makers as they plan for the future.

Two contrasting models of global climate change were used to study winter wheat responses. Both of these models indicate increased temperatures compared to current temperatures; the more optimistic model indicates less of a temperature increase than the pessimistic model. The optimistic model also indicates increased precipitation in southeast Nebraska compared to current precipitation. In the Panhandle both models project less precipitation in the coming years while the optimistic model projects less of a decrease.

A current state of the art wheat model was used to simulate wheat yields and grain protein content. Responses from two contrasting winter wheat cultivars were studied, one adapted to Nebraska conditions and one adapted for warmer conditions as found in Kansas. The choice of the latter cultivar was based on the premise that cultivars currently grown in warmer climates might be immediately adaptable to projected future conditions in Nebraska.

Two sowing dates were used in this study. One sowing date represented the current sowing date while the other sowing date represented the day when the average air temperature from the climate change models was the same as the current average sowing date temperatures.

Alliance results

For Alliance, yields from the first sowing date for both cultivars using the pessimistic climate change model projections were less than the simulated yields using the current weather data. For the second sowing date using the pessimistic climate change model projections, yields were almost equal to yields simulated with current weather data. Using the optimistic projections, on the first sowing date for both cultivars, simulated yields almost equaled simulated yields using the current weather data. On the second sowing date, simulated yields using these optimistic projections exceeded the yields using the current weather data. However, the variability associated with all the yields was very high, much higher than the simulated yields using the current weather data. Simulated protein concentrations for the first sowing dates for both cultivars was about the same as with the current weather data, while simulated protein concentrations were much lower for the second sowing date for both cultivars and both climate change model projections.

Lincoln results

In contrast, at Lincoln, yields for both sowing dates, both cultivars, and using both climate change projections indicated increased yields over the simulated yields using the current weather data. Variability associated with simulated yields was lower than yields simulated with current weather data. Simulated protein concentrations for the first sowing date for both cultivars using both climate change model projections were about equal to concentrations simulated with current weather data. For the second sowing date, protein concentrations decreased for both cultivars and both climate change projections.

Summary

The models indicate that some regions of the state will become less favorable and some more favorable for winter wheat production. The simple adaptation (a cultivar adapted to a warmer climate and later seeding date) for the climate change projections we used cannot totally compensate for both losses of yield and protein content. If the current grain protein levels and yields are to be maintained in future cultivars, these future cultivars will have to become more efficient in taking up nitrogen from the soil and repartitioning it to the grain. The future will present us with both opportunities and challenges.

Albert Weiss, Professor
Cynthia J. Hayes, Research Technologist
Both in the NU School of Natural Resource Sciences

Pesticide waste collection sites

Eight dates are left for you to safely dispose of unusable or unwanted pesticide products. The waste pesticide collection program is sponsored by the Nebraska Department of Agriculture (NDA), the Nebraska Department of Environmental Quality, the Nebraska Agri- Business Association, and the University of Nebraska Cooperative Extension.

While some of the collection dates have passed, eight remain. At each site, pesticides are accepted at no cost and with no questions asked. Individuals having over 1000 pounds of product are asked to provide a nominal fee for every

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Producer input invited

Help develop weather/climate tools that match your needs and farming strategies

While producers may not be able to control the weather and climate, understanding and using the latest information and climate assessment technologies can help them better plan for and take advantage of it.

Historically, there have been many obstacles to using climate information and weather forecasts, primarily concerns about its accuracy. The good news is that in recent years serious effort has been put into improving the accuracy and reliability of weather and climate forecasts. Now, seasonal forecasts have an average success rate of about 60%, with the rate for daily and weekly forecasts being even higher. In 1997 the first forecast of El Nino was successful. It was widely used and benefitted agricultural producers and resource managers across the nation in many significant ways.

In order to feel more confident using these forecasts in agriculture, we have to overcome another obstacle, that is, how to respond to individual failed forecasts and not be overwhelmed by their negative impact. Like climate and weather forecasts, almost every technology or procedure in agricultural production has some uncertainties. For instance, a seed germination rate may be 90% or even just 80%. Similarly, a pesticide may only kill a percentage of its intended targets. After years of use, we have accepted the potential for such uncertainties and have developed ways to make up the shortfalls. These uncertainties are comparable to those faced when using seasonal or weekly forecasts, but because forecasts may be relatively new tools in our operations, we have little knowledge of how to deal with problems.

Producers already are applying some methods for using seasonal forecasts while minimizing the potential impacts of forecast inaccuracy. These methods have included planting a mix of hybrid seeds with both high and low water usage and yield, and diversifying farm operations to include either forage production or farm animals. For short-term forecasts problems, we can adjust a strategy or repeat an operation. For example, when a predicted rain does not occur, irrigation can be implemented. Allowing for the predicted rain provides a chance to take advantage of the weather and potentially reduce irrigation costs.

What: Climate Education and Extension Project
When: 8-4:30 April 19
Where: UNK Campus
Why: To learn about climate/weather data for ag management and the potential for developing new products

Routinely applying climate and weather forecasts as well as strategies to manage related risks can help producers maintain steady productivity in a changing environment. Moreover, because it takes no more work or investment to apply the forecasts than to not use them, the rewards and benefits are obvious.

To develop forecast and information products tied to the needs and uses of producers, the Climate Education and Extension Project (CEEP) was created. It will work with extension personnel and agricultural producers to provide weather and climate forecasts on a variety of time scales and climate products useful for Nebraska. It also will be developing farming strategies that take advantage of seasonal and short-term forecasts with a goal of improving ag profits.

Producers, Extension faculty and agribusiness are invited to attend the first CEEP workshop on April 19 at the University of Nebraska Campus at Kearney to learn more about the project and to talk with faculty about the kind of weather and climate tools they would use. This workshop will introduce major resources of weather and climate forecasts and information products and include illustrations of how Nebraska producers are currently using these resources in their operations.

The workshop is free and will be held from 8 a.m. to 4:30 p.m. and include the following topics: Climate Forecasts and their Interpretations; the Nebraska Weather Monitoring Network (AWDN) and its Products; Applying Weather Data in Irrigation Scheduling; Using Weather/Climate Data to Manage Alfalfa; Strategies for Reducing Adverse Weather Impacts on Ag Production; Integrating Climate Information in Agricultural Resource Management and Planning; and El Nino in 2002 – an Outlook of its Effect on Nebraska's Spring and Summer Rainfall.

The workshop is free, but registrations are required by April 4. For more information about the workshop or to register, visit the CEEP Web site at *http://snrs.unl.edu/climate/CEEP_2.pdf*, contact Steve Hu at 402-472-6642, or e-mail him at: qhu2@unl.edu.

Current UNL faculty on the CEEP Committee, including several of our *Crop Watch* contributors, are Hu, Kenneth Hubbard, William Waltman, Roger Selley, James Stack, Andrew Christiansen, Keith Glewen, William Kranz, Gary Hein, and Dean Yonts.

Steve Hu, Climatologist, School of Natural Resource Sciences

NU survey shows ag land values up

Nebraska's agricultural real estate market is strong despite below-normal aggregate net farm income and lackluster crop prices, according to the University of Nebraska's 2002 Nebraska Farm Real Estate Market Survey.

Land values and cash rental rates are, with few exceptions, at or above last year's levels, said Bruce Johnson, the NU agricultural economist who conducted the survey.

"Preliminary agricultural land values are up more than 4% overall, with some areas of the state even stronger," Johnson said. "Survey reporters were almost universal in their observations that no land value declines have been evident, but rather the market has been one of stable to upward moving values."

As of Feb. 1, the preliminary statewide all-land average value was $738 per acre, up 4.1% from last year's average of $709. That follows two years of relative stability, with statewide increases of 1.6% recorded last year and less than 1% the year before.

"Very limited amounts of land offered for sale with strong demand from expansion farmer buyers and non-farmer investors seem to be the major factors in the value increase," Johnson said. "Indirectly, the large dollar infusions of government price support programs over the past few years as well as 1031 tax exchange provisions also are contributing."

Geographically, northeast Nebraska saw the biggest value changes for the year, with the preliminary all-land average up more than 8% to $1,202 per acre. Dryland cropland value in that region increased by 11%.

"This region has experienced some above-average crop seasons recently, as well as gaining additional dollar returns for increased soybean production," the Institute of Agriculture and Natural Resources specialist said. "These factors, coupled with the area's integrated crop and livestock economy, have led to somewhat higher percentage rates of return to land in the northeast relative to the rest of the state. In turn, land values have had a stronger base."

The northwest region saw all-land value increases of 3.6% from last year, to $284 per acre. All-land values in the north, including much of the state's rangeland, increased 1.9% to $318 per acre. Despite moisture deficits for most of the year, all-land values in southwest

Nebraska rose to $496 per acre, an increase of 5.3% over last year. In the central region, all-land values increased 5.9% to $904 per acre. In the south and southeast, all-land values are $1,082 and $1,214 per acre, increases of 2.1% and 6.2% respectively. The smallest increase over last year, 0.7%, was recorded in the east, with an average all-land value of $1,760.

Preliminary cash rental rates across Nebraska in all measurable categories are at or above last year's rates, according to the survey.

"In many cases, the 2002 cash rent levels are at historic highs for those land classes and areas," Johnson said. "Even though farm program payments will be downsized further in 2002, the demand for crop land to cash rent is strong in most local markets, thus keeping cash rental rates on a stable-to-upward pattern."

Preliminary pasture rental rates for 2002 also are higher across all areas of the state, in some cases by more than 5%. This increase likely is a result of a fairly profitable cattle economy and high demand for forage in the past few years, Johnson said.

Nearly 96% of Nebraska's 49.5 million acres is agricultural land, split almost evenly between cropland and range or pasture. Reports from 250 agricultural land market experts were compiled for this survey, which is conducted in cooperation with IANR's Agricultural Research Division.

Heather Corley
IANR News and Publishing

Pesticide collection sites *(Continued from page 26)*

pound over this amount to cover disposal costs. If you plan to turn-in quantities of 1,000 pounds or more. Leave labels on pesticide containers and handle containers to avoid spills.

Pesticide products in pressurized cylinders, oil, antifreeze, tires, paints, varnishes, thinners, cleaners and solvents will not be accepted.

Collection sites

Pesticides will be accepted at the following sites from 8 a.m. to noon:

March 30, Kearney, Kearney Recycling Center, 1919 15th Ave.

April 15, Norfolk, Madison County Weed Control, 3203 South 12th St.

April 16, O'Neill, Central Farmers Co-op, 415 East Hwy 20

April 17, Ainsworth, Ainsworth Transfer Station, PO Box 165, RR2

April 18, Chadron, Swann Transfer Station, 1010 E. Niobrara Ave.

April 19, Alliance, West Co,724 W 3rd St., Box H

April 22, Scottsbluff, UAP, 3010 Immigrant Trail Drive

April 23, Sidney, Far Mor Co-op, 1433 Illinois St.

Estimating manure's worth for your operation

Livestock feeders often need land for manure application to avoid excessive buildup of soil phosphorus. In some cases, they request payment to reduce transport costs. Producers need to estimate the value of the manure to decide when it's a good buy for their operation.

Manure supplies all of the nutrients needed by crops and often helps improve soil biological and physical properties such as the rate of water infiltration. Because of these soil improvements, crop yield is often more with manure application than with fertilizers.

One way to estimate the value of manure is to use results from on-farm trials to determine the value of the fertilizer replaced and any increase in productivity. Several trials have been conducted by farmers participating in the Nebraska Soybean and Feed Grains Profitability Project in eastern Nebraska. (*See page 30.*)

In one trial conducted by Ron Larsen of Wahoo over three years, 25 tons of beef slurry (10% dry matter) was applied. The manure replaced $42.23 of fertilizer, resulted in $22.50 of added corn production, and supplied additional nutrients valued at $64.02 for a total value of $128.85 or about $5.15 per ton. Consultant assisting with the trial was Tom Vrbka of Wahoo.

The results were similar in a second trial, which was conducted by Dale Hanson and sons of Mead. During the first year of the three-year trial, 27 tons of beef slurry replaced $38.41 of fertilizer, resulted in $10 additional corn production, and supplied additional nutrients valued at $69.14 for a total value of $108 or $4 per ton. Vrbka also assisted with this trial.

Richard DeLoughery, Extension Water Quality Education Coordinator, calculated nutrient values of common manures and found: "For example, one ton of beef feedlot manure can contain over $6 of nitrogen and phosphorus (using current fertilizer prices), plus value from the organic matter and other nutrients. If it is applied at 25 tons an acre, that is over $150 per acre of fertilizer value. Slurry swine manure from a pit under a confinement building will have nitrogen and phosphorus worth about $7 per 1000 gallons. If applied at 5,000 gallons an acre, it would be worth about $35 per acre."

If your soil is already high in nutrients and has a sufficient infiltration rate that water loss to runoff is not a problem, there may be little short-term benefit to manure. Manure is much more valuable when there is a need to build levels of phosphorus and other nutrients. The value of phosphorus alone in manure typically ranges from $1.90/ton for feedlot manure to $14.70 for broiler litter. Additional value can be gained when there is a need to improve the water infiltration rate as well as the nutrient supply. To maximize profit, manure generally should be applied where soil phosphorus is low or very low, and a cereal such as corn is to be planted.

When calculating the value of manure, you should also consider potential problems with its use.

- The nutrient content of manure is not uniform and the rate of nutrient application may vary across the field. Rates of slurry application may differ as well, often with lower rates as the tank approaches empty. Nitrogen may need to be monitored during the season after the first manure application to determine if in-season nitrogen may be needed. Manure continues to supply nitrogen for several years and subsequent manure applications tend to even out the nitrogen supply.
- Solid feedlot manure may be unevenly applied, for example in large frozen lumps that later may cause planter skips.
- Manure from feedlots may contain debris, such as pieces of concrete pads.
- Weed seed may be inadvertently included.

Crop producers generally find that the benefits of manure outweigh the problems when it is applied to responsive fields.

Charles Wortmann, Extension Nutrient Management Specialist

Check alfalfa condition early

Alfalfa usually comes through winter in pretty good condition; however, this year some fields went into winter in weakened shape because of the dry summer. In addition, this winter was so mild that plants may have bounced between winter dormancy and greening up all season.

Evaluate stands early this spring. Older, dryland fields need 40 new shoots per square foot coming from two or three plants for maximum yields. If fewer than 30 shoots are present, new fields may need to be planted. Very productive sites, such as irrigated and sub-irrigated fields, should have at least 55 shoots per square foot from four to six plants. Consider new plantings if these fields have fewer than 40 shoots. We tend to lose about one tenth of a ton in yield potential for every shoot below these numbers.

Check for these densities in several areas when shoots are 6 inches tall. Since some shoots begin growing later than others, stands with enough plants but slightly low shoot density may be all right, especially if shoot height and distribution is uniform.

Bruce Anderson
Extension Forage Specialist

Valuing biosolids from municipal waste water

Municipalities often have biosolids produced from sewage sludge available for land application. In some cases, they ask crop producers to pay for the product. How can producers estimate the value of these biosolids?

Biosolids supply the full complement of nutrients needed by crops, and often help to improve soil biological and physical properties such as the rate of water infiltration. Because of these improvements, crop yield is often more with biosolid application than with fertilizers.

One way to estimate its value is to use results from trials to determine the value of the fertilizer replaced and the increase in productivity. Several trials have been conducted by farmers participating in the Nebraska Soybean and Feed Grains Profitability Project in eastern Nebraska. (For more information, visit their web site at *http://on-farmresearch.unl.edu*).

In a biosolids trial conducted over four years by Dave and Wayne Nielsen of Lincoln, 45 tons of biosolids were applied. The biosolid replaced $19.42 of fertilizer. It increased yield as compared to fertilizer alone by a total of 17 bu/A corn @ $2.50, 35 bu/A sorghum @ $2.25, and 1 bu/A soybean @ $4.50 for total value of $126 in increased production. The total value can be estimated at $145.42 or $3.22 per ton. Assisting with the trial were Earle Raun, consultant, Keith Glewen, extension educator, and Dave Varner, extension educator.

In a second trial conducted by Burdette Piening of Lincoln over three years, 35 tons of biosolids were applied. The biosolid replaced $15.21 worth of fertilizer. It increased yield as compared to fertilizer alone by a total of 15 bu/A corn for total value of $37.50 in increased production. The total value can be estimated at $52.71 or $1.50 per ton. Ag consultant assisting with the trial was Charlie Hartwell.

In a third trial, which was conducted by Lynn Vinduska of Plattsmouth for three years, 25 cubic yards were applied. The biosolids replaced $34.83 in fertilizer and the total increase in corn and soybean yield as compared to fertilizer alone was $224.83. This gives a value of $10.39 per ton. Ed Penas of Lincoln consulted on the trial.

If your soil is already high in nutrients and has a sufficient infiltration rate, the benefits may not be fully realized in the short term. Greater crop response to applied biosolids can be expected if: 1) soil test phosphorus is low; 2) one or more micro-nutrients are deficient; and/or 3) water infiltration is slow and runoff is high due to low organic matter and/or high clay content in the surface soil.

Biosolids are well-regulated under EPA Rule 503 to ensure their safety for land application. Biosolids for land application must pass standards for pathogen levels, concentrations of polluting metals, and for attracting flies, rodents and other disease carriers. The potential for environmental contamination is less if:

1) soil test phosphorus is low;

2) there is little or no chance of flooding;

3) the depth to a drinking water aquifer is more than 6.5 feet and the soil has fine texture;

4) best management practices for erosion and runoff control are applied when slope is more than 6%, and biosolids are not applied when slope is more than 12%;

5) water holding capacity is greater than 1 inch per foot of soil depth;

6) biosolids are not applied to wetlands; and/or

7) the application site is more than 100 feet from open water bodies or water flow channels.

Charles Wortmann, Extension Nutrient Management Specialist

Farmers/consultants/NU groups join for on-farm trials, marketing

Several *CropWatch* stories this week and in the coming weeks feature results, information and recommended practices based on research conducted as part of the Nebraska Soybean and Feed Grains Profitability Project. This is a cooperative educational on-farm research/commodity marketing program among Nebraska farmers, private industry representatives and University of Nebraska Cooperative Extension faculty.

The project consists of four components: on-farm research, commodity marketing strategies, farm record analysis and continuing education programs. Visit their Web site at *http://on-farmresearch.unl.edu* to learn more about the project and view the results of their on-farm research.

For further information about the group or this year's projects, contact the following Extension educators: Dave Varner, Dodge County, 402-727-2775; Keith Glewen, Saunders County, 402-624-8030; Jim Peterson, Washington County, 402-426-9455; Bob Meduna, Saunders County, 402-624-8030; or Tom Dorn, Lancaster County, 402-441-7180.