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Crop Watch No. 2004-22, September 24, 2004

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CROP WATCH

University of Nebraska Cooperative Extension
Institute of Agriculture and Natural Resources

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No. 2004-22, September 24, 2004

Actively manage crop harvest to limit losses

In a year like this when yields are expected to be above normal, harvest losses may be less visible. A drop from 150 to 130 bushels per acre hardly seems worth noting for a field that may have produced just 10-20 bushels per acre last year. But this year's high yields are only as good as the crop that actually makes it from the field to the bin. Every bit of grain lost during harvest and storage is income or feed value that's lost to your operation.

To get the most yield from your crop, actively manage the combine operation as part of a total harvest system. Take advantage of the monitors and technologies available on your combine to guide adjustments and improve harvest efficiency and productivity. Following are a few tips to aid your harvest operation.

First, ensure that harvest equipment is clean and in working order before harvest starts. Thoroughly examine the combine and grain trucks with a critical eye. Look for wear or damage to belts, bearings, and hoses. Double check truck beds for leakage — two to three bushels a trip can add up. Review maintenance records and if necessary, the owner's manual, to help determine if it's likely that a critical part may need to be replaced during harvest. Either replace worn parts or have them readily available on-farm so harvest delays can be minimized. To help minimize grain damage, smooth or file down any sharp or rough edges that are likely to contact grain.

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A bountiful crop is only as good as the grain that makes it from the field to market or storage.

Inside

Climate conducive to Sclerotinia stem rot and Cercospora blight

We have seen two diseases in soybean this year that have not been widespread in the past several years. Many producers and commercial agriculture clientele are reporting *Sclerotinia stem rot* (white mold) in soybeans this year. In some cases fields are being severely affected with over 25% of the field being lost.

More commonly, there are isolated pockets in the fields dying from Sclerotinina. Symptoms of this disease became evident about one month ago, but conditions which favored development of the disease occurred earlier, during the flowering period for soybeans. For Sclerotinia to develop we must have cool, wet conditions which we had in July over most of the state. Many

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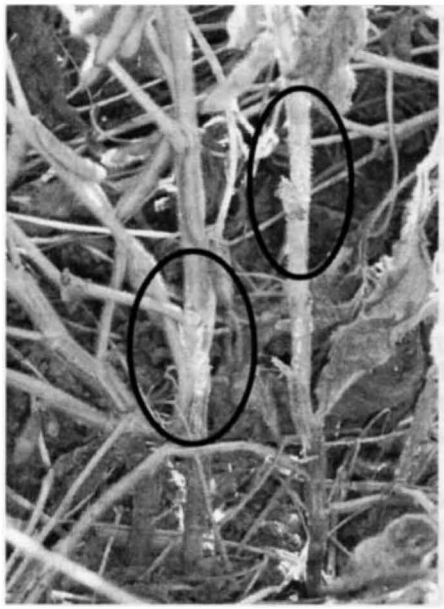

Nebraska's climate this summer was favorable for increased development of Sclerotinia stem rot, also known as white mold.

Ag briefs and updates

Paul Hay, Extension Educator based in Gage County: Strong progress on soybean harvest continued over the weekend. Dryland yields reported in the 35-40 bushels per acre. A few producers are no-tilling wheat into stubble, others are waiting for rain. Dryland corn fields look good with yields over 100 bushels per acre. Milo has made good progress in the last three weeks of warm weather and most fields will mature to harvest.

Gary Zoubek, Extension Educator in York County: Things have really changed the past week. Soybeans have dried down rapidly and soybean harvest is in full swing! Yields have been variable with some better than expected dryland yields. I've had reports of 25-50+ dryland yields. Some irrigated yields, however, have been less than expected. I've had reports of 50-75 bushel per acre irrigated yields. The problem with green stems varies greatly depending upon field, varieties and other factors.

Gary Lesoing, Extension Educator based in Nemaha County: Harvest began last week and is in full swing. Soybeans are dry, 10-13% moisture, although there are some green beans coming in. Soybean yield reports are generally good, ranging from 45 to 60 bushels per acre. Corn harvest also has begun with moistures of 14-19%. I have heard one dryland corn yield report of about 150 bushels per acre.

Farm Credit Services Sale. *Understanding the Proposed Sale of Farm Credit Services of America* is a new Web site hosted by Iowa State University. It provides history and background on the Farm Credit Systems Bank and analysis of the proposed purchase by Rabobank.

In July, Rabobank, a Dutch bank, announced plans to buy the Omaha-based Farm Credit System bank, which serves farmers in Iowa, Nebraska, South Dakota, and Wyoming. AgStar, a Farm Credit bank in Minnesota, has also made a proposal. The site, available at *http://www.econ.iastate.edu/rabobankbuyout/*, states: "These actions, unprecedented in the 87-year history of the cooperative Farm Credit System, have created a strong demand for objective, timely information and analysis on the specifics and consequences of the options facing FCSA members and other stakeholders.

"This site includes information, analysis and links to resources that will be of value to FCSA members, as well as with other interested parties."

Crop report: Above normal temperatures last week pushed soybean maturity ahead of last year and average and quieted concerns about frost and harvest. Maturities had been lagging one to two weeks behind normal as unusually cool temperatures were the norm in late summer. According to USDA's Nebraska Agricultural Statistics Service report of September 20, last week's temperatures averaged 4-11 degrees above normal.

Following is an update on crop conditions as of September 19, as provided by NASS:

Corn rated 3% very poor, 6% poor, 20% fair, 46% good, and 25% excellent, above last year and average. Irrigated fields rated 80% good and excellent while dryland fields rated 58%. This compares to 75 and 12, respectively, a year ago. Harvest was 4% complete.

Soybean condition rated 4% very poor, 12% poor, 29% fair, 43% good, and 12% excellent, still well above last year and average. Leaves had dropped on 57% of the acreage. Harvest was 6% complete.

Sorghum condition rated 4% very poor, 12% poor, 43% fair, 35% good, and 6% excellent, still well above last year and average. About 82% of the fields were showing color, and 15% were mature.

Dry bean condition rated 6% very poor, 16% poor, 26% fair, 44% good, and 8% excellent. Seventy-nine percent had turned color, well behind last year at 94%. Harvest was 8% complete.

Proso millet harvest progressed and was 30% complete.

Wheat seeding progressed to 48%, ahead of average at 50%. Fourteen percent had emerged.

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Combine adjustments *(Continued from page 203)*

Second, if you're using yield monitors and other gauges, check to be sure they're properly adjusted and calibrated to provide accurate readouts. Making "on-the go" decisions based on inaccurate information can be costly.

Third, adjust your combine for current conditions and expected yields. This is especially important for dryland corn and soybean producers who may have made combine adjustments the last two years to handle lower yields. Check the owner's manual and readjust settings, such as for the cylinder or rotor and concave. Many of these changes are fairly easy to make now – often from the cab – but if overlooked, can contribute to crop damage or losses.

Fourth, once these adjustments are made, continue monitoring the process throughout the day and be prepared to readjust settings. Conditions in mid afternoon may be totally different from when you started in early morning. Check the amount of crop material going into the grain tank as well as the amount of grain that may be lost out of the back of the combine.

Spot checks in the field throughout the day can be very important and eliminate unnecessary losses. Air temperature, crop moisture, soils, and crop variety can vary from one field to the next and through the day. With an especially warm day and a steady southerly breeze, crash drying can occur and moisture can drop by up to 5%. Managers should stay on top of the changes and adjust the combine accordingly throughout the day and again the next morning. With today's monitors farmers can do a lot of management from the cab, but they also need to get out of the cab intermittently to check for losses.

Always try to run the combine at full capacity to increase harvest efficiency and reduce grain damage. With too little crop going through, the action can become too aggressive and the grain will be damaged. Maintaining grain quality pays through better prices at the elevator or grain that stores better with fewer complications.

Combines are designed to work best when there's a consistent flow of grain. When the amount of grain going into the combine drops by half, each kernel or bean suffers two to three times the number of blows from the cylinder and concave. With high yield areas it may be necessary to slow down so as not to overload the system and in lower yielding areas, it may be necessary to speed up some. Remember that while increasing combine speed may increase the flow and the quality, it also can introduce more plant material and increase separation losses. At the onset of harvest in the field, check to see if there are any losses and if so, the source of those losses, such as from the header, thresher, or separator.

Taking a little time at the onset of harvest and intermittently throughout harvest can help ensure a productive and successful harvest.

William Campbell
Extension Agricultural Engineer
Lisa Jasa, CropWatch Editor

Frost predictions move to October

Portions of Nebraska received generous rainfall earlier this week due to a strong upper air trough of low pressure air slowly moving through the western United States. Rainfall totals over one inch were common across the western and eastern thirds of the state, with local totals approaching three inches. This moisture should help provide an excellent environment for wheat planting and emergence this fall. The same storm system also dumped snow across the central Rocky Mountain states of Colorado, Utah, and Wyoming.

The coldest pocket of air associated with this strong trough remained west of Nebraska and thus freezing temperatures did not develop across the western third of the state, as had been expected. It appears that the next significant chance for freezing temperatures will not occur before October 8. As this trough moves northeast of Nebraska, high pressure will build back into the central United States. If models are correct, an active weather pattern with occasional shots of moisture will continue for the next few weeks.

It does appear that a weak El Nino is beginning to form in the Pacific Ocean and is forecast to slowly strengthen over the next few months. Typically an El Nino would begin forming in July-August, so this event is unusually late. At present, models project a weak event with impacts expected in December-March. If this event becomes a player in our weather pattern, expectations are for above normal temperatures for December-March, with an increased likelihood for late season snow in the central Rockies and western High Plains.

If the present weather pattern continues through fall, temperatures should remain below normal across the northern and central plains, with normal to above normal precipitation in response to southward movement of the northern jet. As El Nino strengthens, the northern jet will weaken and give way to a strong southern (tropical) jet stream pattern. Instead of cold dry snowstorms, wet snow and warmer than normal temperatures should occur as storm systems traverse the southern third of the United States in late winter.

Al Dutcher
Extension State Climatologist

Calibrate yield monitors carefully for best results

When properly calibrated, a yield monitor can be a valuable tool to gather information about crop production. The monitor provides on-the-go estimates of yield and grain moisture content. It records the total weight and average moisture content of each load harvested, a high tech replacement for a weigh wagon. When used in conjunction with a global positioning system (GPS), it can estimate the yield at every location in the field. This geo-referenced data can be used to develop a map of yield variability across the field.

A yield monitor consists of several sensors and a small computer to integrate, display, and save the information. On most yield monitors, the grain flow through the combine is estimated by measuring the force the grain exerts on a sensor at the top of the clean grain elevator. The greater the grain flow, the greater the force or displacement measured. The area harvested is determined from the measured travel speed and the known width of cut. Grain moisture content is also measured so that the grain yield can be corrected to a standard moisture content.

In reality, the output from the sensors on the combine are not grain yield and moisture content but only millivolts. Proper calibration involves weighing the grain in a load using a scale and measuring the moisture content with a standard moisture tester. These numbers are entered into the yield monitor's computer, allowing the computer to assign mass flow rates and moisture contents to the millivolt readings sensed. This calibration must be performed separately for each crop. A publication by The Ohio State University, *Checklist for Yield Monitor Operation and Calibration*, provides further information and is available online at *http://precisionag.osu.edu/library/ymonitor.html*

Nebraska farmer Chuck Myers heads to a field south of Lyons to harvest corn with his yield monitor equipped combine. (File photo)

Unfortunately, many producers think that calibration consists of harvesting a combine bin full of grain, calling that a load on the yield monitor, and weighing that load on a scale to get the bushels harvested, using that as input to the yield monitor. Later they may harvest several bins, weighing them all as one truckload, and inputting that number into the monitor as another calibration point. They think they have entered two calibration loads, or more if they do more truckloads.

This procedure actually only provides one calibration point -- based on the average mass flow through the combine at "normal" operating conditions, usually full load. The proper calibration procedure for most monitors usually consists of harvesting several loads, under various mass flow rates, to calibrate the mass flow sensor across the variety of flow rates that occur during harvest. The first load may be at normal operating conditions like the producer above. However, the next loads should be at reduced mass flow rates, like 1/2 speed (**or** 1/2 width of cut) and 3/4 speed (**or** 3/4 width of cut) and 1/4 speed (**or** 1/4 width of cut), and so on to get a variety of flow rates. If varying speed, keep the width of cut constant, or likewise, if varying width of cut, keep the speed constant. This calibrates the mass flow sensor for the high and low flow rates that occur when harvesting high and low yielding areas in the field. Consult the yield monitor owner's manual for the proper procedure recommended, especially for the number of loads required for proper calibration. Follow the directions and don't skip calibrating the low flow rate loads, thinking it is waste of time to operate the combine at such reduced capacity.

Most yield monitors can show grain flow rate through the combine (in bushels per hour). Research and experience has shown that an improved calibration can be obtained by using this reading on the display to operate the combine during calibration. Rather than

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Recommendations for quality grain storage

Successful grain storage and management is a long-term operation, starting when the grain is placed in the bin and continuing until it goes to market. As such, it can have a major impact on the total income you realize from your crop. The following reminders are included to help you maintain your crop's value throughout the storage period.

♦ **Avoid temperatures over 140°F in high heat, high capacity dryers** because higher temperatures will result in excessive grain damage and broken kernels.

♦ **Also avoid flash cooling** because this will result in cracked and broken kernels.

♦ **If you have the bins and equipment available, move the grain out of the dryer to a drying bin while the grain's still hot and two points above the target moisture content.** Let the first grain to enter the bin steep with no airflow for four to six hours before starting the aeration system. (Additional grain can be added to the bin after the fan is started). Allowing the grain to steep provides time for the moisture in the middle of the kernels to redistribute, lessening the difference in moisture between the outer and inner part of the kernel. This results in more efficient drying and fewer stress cracks in the grain. Finish drying and cool with natural air. If fan size is marginal (<1 cfm/bu when the bin is full), it is better to partially fill several bins rather than filling each bin to capacity before filling the next bin.

♦ If using heated air for batch-in-bin drying, avoid temperatures over 120°F. Little is gained in terms of shorter drying times and more kernel damage occurs above these temperatures for in-bin drying systems. Adjust the depth of grain according to moisture content above so grain can be dried to within one percentage point of the target storage moisture within two days (see the September 3 *CropWatch* for recommendations). Finish drying with low heat or natural air to the final moisture content in another two days and then cool the grain to 50°F as soon as the air temperature allows.

♦ After the grain is dry and cooled initially, plan to move one cooling zone per month through the grain until it is cooled to 30-40°F.

UNL model shows how drying grain in layers can significantly speed up the storage process.
See page 212

This will effectively prevent insect activity in the grain since nearly all insect activity stops at temperatures below 50°F. Cooling all the grain to a uniform temperature will help prevent convection currents from forming in the grain. These can result in a wet spot in the top center of the bin and grain degradation.

♦ **Don't run the aeration fan if the air temperature is below 25° F unless absolutely necessary.** If aeration during colder weather cannot be avoided, it is best to re-warm the grain to 30°F as soon as the air temperature moderates. Don't wait until spring to warm a bin of grain that is below freezing. The moisture in the warmer springtime air can form a frost or ice dam in the frozen grain, making it nearly impossible to push air through it.

♦ **Check grain condition frequently**. Check stored grain with a temperature probe at least once a month (twice a month is better). If the temperature probe shows more than a 10 degree temperature difference between the sidewall compared to the center of the bin, the aeration system should be operated until the entire grain mass is a uniform temperature. Pushing a temperature front through the grain can take one to several days — depending on the size of the fan relative to the number of bushels in the bin.

To estimate the hours required to push a cooling front through a grain mass, divide 15 by the airflow rate in cubic feet per minute per bushel. For example, if you have a drying bin with a fan that delivers one cubic foot of air per minute per bushel (cfm/bu), it would take about 15 hours to push a cooling front through the grain. If the bin is equipped with a small aeration fan, rather than a drying fan, it may take several days to push a cooling front through the grain. For example, if the aeration fan produces 1/5 cfm per bushel, it would take about 75 hours to push a temperature front through the grain mass.

♦ **After probing to check the temperature, start the aeration system and note the temperature and smell of the air coming through the grain.** If you detect a musty smell or if moisture condenses on the bin roof on a cool day, the aeration system should be run to bring the grain mass to a uniform moisture content and temperature throughout the bin. If you detect possible problems and if you have stirring devices in the bin, run them for a round or two while aerating.

In summary, the secret to having good quality grain coming out of storage, is to store good quality grain in the first place. Harvest it with clean equipment, put it in clean bins, dry it to a safe storage moisture content as soon as possible after harvest, then cool the grain to prevent insect and mold activity. Finally, check grain condition at least once a month and keep the temperature uniform throughout the grain mass by periodically running the aeration fan.

Tom Dorn, Extension Educator
Based in Lancaster County

Soybean diseases *(Continued from page 203)*

fields in Nebraska have at one time or another had Sclerotinia present in the field and the fungus is just waiting for a year like this to start disease development.

Fields with a history of continual Sclerotinia stem rot problems should be planted to soybean varieties rated with higher tolerance to the disease. The use of narrow rows is also not recommended in these fields and it has also been shown that higher plant populations can increase the amount of Sclerotinia stem rot in a field. As this year was not typical for most in Nebraska, I would not recommend significant changes to your variety selection if you observed only an isolated pocket of this disease in your field.

Fields with severe Cercospora blight should be among the first harvested.

The other disease problem we have observed this year is Cercospora blight. Symptoms of Cercospora blight occur on the upper leaves which are exposed to the sun. Light to dark purple areas of discoloration occur and leaves will have a leathery appearance. This develops into angular to irregular lesions on both the upper and lower leaf surfaces. Veinal necrosis can also be observed as the disease progresses. Green leaves will be present below the area being affected. Reddish purples lesions also will occur on petioles and pods.

Cercospora kikuchii -- the fungus that causes Cercospora blight -- is the same fungus that causes purple seed stain. This disease is widely distributed in Nebraska and occurs every year at low levels. However, this year we have had excellent conditions for its development. While this disease generally does not reduce yield at the levels observed in Nebraska, it will reduce seed quality and can impact seedling quality if planted next year.

Conditions were excellent this year for the development of purple seed stain in soybean.

Fields with severe Cercospora blight should be harvested among the first. Conditions that favor purple seed stain are when wet weather delays the harvest or when warm, wet weather hits when plants have begun to reach maturity (growth stages R7 and R8) or when pods are completely brown. Most of the fields I have seen with severe Cercospora blight are in the earlier maturity groups around 2.5. Symptoms of purple seed stain are purple to pink streaks on the seed coat. Discoloration can range from streaks to large blotches. The fungus grows into the pod and spreads though the hilum, resulting in seed discoloration being centered on the hilum. In some cases the entire seed may be discolored.

Seed lots with a high percentage of purple seed stain are not recommended for planting since they may produce weakened seedlings. Rapid dry-down prevents seed infection and recent cool weather slows the rate of fungus growth, but if moisture continues into harvest I expect there to be an abundance of this discolored seed.

In varieties showing severe Cercospora blight, I would not recommend eliminating them from potential varieties for next year, as this was such an atypical year for Nebraska production and most likely, this disease will not be as severe next year.

Loren J. Giesler
Extension Plant Pathologist

Forestry Field Day this Saturday

"Trees for the Good Life" is the theme for Forestry Field Day 2004, to be held this Saturday (September 25) at Horning State Farm near Plattsmouth.

Free activities will begin at 10:30 a.m. and tours will continue to 2:30 p.m. Hayrack tours will pass through woodlands and tree research plantations and the walking tours will help participants develop basic tree identification skills. Added attractions include educational exhibits, sawmill and post peeler demonstrations, tree grafting demonstrations, and master wood turners.

Event sponsors include University of Nebraska Cooperative Extension, Nebraska Forest Service, Nebraska Statewide Arboretum, and the Lower Platte South Natural Resources District.

Yield monitors

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varying the speed or width of cut for each calibration load, the flow rate should be held constant within a load and varied between loads. This is achieved by using the hydrostatic drive to vary the ground speed to keep the flow rate fairly constant for each load. For instance, if during normal operating conditions for harvest the grain flow rate is 1800 bushels per hour, calibration loads should be run at 600, 900, 1200, 1500, 1800, and 2100 bushels per hour. This method provides a better calibration of the grain's actual flow rate across the sensor.

When comparing the scale weight of a truckload to that recorded by the yield monitor, producers should resist the temptation to input an "extra" load or two at full load conditions, trying to improve the calibration. For each load entered at full load conditions, the corresponding loads should be entered for all the reduced flow rates to keep the sensor calibrated across the full range of operation. Extra data points at full load conditions can skew the calibration curve so that values recorded at anything other than full load may not be accurate.

Even with the best calibration procedures, the yield monitor will still have some errors. Yield monitors should not be used to determine the exact yield of a field or portions of a field (and are not legal for trade); rather, they are a valuable tool for exploring relative yield differences from various areas of the field, one of the many starting points for site specific crop management. There are several methods to help clean, filter, and correct yield monitor data to reduce the effects of some errors, but proper calibration across the range of flow rates harvested is still a must.

Paul Jasa
Extension Engineer

As harvest equipment gears up

Ensure child safety on farm

Farming ranks as one of the most dangerous occupations in the United States, with children often facing the biggest risk for injury, a University of Nebraska Cooperative Extension engineer said.

Safety risks for children vary depending on age, but for those 15 and under, the biggest risk is being run over by farm equipment, said Dave Morgan, extension safety engineer in the University's Institute of Agriculture and Natural Resources.

"Since 1969, farm equipment has been the leading cause of injury for kids," he said.However, taking on-the-job precautions can minimize physical risks for both children and farmers, he said.

"Teach kids that machinery and equipment are not places to be playing, and neither are grain bins, especially if you have automatic unloading equipment," he said.Farmers should develop "no play areas" to park machinery in and never park in a play area, Morgan said. Fenced play areas increase safety, especially for younger children.

Following farm equipment accidents, tractor overturns, harm from animals, suffocation and falling off vehicles are the most common on-farm lethal incidents, according to the Department of Biological Systems Engineering statistics. Children being carried along as extra riders on farm and lawn care equipment continues to be a concern, Morgan said. It is difficult for operators to have full attention to the operation of the machine if they have a child on their lap or riding along or on a fender, he said. Unless there is an extra seat and a seatbelt, children should not be allowed to ride along.

When children are helping care for farm animals, they also need to be aware of potential dangers, he said.

"It's easy for a small child to get crushed between a fence and a cow," he said. "Kids have got to understand that animals outweigh people, are unpredictable and aren't always controllable."

He also recommends keeping farm chemicals and treated seeds well out of children's reach.To help children look out for each other, hazardous occupation training courses are available through local Cooperative Extension offices, which help make kids aware of safety issues about operating tractors and other machinery."With the right education, kids can be a great help on the farm and still be safe," Morgan said.

Sandy Alswager
IANR News

Fall grazing of alfalfa

Many growers find grazing alfalfa in the fall provides special flexibility and benefits:

1) Alfalfa makes an outstanding weaning pasture for spring calves.

2) Yearlings continue to gain weight rapidly on fall alfalfa even after summer grass starts to die off.

3) Cows can gain excellent condition before winter.

4) Ewes and lambs perform very well on fall alfalfa.

Fall grazing of alfalfa is not without problems, though. To protect livestock from bloat, fill them with hay before turning them onto alfalfa and provide them access to dry hay or corn stalks. Bloat protectants like poloxalene can be fed as blocks or mixed with grain. Also be careful not to damage alfalfa stands. Only graze when fields are dry and firm. Reserve a small sacrifice area to graze and for feeding when soils are wet to avoid damaging the entire field.

Bruce Anderson
Extension Forage Specialist

Alternative crops sprouting new options

(This article was originally published in the University of Nebraska Institute of Agriculture and Natural Resources magazine, Research Nebraska.)

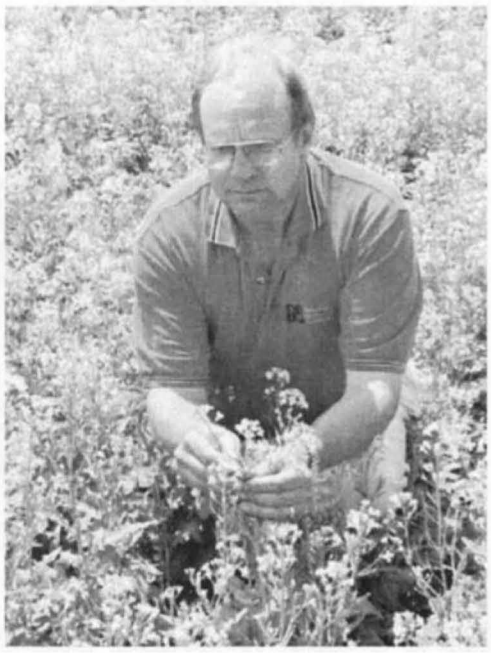
SCOTTSBLUFF, Neb. -- Early Panhandle settlers had high hopes of re-creating the lush fields of corn and wheat that already blanketed lower and wetter elevations to the east. Some even believed abundant rains would follow the plow onto the High Plains. Today, David Baltensperger takes a more realistic view. The University of Nebraska crop breeder works to identify, study and introduce new, higher-value crops for the Panhandle. He sees the region's semi-arid climate as both a challenge and an opportunity to build an agricultural economy based on a range of alternative crops.

Modern Panhandle mainstays such as sugar beets, sunflowers and proso millet, and emerging crops such as chicory began as ideas. Research by the University's Institute of Agriculture and Natural Resources scientists helped make them realities. There's no guarantee a crop that grows well elsewhere will thrive here. To find out, Panhandle Research and Extension Center researchers study everything from how different varieties perform to whether a potential newcomer fends off local insects and diseases, as well as their market potential. Findings help growers learn to plant, manage and harvest new crops.

"Some people wonder why we bother with testing so many types of crops," Baltensperger said. "I tell them that soybeans were once an alternative crop."

Alternative crops like turfgrass actually grow better in the Panhandle than in other areas because the region's low humidity restricts growth of turf diseases, he said.

Grasses for lawns and golf courses are among "leisure crops" that compete for consumer entertainment dollars. They represent a growing chunk of Panhandle alternative crop acres. Another leisure crop, bird seed -- including proso and foxtail millet, sunflower, sorghum and safflower -- is the region's third largest acreage crop behind wheat and corn.



Dave Baltensperger, a University of Nebraska crop breeder who specializes in alternative crops, inspects a test plot of canola.

Like sunflower, proso millet has grown into an important regional commodity. The Panhandle grows 200,000 acres of proso annually. IANR scientists developed varieties well-suited to the region and research laid the groundwork for expanded birdseed production.

The food industry is another potential market for new crops. Researchers are testing growing conditions and marketability of canola, sunflower and safflower for cooking or salad oils, and legumes such as chickpeas and garbanzo beans.

Another use for some alternative crops -- biofuels -- offers tremendous potential. Panhandle scientists are studying the potential of brown mustard and canola in making biodiesel, which could be blended with or one day replace petroleum-based fuels.

"There is a huge market for biodiesel that doesn't leave an excess of product," Baltensperger said. "It has the greatest potential for economic impact of any alternative crop."

Canola has performed well in the Panhandle, but before the promise of biodiesel, there was little or no local demand. Brown mustard's huge biodiesel potential has generated lots of interest, but researchers are still studying how best to grow it locally.

Like Baltensperger, Leon Kriesel of Kriesel Certified Seed in Cheyenne County is excited about the future of alternative crops, but cautions producers to be aware of the learning curve.

"Everybody is looking for the silver bullet crop," said Kriesel, whose company produces seed for crops such as winter wheat, proso millet, spring oats and barley. "There are a lot of exciting alternatives, but you need to develop the marketing first. It's purely economics."

Kriesel said IANR research is key to developing successful new crops.

"A lot of people don't see the workings of the university behind the eventual product," he said. "The university helps shoulder the risk (and) explore if these things work, if they are economically viable."

Baltensperger is presenting his research findings at a new crops conference in Australia this week. Contributing funds for this research were USDA's Sustainable Agriculture Research and Education (SARE), North Central Regional Canola programs, the Nebraska Department of Agriculture Value-Added Program and the Anna Elliott Fund.

David Ochsner
IANR News Service

Scout and plan for conservation measures

With field scouting winding down and harvest approaching, this is an excellent time to scout and begin planning for conservation practices that could be implemented or installed later this fall or next spring. These practices may include field borders, grassed waterways, water and sediment control basins, windbreaks, and/or conservation buffers.

The combine cab offers an excellent vantage point to note where channels have developed in the field from the concentration of runoff water. These rills generally develop in the same places each year. They get filled in by tillage in the spring, redevelop during the growing season, get bounced over by the combine during harvest, and the cycle is repeated the following year. Consider installing grassed waterways in these areas. Erosion will be reduced and the possibility of equipment damage lessened.

Grassed field borders can provide a convenient location for unloading combines into trucks or grain carts, or for turning planters and other equipment around. Controlling field traffic in this manner can greatly reduce the likelihood of developing a compaction problem within the field. Often field borders can be used to eliminate crop rows that would otherwise be planted up-and-down hill, further reducing soil erosion.

Water and sediment control basins generally are used where gully erosion is a problem and a grassed waterway cannot be installed or maintained because of large volumes of runoff water. They also are used when runoff and sediment from up-slope areas cannot be managed and damage to down-slope areas or other practices will occur. Basins must be cleaned periodically to remain effective.

Conservation buffers placed along the edges of streams or other water bodies can serve as a last line of defense for sediment and other pollutants that might enter the water. They are very effective at trapping sediment and enhance the infiltration of runoff water. Buffers also provide excellent habitat for pheasants, songbirds, and other wildlife and can enhance safety by keeping equipment away from the edge of the stream. When planted to trees, a buffer may provide income for future generations.

A grassed buffer strip is an effective conservation practice that can trap sediment, improve water quality, and provide wildlife habitat. *(Photo by Brett Hampton)*

A number of programs such as the Continuous Conservation Reserve Program are available to help landowners with the adoption and maintenance of conservation practices. Check with the local Natural Resources Conservation Service or Natural Resources District office to determine what programs are available for your land.

Conservation is a good investment, and this fall is an excellent time to begin or increase that investment.

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For more information, see . . .

- **Conservation Buffers,** a UNL Web site at *conservationbuffers.unl.edu/*
- The **USDA Natural Resources Conservation Service** site at *www.ne.nrcs.usda.gov/*
- The **Natural Resource District** Web site for your area, at *www.dnr.state.ne.us/databank/nrd/nrdweb.html*

Dry grain in layers to speed up process

Would you like to dry grain 20-35% faster with your in-bin drying setup? Try filling your bin in layers instead of all at once.

I recently completed a computer simulation looking at the time needed to dry grain using a drying bin. The simulation compared drying a full bin of grain to drying the same number of bushels in the same bin but drying the grain in layers instead of all at once. Scenarios included using natural air (60°F and 50% relative humidity), heating the air to 80°F, heating the air to 95°F, and heating the air to 110°F.

The moisture content of the grain was assumed to be 20% on the first day, but when filling the bin in layers, the initial moisture content of each succeeding layer was assumed to drop one- quarter percentage point per day because of the natural drying that occurs in the field. For the simulations where the bin was filled in layers, one-quarter of the bin was filled with each successive layer (4.5 feet per layer) making the grain 18 feet deep after the fourth layer. The computer calculated the time to bring each succeeding layer down to 15.5% moisture.

Note: In the real world, the grain continues to dry down if the fan is allowed to continue to run after the grain has reached the target moisture content. Drying continues until the grain reaches an equilibrium moisture content that is a function of the temperature and humidity of the air passing through the grain. The grain in the bottom of the bin will become over-dried by the time the grain in the top of the bin is at the desired moisture content.

Based on the temperature and humidity for the four scenarios, the corn at the bottom of the bin would approach 10.9% moisture with natural air drying, 7.5% when heated to 80°F, 5.6% when heated to 95°F and 3.7% when heated to 110°F.

If the grain was, in fact, dried until the top of the bin was at 15.5% moisture, actual drying times would be longer in all cases due to the time required for the air to remove the additional water from the over-dried grain in the lower portion of the bin. Since drying the whole bin in one filling requires longer drying times than drying in layers, more total water will be removed from the lower part of the bin. This results in even greater percentage differences between drying a full bin and drying in layers than is shown in the table.

Results of a simulation[1] comparing the time required to dry an 18-foot depth of grain in a bin by using various methods to dry either the whole bin or to dry it in layers.

Drying method	*Days to dry full bin*	*Total days to dry in layers*	*Days to dry individual layers*
Natural air drying	14.5	9.2	2.49, 2.31, 2.19, 2.17
Heated to 80°F	6.12	4.5	1.05, 1.07, 1.12, 1.24
Heated to 95°F	5.08	3.8	0.87,0.90, 0.95, 1.07
Heated to 110°F	3.74	2.9	0.64, 0.67, 0.72, 0.82

[1] Simulations were run assuming a Caldwell F24-10, 10.5 hp axial flow fan on a 27 foot diameter bin with a full mesh drying floor. Maximum grain depth, 18 feet. Total storage capacity 8,241 bushels.

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Events calendar

Information about these events is available in this and previous issues of *CropWatch* or from your local Cooperative Extension office.

September

- Forestry Field Day, September 25, Horning State Farm near Plattsmouth

October

- Land Application of Manure Workshop, October 7, Ohiowa
- Land Application of Manure Workshop, October 27, West Point

Don't forget to check **CropWatch** and **Nebraska AgNews** on the Web at *cropwatch.unl.edu* and **Market Journal** at *marketjournal.unl.edu.* Both Web sites offer email subscription services so you can keep up to date throughout the year.