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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

No. 2003-5
April 11, 2003

In western Nebraska dryland corn

Simulations identify appropriate plant populations

In a two-year multiple site field study conducted in western Nebraska in 1999 and 2000, optimum dryland corn population varied from less than 7,000 established plants per acre to more than 23,000 plants per acre, depending largely on available water resources. The objective of this study was to use a modeling approach to investigate corn population recommendations for a wide range of seasonal variation. A corn growth simulation model was coupled with long-term sequences of historical climatic data from western Nebraska to provide probabilistic estimates of dryland yield for a range of corn populations. Simulated populations ranged from 8,0000 to 20,000 established plants per acre.

Simulations had one of three levels of available soil water at planting, either 3.1, 6.3, or 9.4 inches in the top 5 feet of a loam soil, representing one-third, two-thirds, and full soil water profiles, respectively. At Sidney, Nebraska median yields were maximized at 8,000, 12,000, and 16,000 established plants per acre for starting available water levels of 3.1, 6.3, and 9.4 inches, respectively (*Figure 1, page 43*). Gross margins were maximized at 12,000 established plants per acre when starting available water was 6.3 or 9.4 inches, and the expected probability of a financial loss at this

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Inside

Test for residual nitrates; use NU rates

Capturing the value of soil nutrients not used in the 2002 growing season will reduce input costs for 2003. Many producers routinely surface sample their fields, but fewer take deep samples for nitrates. Sometimes producers may want to increase recommended rates of nutrients to reduce risk. There is a cost to this practice. In years when drought threatens and fertilizer is expensive, it is recommended to fertilize at the level that University of Nebraska research has shown to be profitable.

Many surface soil samples are showing elevated nitrate levels this year. The University of Nebraska Cooperative Extension does not recommend adjusting nitrogen rates based on a surface sample for nitrate. A minimum two-foot sample is needed to adjust nitrogen rates. Because nitrates can move with soil water and roots can grow 3-5 feet below the surface, deep soil samples are the only way to estimate soil nitrates. Soil sampling immediately before planting gives the best estimate of soil nitrates since there is less chance of nitrate losses before the crop needs the nitrogen.

Under limited moisture conditions corn will still respond to nitrogen fertilizer additions, what changes is the magnitude of the increase. Economic analysis of nitrogen rate studies has shown that the cost of nitrogen has to increase to more than double normal prices before rates are decreased. This is because nitrogen use is extremely profitable when the proper rate is applied.

Nitrogen use becomes less profitable when the nitrogen applied does not increase yield further. This is the year to take credit for previous crops, soil nitrogen, manure nitrogen and irrigation water nitrogen.

Charles Shapiro
Soil Scientist – Crop Nutrition
Haskell Ag Lab

Calculate the most profitable corn nitrogen rate recommended by the University of Nebraska for your field situation and view results from several years of nitrogen field trials. See the web site: *Managing Nitrogen Efficiently in Nebraska Crop Production* at *http://cropwatch.unl.edu/focusnitrogen.htm*

Updates

Market Journal Extra to explore potential for West Nile Virus in 2003

In 2002, Nebraska had one of the highest West Nile virus infection rates in the nation. Although it is relatively rare for people to contract the disease associated with West Nile, the virus last year killed 8 people and sickened 180 others in 48 Nebraska counties. The virus was more widespread in horses, with about 1100 equine cases reported in Nebraska in 2002. Kathy Anderson, University of Nebraska Cooperative Extension horse specialist, thinks that number is probably low.

"There were a lot more cases out there than were reported," said Anderson. "Probably two to three times more cases."

Approximately one-third of horses infected with the West Nile virus die.

On the April 18 "Market Journal Extra," Anderson will talk about what to expect from the West Nile virus this year. "Market Journal Extra" is a thirty-minute video program produced by the NU Cooperative Extension. Anderson will describe the West Nile virus, talk about its distribution and transmission, and offer information about disease prevention, identification, and treatment.

The April 18 show can be seen on the Dish Network's University House Channel (NAUHS) 9411 at noon CT. It also may be viewed at the following Cooperative Extension offices: Boone, Cass, Holt, Madison, Saunders, Sioux, Valley, Washington, and York. Audio and video clips from the program will be available on the Web at *http://marketjournal.unl.edu.*

Management calendar

- **Drew Lyon, Dryland Cropping Systems Specialist:** Winter wheat is at various stages of development throughout the state, but most wheat plants will enter the joint stage, when the head begins to emerge from the ground and move up the lengthening stem, in April. Growth regulator herbicides such as 2,4-D and dicamba (Clarity or Banvel) should be applied before jointing, or as soon as possible after jointing, to minimize the risk of injury to wheat plants.
- **Lenis Nelson, Crop Variety and Seed Production Specialist:** Make sure your planters are correctly calibrated for the seed size to be planted this year.
- **Keith Jarvi, Extension Integrated Pest Management:** Put out bait stations for wireworm monitoring in the next week and check them the following week. If one or more wireworms per trap are found, there is potential for economic damage from wireworms and an insecticide for wireworm control should be used at planting. For more details about making and using wireworm bait stations see NU NebGuide, G91-1023, *Insects That Attack Seeds and Seedlings of Field Crops.*

Crop report

For the week ending Sunday, April 6, fieldwork was active as producers prepared for spring planting, according to the USDA's Nebraska Agricultural Statistics Service. Moisture, mostly in the form of snow, was received late in the week. This improved topsoil moisture supplies which are now a little better than a year ago. However, subsoil moisture supplies are beginning the crop year 85% short and very short, unchanged from last fall. Planting of oats and sugar beets was underway.

Wheat condition improved slightly and rated 6% very poor, 18% poor, 42% fair, 33% good, and 1% excellent. These ratings are similar to last year.

Oat seedings progressed to 28% complete and compared to 36% last year and an average of 34%.

Sugarbeet planting had begun in the Panhandle and Southwest districts.

This release is based on reports and data from FSA county directors, county extension educators, NOAA, and the High Plains Climate Center. For current and historic reports see: *http://www.nass.usda.gov/ne/cropwthr/cmts_cur.htm*

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Simulations

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population was reduced from about 10% at 6.3 inches to 0 % at 9.4 inches (*Figure 2*). When starting available water was 3.1 inches, average gross margins were less than $6.10 per acre and risk of financial loss exceeded 40%. Median yields were greatest when starting available soil water was 9.4 inches. However, perhaps the greater benefit of additional soil water at planting was a reduced risk of financial loss.

The danger of using just a few years of field research to make grower recommendations is highlighted in *Figure 3*. Work conducted in the 1990s suggested that a population of 16,000 plants per acre was optimal for dryland corn production in the Panhandle, but for the previous two decades, 12,000 plants per acre was always more profitable than 16,000 plants per acre. Crop simulation modeling is capable of highlighting this research bias and allowing for a more thorough understanding of research results, especially in a highly variable climate such as we have in western Nebraska.

This study suggests that dryland corn growers in western Nebraska should use a population of 12,000 established plants per acre as a base recommendation. Adjustments to this base in the range of about ± 4,000 plants per acre may be made in response to available soil water at planting, changes in corn grain and/or seed prices, and average seasonal precipitation relative to Sidney, Nebraska. In order to achieve an established stand of 12,000 plants per acre, growers will need to set their planters to drop about 10-15% more seed, or 13,200 to 13,800 seeds per acre, depending on seed germination rates and soil conditions at planting.

Drew Lyon, Extension Dryland Cropping Systems Specialist
Panhandle REC
Robert Klein, Extension Cropping Systems Specialist
West Central REC

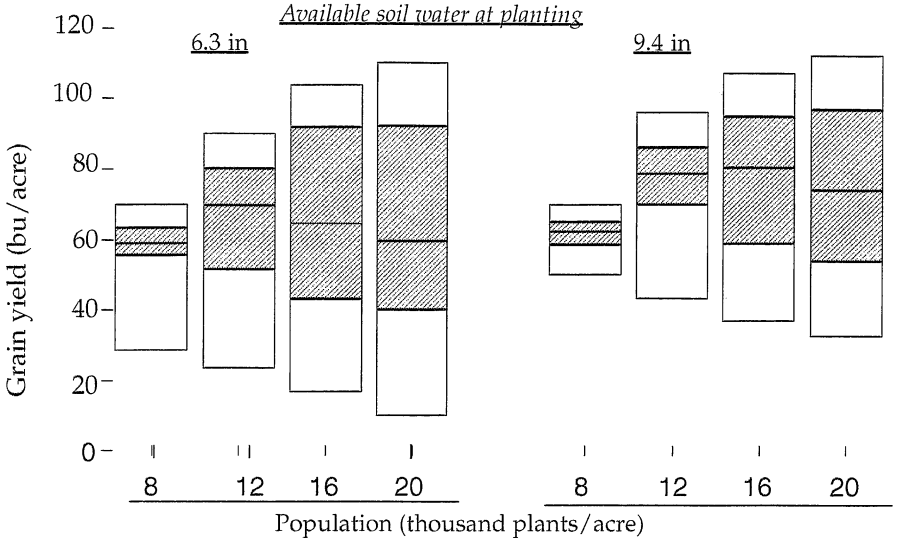

Figure 1. Range of yields for various plant populations and available soil water, Sidney, Nebraska.

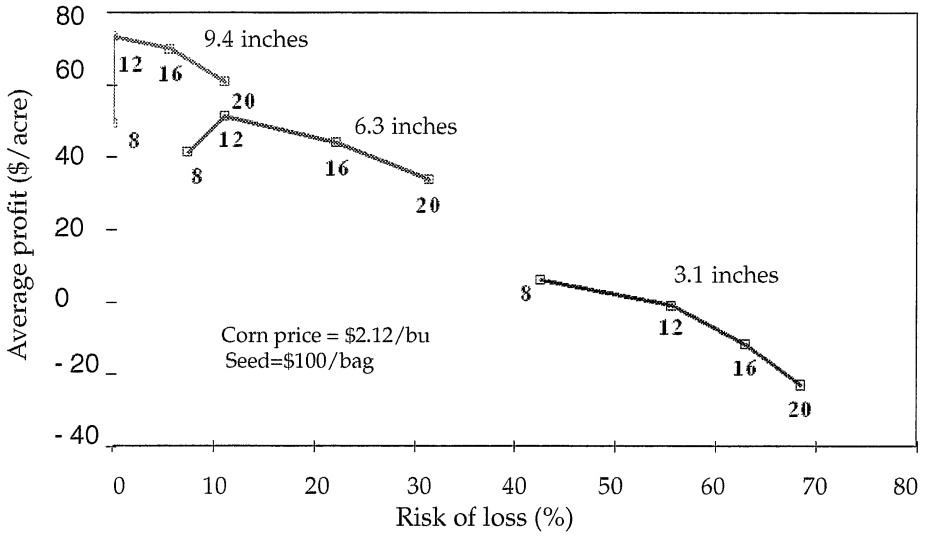

Figure 2. Average profit vs risk of loss, Sidney, Nebraska.

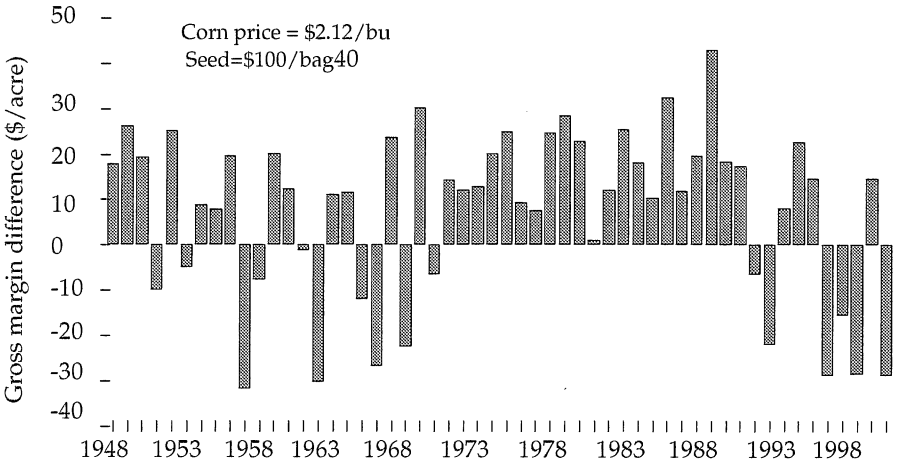

Figure 3. Gross margin difference with 12,000 plants per acre - 16,000 plants per acre.

New herbicides available for 2003

Every year there are new herbicides. Some years we have a lot, some years a few. This year we really don't have any new herbicides with unique modes of action. Instead the products offer repackaging, reformulating and renaming. Here is this year's lineup.

Ally+2,4-D from Dupont is for use in grain sorghum. It now has a Section 3 label. It consists of Ally at 1/20 oz and 2,4-D at 1/4 lb per acre. Do not use a surfactant with it. Apply when the crop is 3-15 inches high. If sorghum is over 10 inches, use drops.

Beyond from BASF contains imazamox. It can only be used postemergence from the third leaf-stage to before jointing on IMI or Clearfield wheat. It controls pennycress, shepherdspurse, tansy mustard, jointed goatgrass and downy brome.

Camix from Syngenta contains mesotrione (Callisto) and s-metolachlor (Duall II Magnum). It can be applied preplant, preemergence or early postemergence in field and seed corn. Its strength is control of black nightshade, lambsquarters, pigweed, sunflower, velvetleaf, waterhemp (including ALS-resistant types), foxtail and crabgrass.

Cimarron from Dupont contains metsulfuron. It is a postemergence herbicide for annual and perennial broadleaf weeds in pastures.

Cimarron Max from Dupont contains metsulfuron plus Dicamba and 2,4-D, which are growth regulators. It is for post application for broad spectrum annual and perennial broadleaf weed control in pastures.

Cinch from Dupont contains s-metolachlor. It is for preplant, preemergence or early postemergence control in corn.

Cinch ATZ from Dupont is Cinch with atrazine for corn

Cinch ATZ Lite is similar to Cinch ATZ, only with less atrazine.

Equip from Bayer contains foramsulfuron (Option) and iodosulfuron for use postemergence for corn less than 12 inches tall. It should provide increased broadleaf control, especially for up to 4-inch sunflower, velvetleaf, lambsquarters, and cocklebur.

Gangster from Valent is a copack of Valor and FirstRate intended for use as a pretreatment in soybeans. It is being marketed for use before Roundup Ready soybeans.

G-Max Lite from BASF contains Dimethenamid-P and atrazine. It can be used preplant, preemergence or early postemergence (under 12 inches) in field, seed or sweet corn. It has less atrazine than Guardsman Max. It is for control of black nightshade, pigweed, waterhemp, foxtail and crabgrass.

Keystone from Dow contains acetochlor and atrazine. It can be used preplant, preplant incorporated, preemergence, or early postemergence (under 11 inches) in field or sweet corn. It is for control of black nightshade, kochia, lambsquarters, pigweed, waterhemp, foxtail, and crabgrass.

Lumax from Syngenta contains s-metolachlor, atrazine, and mesotrione (the active ingredients in Bicep II Magnum and Callisto). It can be used preplant, preemergence, or early postemergence in field and seed corn. It controls black nightshade, kochia, lambsquarters, pigweed, sunflower, velvetleaf, waterhemp (including ALS-resistant types), foxtail and crabgrass.

Roundup WeatherMAX from Monsanto contains a potassium salt of glyphosate. It is labeled for many of the same uses as other glyphosate products including Roundup Ready crops. It is rainfast 30 minutes after application. Weathermax contains 5.5 lbs of active ingredient and 4.5 lbs of the acid equivalent. Roundup original had 4 lb a.i. and 3 lb a.e. This results in 22 oz of WeatherMAX equaling 1 quart Roundup or 32 oz of Roundup Original.

Steadfast ATZ from Dupont contains nicosulfuron and rimsulfuron and atrazine. It is for postemergence application in corn. It contains the same active ingredients as Steadfast only with more broadleaf weed control.

Brady Kappler
Extension Educator – Weed Science

Prospective crop plantings for Nebraska

As of March 1, Nebraska corn growers expected to plant 8.2 million acres in 2003, down 2% from last year but 1% above 2001, according to an April 9 report from USDA's Nebraska Agricultural Statistics Service. Of these acres, 40% are expected to be planted to insect resistant (Bt) varieties, 11% to herbicide resistant varieties and 4% to stacked gene varieties, compared to 34%, 9% and 4% respectively a year ago.

Nebraska soybean producers expect to plant 4.65 million acres in 2003. This would be the third highest of record, down 1% from last year but 6% below the record high set in 2001.

Sorghum growers expect to plant 650,000 acres, 44% more than in 2002, up 18% from 2001 and the largest total in five years. Hay acreage for harvest, at 3.1 million acres, would be down 5% from last year. Dry edible bean producers intend to plant 160,000 acres, down 14% from a year earlier. Sugar beet plantings of 42,000 acres would be down 26% from 2002. Sunflower planting intentions of 60,000 acres are up 3 percent.

Planter adjustments, steps to successful no-till

Planters and drills have to cut and handle residue, penetrate the soil to desired seeding depth, establish proper seed-to-soil contact, and close the seed-vee. Keeping these four items in mind, a producer can evaluate the strengths or weaknesses of any piece of planting equipment and make the adjustments or changes necessary to make no-till successful. Fortunately, most currently available planting equipment can be used for no-till with few, if any, modifications.

Planters and drills are now being built stronger and heavier with larger-diameter disk seed-furrow openers, making no-till easy. Check the double-disk seed-furrow openers on your planter now, before the planting season, for wear and proper adjustment. The individual disks can be adjusted inward as they wear by removing spacer washers from behind them. This keeps the two blades of the seed-furrow opener working together as one cutting edge.

If the two blades are mounted side-by-side, like on John Deere, Kinze, and White planters, there should be about 2 inches of blade contact on the leading edge. On staggered disk seed-furrow openers, like on Case-IH and Deutz Allis planters, the rear disk should be tucked in behind the leading disk, just touching. Adjust the disks or replace them to maintain the proper configuration. When properly adjusted, these seed-furrow openers can easily cut residue and penetrate the soil without coulters or row cleaners.

When no-tilling on well drained or highly erodible soils, leave the row cleaners up; residue left over the row will absorb raindrop impact. This will reduce erosion and crusting in the row and be a mulch to reduce drying of the seed zone. On poorly drained soils "spider wheel" row cleaners could be used to move the residue off the row to aid in soil drying. Unlike disk row cleaners, the spider wheel residue movers can be set to move only residue. If the soil is moved, any previously applied herbicides could be moved out of the row or the crop may be planted deeper into cooler soil. It also might form a furrow, which may wash out or crust over. In addition, if the soil under the residue is wet, soil disturbed by row cleaners or coulters will stick to the planter's depth gauge wheels and other components.

Getting the seed down through the residue and into the soil is the second important step of the planting process. The seed must be placed into moist soil, at a depth suitable for proper rooting and growth, 2 to 2.5 inches for corn. To ensure penetration to desired seeding depth, downpressure springs may be needed to transfer weight from the planter toolbar to the individual row units. There must be sufficient weight on the units to keep the depth gauge wheels in firm contact with the ground to control planting depth. If the gauge wheels are loose, tighten the downpressure springs or add heavy-duty springs. In addition, there needs to be enough total weight on the toolbar to keep the planter

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Field test planter adjustments with empty seed boxes

Now is the time to check on how well your planting equipment will perform. Take your emptry planter to the field as soon as weather and field conditions allow. Level the planter in the field, making sure that the toolbar is at the proper height and leveled front-to-rear, perhaps even slightly "tail" down. This allows for the full range of movement of the parallel links on the row units, helps keep the planter on the row, and aids in seed-to-soil contact. In addition, make sure that the planter carrying wheels are exactly centered between the rows and that they are carrying some weight. This is especially important if there are any ridges in the field from cultivation last year.

Once the planter is leveled, try blind planting with empty seed boxes. Stop with the planting units in the ground and check to see if the depth gauge wheels are in firm contact with the soil surface. If they are not, tighten the downpressure springs and try planting again. You may have to add weight to the planter for the springs to work against and to keep the drive wheels firmly on the ground. By putting a small amount of seed in a couple of rows, seed-to-soil contact and seed-vee closing can be observed as well. However, all these items should be rechecked when actual planting begins and as conditions change during the planting season.

Check the planter's performance by evaluating the four functions of seeding equipment. By checking residue cutting and handling, soil penetration, seed-to-soil contact, and seed-vee closing, one can make the adjustments or modifications necessary to solve any problems encountered. There is plenty of time to make adjustments or buy attachments, if needed, before planting begins.

With any piece of equipment, the owner's manual is the starting point for the initial settings and for making any adjustments. Valuable recommendations and trouble-shooting tips are in the manuals and also available from others who own and operate similar equipment.

Paul Jasa
Extension Engineer

Tips for no-tilling into heavy corn residue

Often producers are concerned about no-tilling into fields with large amounts of residue. The residue needs to be properly spread behind the combine during harvest of the previous crop, preferably with a straw chopper and proper chaff distribution. Minimize any residue disturbance (rolling stalk chopping or shredding) before or during planting. Leave as much residue anchored, attached, and standing upright as possible. That way you don't have to handle it and when you do run across it, the soil holds it so that the equipment can pass over it. The time and place to precondition corn residue is during harvest using knife-edged snapping rolls on the combine with the head running about 6 inches off the ground.

Adding planter weight

Today's planters have no trouble planting through heavy residue as long as weight has been added to the row units so they don't ride up over the residue, leaving the seed on the soil surface. For most planting conditions, raise residue movers so they run about 2 inches above the soil surface. At this height, they act as a "V plow" to lay the stalks to the side so that you only have to cut the stalks near the base.

For corn planting, set the depth control for about a 2.5- to 3-inch planting depth on bare soil so that when the depth gauge wheels run on the residue and over the root stumps, you are still putting the seed into the soil to at least a 2-inch planting depth. This is why weight is added to the planting units. Slow the planter to 4.5 or 5 mph so that you don't bounce over root stumps and add a "walking beam" depth control stop to John Deere planters if they don't already have one. If your double disk seed furrow openers are sharp and working together, they will cut down through the old root stump and put the seed into soil, even through residue from 250 bu/ac corn production. (Remember, the root mass you see forms about 1 inch above the seed at the nodal roots.)

For no-till, especially under heavy residue conditions, put a pop-up fertilizer in furrow, regardless of the soil phosphorus level (ie: 5-7 gal/ac 10-34-0). With the heavy residue, the soil may be a little cooler than if you moved the residue aside so the slower growing roots may have a temporary nutrient deficiency. The pop-up gets that seedling going and overcomes that problem.

Research in Minnesota on flat, poorly drained soils showed a yield response to pop-up fertilizer in heavy residue (regardless of soil phosphorus level) and showed a yield response to moving some residue out of the row, but not an additive effect. For Nebraska's conditions, most no-tillers should use the pop-up because shortly after planting, they will wish they had the residue back over the row to reduce soil crusting, conserve moisture, and reduce erosion. Also, disturbing the residue at planting makes planting much more difficult if the soil is wet under the residue. Without disturbing the residue, the depth gauge wheels of the planter ride on the residue and don't mud up, making planting depth much more uniform.

After planting, that residue over the row reduces the night time cooling of the row area by reducing the amount of heat radiating from the soil surface. The cooling when residue is removed leads to more stress on the seedlings because the seed zone isn't "buffered" with insulating residue. With the drainage of most of our Nebraska soils, the soil temperature difference isn't usually enough to worry about moving residue at planting time.

Seed placement

Many no-tillers also equip their planters with either Keeton Seed Firmers or Schaffert Rebounders to make sure that all the seeds are in the bottom of the furrow. Both of these devices can be set up to put the pop-up fertilizer in the furrow. The Keeton has the advantage of firming the seed into the seed-vee while the Rebounder is less likely to "mud up" in sticky clay soils. These devices quickly pay for themselves with more uniform seedling emergence. When it comes to yields, non-uniform emergence hurts you far more than non-uniform spacing.

In poorly drained soils

Some producers are no-tilling into heavy residue on poorly drained soils where moisture conservation and erosion control aren't concerns. They try to dry out the seedbed at planting time and don't want any residue over the row.

These producers maintain as much standing, anchored residue as possible to maximize air flow down to the soil surface. They run a large diameter fertilizer opener on their planter to cut the residue and to provide for 2x2 placement (nitrogen and any higher salt content fertilizers that might be needed). They run residue movers, usually free floating ones, very shallow to part the residue (easy to do as the residue has already been cut). They also use a pop-up fertilizer in-furrow.

Many of them run spoked closing wheels to further till the soil so that it dries out and drag chains behind the wheels to smooth the soil surface. Most of these producers plant either in the row middles or slightly off the existing row rather than down the old row, however some notice reduced yields in the wheel track rows.

Almost any successful no-tiller will tell you that crop rotation is a key to success, especially under heavy residue conditions. Very few like to no-till corn-on-corn. Those who do say weight for penetration, a pop-up fertilizer, a soil insecticide, and the right hybrid to handle the stress are keys to making it work.

Paul Jasa
Extension Engineer

Selecting corn hybrids, planting dates for no-till

Hybrid selection is an important decision in corn production, particularly when selecting a hybrid to no-till plant into winter wheat stubble. Additional factors must be considered when selecting hybrids for this type of system, including seedling cold tolerance and maturity. The residue protects the soil surface, causing the soil to be cooler at planting time and through much of the growing season. Soils also dry more slowly in the spring, so planting may be delayed.

With the cooler soil temperatures, germination and seedling development are slower in the spring. The cool soil environment tends to make a mid-season hybrid planted into standing wheat stubble about as late as a full-season hybrid grown in a tilled system.

The use of spider wheel residue movers on the planter will help warm up the soil and also reduce or eliminate hairpinning residue in the seed furrow. Be careful not to remove the herbicide if applied preplant. Also, starter fertilizers applied in or near the seed furrows will help the young corn plant become established.

Crop producers must give as much thought to hybrid selection as any other management decision. Using the wrong hybrid can wipe out all the potential gains from other correct decisions.

Hybrid maturity

Full-season hybrids have the greatest yield potential. A mid-season hybrid at one location may be a full season at another location as length of season varies greatly across the state. Length of growing season is affected not only by the number of days from the last frost in the spring until the first frost in the fall, but also by latitude and altitude. The field microclimate associated with residue cover greatly influences plant response to climatic conditions.

The biggest risk is selecting hybrids that are too extreme in maturity. A short-season hybrid has a lower yield potential in comparison with a long-season hybrid; however moisture limitations and/or frost may limit performance of the long-season hybrid in some years. The most frequent problem is with corn hybrids that are too full season. If a full-season hybrid has been used under conventional farming methods, it probably will be too late for a no-till system. A mid-season hybrid for the area probably will be preferred.

Available soil moisture

At planting time, the only real guide to the crop year is the amount of stored moisture in the soil profile. Within limits, it can be used to help decide how late the hybrid maturity should be. The more stored soil water available, the later you can stretch the maturity range in hybrid selection. But use this guide sparingly. Do not go to the extreme unless you are ready to assume the risk of a crop badly damaged by early frost or drought.

Full-season hybrids also are more risky if high populations are used. The better option with higher amounts of soil moisture is to use a mid-season hybrid, but increase the planting rate. If full-season hybrids are used, reduce the plant population.

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No-till adjustments *(Continued from page 45)*

drive wheels in firm contact with the ground to prevent slipping and to help keep the planter on the row.

Having enough weight becomes more of a problem with drills simply because of the number of rows per unit width. For instance, a six-row planter on 30-inch row spacing may require more than 3,000 pounds of weight just for cutting the residue and penetrating the soil (six rows times 500 pounds per row). Whereas, a drill of the same width on 7.5-inch row spacing has 24 openers and may require more than 12,000 pounds.

Sufficient weight must remain on the press wheels to ensure firming of the seed into the soil. Wet soil is easily compacted and care must be taken not to over pack the soil, making it difficult for seedling roots to penetrate the soil. In dry soil conditions, extra closing force may be needed. The key is to evaluate seed-to-soil contact, not the top of the seed-vee. As long as the contact is there, something as simple as a harrow that acts to close the top of the vee and pull light residue cover back over the vee may be all that is needed. This is a common practice on drills that use a narrow press wheel.

A wide variety of attachments are available to improve seed-to-soil contact and seed-vee closure. Unfortunately, some were designed to overcome specific problems and may be less effective or even detrimental in other conditions. Before buying attachments, evaluate any planter problems and how the attachment may function to solve the problem or if it just creates another problem.

With appropriate weight, downpressure, and adjustments, most current planters and drills will perform well in no-till conditions. A little time spent now will help avoid headaches and delays later during the planting season.

Paul Jasa
Extension Engineer

No-till corn planting dates *(Continued from page 47)*

Hybrid characteristics

A hybrid that has good tolerance to stress is important in non-irrigated conditions. This includes the ability to produce at least some yield under low soil water conditions and the capability to produce a high yield when adequate soil water conditions are present. Also, tolerance to seedling diseases, extended periods of hot weather, high winds and low humidity are important.

A hybrid that can produce good yields at lower plant populations also is critical. Because of limited moisture, no-till, dryland corn is planted at lower plant populations than irrigated crops, but the hybrids need to be able to respond when adequate moisture is present.

There are a number of other factors that need to be included in the selection of corn hybrids. These include plant and ear height, resistance to corn borer, resistance to stalk rot, stalk strength and strong root systems.

Hybrid information

The most important source of data is a farmer's own yields under specific soil, climatic and management conditions. There are other ways to obtain comparative yield data on hybrids, as well.

One objective source is the latest report on the Nebraska Corn Hybrid Test. Several of these tests are conducted annually across the state, and the results are published in UNL Extension Circulars. Farmers can check the data from the sites closest to them to get an idea of how various hybrids performed under comparable conditions.

Each company is limited in the number of hybrids it can enter in these tests. The data from the tests include yields, plant populations, moisture at harvest, broken plants and dropped ears. This information is most valuable if averaged over several years, since yields of only one year may be influenced by environmental extremes.

Seed company tests are another source of yield information. The closer the test conditions are to a farmer's conditions, the more reliable the data. These tests are most valuable in comparing hybrids within a company. Farmers should do some experimenting with hybrids on their own farms, as well.

On-farm hybrid tests

Try one bag of each of several hybrids that have the potential to be grown on your farm. It is important to check the hybrid at least two years before planting a sizeable acreage. Use every available source of information to make this difficult decision.

Soils under residue are cooler than bare soils. Early plantings generally yield higher than later plantings, but keep in mind that soils early in the season will be cooler. If you want to plant corn in late April or early May, pay particular attention to the five day weather forecast. If the forecast is for normal or above normal temperatures and sunny days, it probably will be fine to plant corn. If the prediction is for cloudy days and cool temperatures, you probably should wait for more favorable conditions.

By mid-May, plant corn regardless of the predictions, since warmer temperatures are ahead and the cool soil shouldn't last long enough to damage germination too badly.

For additional information on planting no-till corn see NebGuide 884, "Ecofarming: Selecting Corn and Grain Sorghum Hybrids, Planting Dates, and Planting Rates in a Winter Wheat — Row Crop Fallow Rotation." (It's available online at *http://www.ianr.unl.edu/pubs/fieldcrops/g884.htm*).

Robert Klein
Extension Cropping Systems Specialist
Drew Lyon
Extension Dryland Cropping Systems Specialist

Plan herbicides for possible later forage crops

When selecting herbicides for your corn, beans, milo, and other crops, consider whether there's a possibility of a pasture, hay or silage crop in that field in the next year and a half.

Many of our biggest success stories with forage and pasture crops recently have come from using annuals. No matter when you could use something to graze, including winter, an annual plant exists that could work well if managed properly. Many times a small grain like oats or rye fits our needs or a brassica like turnips or a millet may fit the bill. Also consider, however, the potential for later frustrations, one of the biggest of which are problems related to herbicide carryover. Many annual forages are sensitive to herbicide carryover, especially atrazine. Often we identify a forage crop to plant but the risk of failure is too high due to herbicides. This problem isn't limited to annual forages. Perennial cool-season grasses and alfalfa also are sensitive to herbicide carryover.

If you answer yes to one of the following question, you might want to reassess your herbicide options this spring. Interested in flying rye or turnip seed into your standing corn later this year for extra fall pasture? How about planting triticale this fall or oats next spring? Or maybe irrigated pasture or alfalfa.

These options may not be available if you use herbicides like atrazine, Pursuit, Hornet, Command, or Treflan. Rethink your herbicide plans and keep your options open. Maybe you can control weeds and maintain the flexibility to plant forage later.

Bruce Anderson
Extension Forage Specialist

Recent snows help, but water resources still expected to be limited in western Nebraska

Snows ranging from 8 to 12 inches in central Nebraska and 2 to 8 inches in eastern Nebraska brought needed moisture. Only the extreme southern counties of southeast Nebraska escaped significant snow accumulations.

With temperatures close to freezing during this event, snow to water ratios were above average. In liquid equivalent terms, most central Nebraska locations received 0.80 - 1.20 inches of precipitation. East central Nebraska had totals of 0.50-1.00 inch, while southeast and south central had 0.25 - 0.75 inch. Most of the western quarter of the state received less than 0.50 inch of precipitation.

Since the large snow storm hit Colorado in mid-March, there has been a regular procession of storm activity across the central plains, with the strong systems occurring at 7-10 day intervals. The upper air low in the Gulf of Alaska continues to shoot energy into the central Rockies, which in turn is helping generate strong low pressure at the surface. As long as this pattern continues, Nebraska should receive normal to above normal precipitation.

As these lows move from the central Plains east-northeast, they are weakening and losing their ability to tap the Gulf of Mexico for additional moisture. The eastern Corn Belt has been receiving precipitation, but levels have been 30-50% below normal for this season. If this continues into early summer, the eastern Corn Belt may be looking at serious drought concerns.

The latest information on levels for Lake McConaughy were released at the Governor's Climate Assessment Response Committee (CARC) meeting April 3. Lake McConaughy is expected to peak at 815,000 acre/feet. Currently it stands at 800,000 acre/feet, compared to the 2002 spring peak of just under 1.1 million acre/feet. Approximately 70,000 acre/feet is reserved for the wildlife trust account. The Central Platte Public Power and Irrigation District (CPPID) representative could not specify when this water would be released for downstream wildlife issues; however, CPPID guarantees a full water allocation for this year's growing season.

Current flows downstream of Lake McConaughy resulted from CPPID releasing water to help fill small irrigation lakes such as Sutherland reservoir. The CPPID representative stated that if normal temperatures and precipitation return to the state during the growing season, lake McConaughy levels would dip to 500,000 acre/feet by the end of the irrigation season. However, if this summer is a repeat of last summer, the lake level could drop to 300,000 acre/feet of water.

The heavy snows in Colorado and Wyoming likely will not have a significant bearing on the Platte River unless there is rapid runoff due to much-above-normal temperatures. This type of situation would result in above normal flows on the southern Platte River, which in turn would allow CPPID to hold back more water instead of releasing it to meet downstream needs. Normal temperatures and precipitation this spring would delay water deliveries into June and extend the resource into late August or early September.

The Republican River basin continues to be a problem. Accumulated streamflow volume since Jan. 1 is considerably below last year's record setting year. Although rainfall and snowfall have been welcome over the last 30 days, three plus years of drought without significant snowfall have taken their toll on the basin. Unless heavy rainfall and associated flooding occur throughout the valley this spring, water restrictions may be likely for irrigators.

Al Dutcher
State Climatologist

Weather data updated daily online

Precipitation data for 92 sites across the state is updated daily on the *CropWatch* web site at *http://cropwatch.unl.edu/weather.htm.* Soil temperature updates are available for 36 Nebraska locations. Daily GDD and ET updates will be added as the growing season begins.

Precipitation and soil temperature data is represented both graphically on state maps and in tables of numerical data. Precipitation data is provided for actual and percent of normal for four periods. Soil temperatuare is recorded at the four-inch level and includes the average for the last week, the departure from normal and the high and low soil temperatures for the past week.

Data for these tables is provided by Al Dutcher, state climatologist in the UNL School of Natural Resource Sciences.

Average soil temperatures April 3-9 ranged from 39.3°F at Gordon to 51°F in Lincoln. Departures from normal ranged from -4.8 at Alliance to a +5.1 at Clay Center.

For precipitation, the state average for January 1 - April 9 is 2.88 inches or 93% of normal and for September 1 - April 9, the state average is 7.13 inches or 87% of normal.

Check sprinkler heads for wear, correct placement

When performing preseason maintenance of your irrigation system, don't forget to carefully check sprinkler heads. A sprinkler head in the wrong place or not operating correctly can affect the amount of water applied and eventually the yield.

Sprinkler nozzle wear depends on the quality of the water and the system operating pressure. Heads on sprinkler systems operating at high pressure with low quality water will need to be replaced more often than those on low pressure systems. Inspect the system to identify sprinklers that are plugged, badly worn or not operating properly. Consider replacing sprinkler heads after about 6,000-7,000 hours of operation. Systems that pump a lot of sand may need to be replaced more often.

Sprinkler wear occurs at the nozzle outlet and at the seal located at the base of the sprinkler. Wear to the nozzle outlet allows increased flow that could potentially decrease water distribution uniformity. Check nozzle wear by inserting a properly sized drill bit into the nozzle opening. You will need drill bits with size increments of 1/128 inch to test all possible nozzle openings. If the drill bit moves easily from side to side, the nozzle is badly worn and may need to be replaced. This is also true for the nozzle portion of spray heads.

Applying as little as 10% less water per revolution could mean up to a 10-bushel yield loss for the acres irrigated by that one sprinkler.

The seal at the base of the impact sprinkler is the wear plate that allows the sprinkler to rotate. After years of wear, the seal begins to leak, beginning with a small dribble and increasing to streams that can begin to impact sprinkler rotation. When leaks become noticeable, replace the sprinkler head.

Sometimes a sprinkler or nozzle fails or is lost from the pivot pipeline during operation. Producers often have spare sprinkler heads in their pickups for just this occasion. Unfortunately, only on rare occasions does the available sprinkler head match the one needing to be replaced. Now is the time to check through all the systems and make sure that the sprinklers are on the system in the right places.

Water application uniformity hinges upon having the right sprinklers in the right places. This is particularly true during abnormally dry summers because nonuniform water application can mean lost yields. Applying as little as 10% less water per revolution could mean up to 10 bushels less corn yield for the acres irrigated by that one sprinkler.

Some sprinkler issues can be identified by keeping good records. Regularly recording system flow rate and pressure may indicate that the nozzle opening has changed or leaks have developed. Each year take time to verify that the sprinklers are functioning properly.

Bill Kranz
Extension Irrigation Specialist
Northeast REC

Irrigation maintenance checklist

Each irrigation system will have many areas that need lubrication, new parts, and bolts tightened prior to the first irrigation event. It is impossible to list all the items to check, but the preseason list should include:

1) Change the engine oil and filter.

2) Clean and replace the air filter.

3) Check drive belts (if any).

4) Grease all drive shafts on pump and motor.

5) Clean, gap or replace spark plugs on gas or propane engines.

6) Replace fuel filters.

7) Check and clean the battery power cables.

8) Drain, flush and refill the cooling system.

9) Drain and replace the lubricating oil in the pump gear drive.

10) Refill the drip oil reservoir and allow approximately 1/2 gallon of oil to drain into the drip line.

11) Check the gear drive to be sure it is free moving and clean the nonreverse pins with an emery cloth; lubricate each pin.

12) Make sure all safety shields are in place.

13) Start the motor and allow it to run at 1000 rpm for 30-60 minutes to distribute the oil and check for leaks in the oil or cooling systems.

14) Check the operation of the chemigation safety equipment.

Check the owner's manual for your system for other components of the pump or motor that may need to be lubricated, repaired, or replaced.

Bill Kranz
Extension Irrigation Specialist
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