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Stalk rot diseases increasing in corn; check fields and prioritize harvest accordingly

As the corn crop matures and dries down, be on the alert for stalk quality problems. Over the last two weeks stalk rot diseases have become prevalent in many counties due to a combination of the weather conditions and a significant increase in the development of gray leaf spot (Cercospora zeae-maydis) and Southern Rust (Puccinia polysora) in several counties. Leaf blights reduce the effective leaf area that provides carbohydrates to the developing kernels. As a result, the corn plant draws reserves from the stalk tissue. The mobilization of nutrients out of the stalk predisposes the plant to stalk rot diseases.

Fusarium, Diplodia (Stenocarpella), and anthracnose are the primary stalk rots observed to date, however weather conditions have been favorable for other stalk rot diseases including charcoal rot (Macrophomina) and Bipolaris stalk rot. The most effective management practice at this point in the season is to monitor fields and determine the level of stalk rot in the field. Randomly walk each field and test stalk strength of 50-100 plants by squeezing the stalk at the lower two internodes. If the stalk collapses between the thumb and forefinger of 25 or more plants, stalk rot disease has advanced to problem levels. These fields are at high risk to wind damage and should be harvested first to preclude lost yield from unharvestable ears.

(Continued on page 198)
Wheat insurance deadline Sept. 30

Wheat growers are reminded that the deadline to sign up for winter wheat crop insurance coverage in Nebraska is Sept 30. This is also the deadline to change coverage levels from last year or change the type of coverage.

Three types of wheat crop insurance are available in Nebraska. The Multi-Peril Crop Insurance (MPCI) and the Crop Revenue Coverage (CRC) each are available in 82 counties and the Group Revenue Coverage (GRP) is available in 33 counties in the state.

The base or planting time price for CRC is based on the average closing prices on the Kansas City Board of Trade for the July 2002 contract between August 15 and September 14. The average from Aug. 15 through September 10 is $3.35. The $3.35 price can be used to estimate the premium cost for CRC coverage and the revenue coverage the policy will provide.

Stalk rot

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Stalk rot diseases continue to cause problems for Nebraska’s producers. A re-examination of the factors responsible for the high incidences and severities of stalk rot over the last four years is warranted. Planting practices (e.g., minimum tillage, high planting densities, narrow row planting) are evolving and hybrids are being developed to place more energy into yield. This may require a novel management strategy to preclude increased and sustained losses to stalk rot diseases.

Additional information on stalk rot diseases in Nebraska can be found in the UNL Cooperative Extension NebGuide, Common Stalk Rot Diseases of Corn, G99-1385.

Doug Jose
Extension Ag Economist

The Risk Management Agency (RMA), the arm of the US Department of Agriculture that administers the crop insurance program, has set the MPCI price election at $3.15 per bushel. This is an increase from the $2.80 price set last year which means an increase in coverage but also an increase in premium cost for MPCI.

In the last few years the vast majority of wheat insurance coverage in Nebraska has shifted to revenue coverage. Of approximately 1,750,000 acres of wheat planted for all uses in 2000, 1,075,000 acres or about 60% of were covered by CRC, according to Jay Waechter, RMA risk management specialist. Another 381,000 acres were covered by multiperil insurance, Waechter said.

Gary Hall, Extension Educator in Phelps and Gosper counties: The last irrigation has been completed and much of the high moisture corn is being harvested. Soybeans are losing leaves quickly and harvest of early planted soybeans will begin soon. Stalk rot is showing up in corn fields and will need to be watched in case early harvest is needed.

Paul Hay, Extension Educator in Gage County: Chinch bug and greenbug pressures were greater this year than some producers realized. Some preharvest checks of grain sorghum fields are indicating greater than expected damage. Generally, crops in southeast Nebraska look quite good. Some scattered areas of hail and high winds have taken the edge off yields. The earliest planted no-till corn fields are beginning to be harvested, providing dryland yields in excess of 100 bushels per acre.

Doug Jose
Extension Ag Economist
Proper calibration is essential to accurate yield monitor 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 corrected yield at every location in the field. This geo-referenced data can be used to develop a yield map showing the 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 and estimated on a per acre basis.

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 checklist for yield monitor operation and calibration can be found at a Ohio State University web site at http://precisionag.osu.edu/library/ymonitor.html.

Unfortunately, many producers think that calibration consists of harvesting a truckload 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 truckloads, weighing them all as one load, 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. 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 the low flow rate calibration 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 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 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 actual flow rate of grain across the sensor.

When comparing the scale weight of a load 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. They should not be used to determine the exact yield of a field or portions of a field. 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.

Paul Jasa  
Extension Engineer
Utilize late season diagnostic tests to evaluate nitrogen status of corn

High nitrogen prices this spring stimulated many producers to re-evaluate their nitrogen management for corn. Many may have reduced their average nitrogen rates by 50 pounds or more. Now is a good time to ask what effect these changes had on corn and whether there were any yield reductions. Without conducting nitrogen rate studies, it’s difficult to answer this question definitively. Three procedures, however, can provide an indication of nitrogen uptake: stalk nitrate test, chlorophyll meter, and green leaf counts. Once corn leaves dry up, it is too late for the chlorophyll leaf meter and green leaf counts. Most corn in Nebraska is probably past the point of using these two tests, so this article will focus on stalk nitrate testing.

Iowa State University developed the corn stalk nitrate test, and its usefulness has been verified in other states. A full explanation of the test can be found in the Iowa State University Extension Publication PM-1584 published in September 2000, Cornstalk testing to evaluate nitrogen management, by A. M. Blackmer and A.P. Mallarino. (Available on the web at http://www.extension.iastate.edu/Publications/PM1584.pdf).

What does the test show?

The results of the corn stalk nitrate test indicate whether the corn was over fertilized during the season. Blackmer and Mallarino have calibrated the test to show low, optimal and excess stalk nitrate values (Table 1). Low values indicate nitrogen may have been deficient. Excess values indicate that there was more nitrogen than needed in the plant to produce grain. The scientific basis for this test is the fact that corn will continue to accumulate nitrogen past the level at which grain yield is increased. Since corn does not show visible symptoms of excess nitrogen, analysis of the stalk tissue can determine when this occurs. This test is probably best used for finding excess nitrogen since deficiencies can be spotted visually by leaf yellowing. This season if the test comes back in the optimum range, that indicates any reduction in nitrogen applied did not cause economic decreases in yield.

How to take the test?

Iowa state recommends taking the corn stalk samples any time between one and three weeks after black layer formation in 80% of the kernels. Newly published information indicates that the stalk test can be taken as early as when the milk line is one-fourth of the way down the kernel. To take the test, remove an 8-inch segment from 6 inches to 14 inches above the ground.

Remove the sheaths. Don’t take diseased stalks or stalks damaged by hail or insects. Take 15 stalks per sample, keep cool and send to the laboratory immediately. Samples

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Table 1. Interpretation of the test results

<table>
<thead>
<tr>
<th>Plant nitrogen status</th>
<th>Stalk nitrate (ppm)</th>
<th>Management suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0-250</td>
<td>Increase nitrogen</td>
</tr>
<tr>
<td>Marginal</td>
<td>250-700</td>
<td>Increase nitrogen</td>
</tr>
<tr>
<td>Optimal</td>
<td>700-2000</td>
<td>Yields are not limited by nitrogen stress</td>
</tr>
<tr>
<td>Excess</td>
<td>Greater than 2000</td>
<td>Plant nitrogen greater than needed</td>
</tr>
</tbody>
</table>
Nitrogen testing (Continued from page 200)

should be sent in paper wrapping and not plastic since plastic wrapped samples may mold. Have the samples analyzed for nitrates.

A recent article (Fox et al., July 2001) in the Agronomy Journal compared the stalk test, late season chlorophyll meter, and green leaf count techniques. (At right, read an abstract of the article, which is available on the Web at http://agron.scijournals.org/cgi/content/abstract/93/3/590.)

Based on this article, I have summarized the results of their analysis in Table 2. The authors used experimental data to determine the error rate of using different critical levels to interpret the test results. Because the tests were conducted on corn grown in replicated experiments, they could determine if the diagnostic test level accurately matched the plant response. Their criteria for whether the test was valid was whether the yield was at 93% of maximum yield.

For example, with the chlorophyll readings taken at one-fourth milk line they used a critical value meter reading of 52. They derived the 52 reading from their previous research. Once the criteria was set they determined if the treatment correctly predicted sufficient nitrogen or not. They divided the errors into two groups: predictions that the plant was nitrogen deficient (Continued on page 202)

Abstract: Comparison of late-season diagnostic tests for predicting nitrogen status of corn

By Richard H. Fox, William P. Piekielek and Kirsten E. Macneal, Department of Agronomy, 116 ASI Building, Pennsylvania State University, University Park, Pennsylvania 16802

We compared six late-season diagnostic tests for determining nitrogen adequacy in corn (Zea mays L.) in a three-year study in Pennsylvania. The six tests were: (i) the NO-3–N concentration of stalk sections at black layer; (ii) the NO-3–N concentration of stalk sections at the one-fourth milk line growth stage (MLGS), which allows corn grown for silage to be tested; (iii) the chlorophyll meter (CM) test at the one-fourth MLGS; (iv) the relative CM test (normalized values) at the one-fourth MLGS; (v) a visual test based on the number of green leaves below and including the ear leaf at the one-fourth MLGS; and (vi) a relative visual test (normalized values at the one-fourth MLGS).

We found that with a critical level of 250 mg kg−1 NO-3–N, the stalk NO-3 test separated nitrogen-sufficient from nitrogen-deficient sites with approximately 93% accuracy when sampling was done at either the one-fourth MLGS or within several weeks after black-layer formation. It appears that the 250 mg kg−1 NO-3–N critical level can be used to accurately predict nitrogen adequacy for any sampling time between the one-fourth MLGS and a few weeks after black-layer formation.

When drought-stressed fields were excluded or the CM readings normalized with a high-N reference plot in the field, the accuracy of the CM test at the one-fourth MLGS was approximately 92%. The visual test at the one-fourth MLGS was an accurate predictor of corn N status only when visual readings were normalized with a high-N reference plot. These results demonstrate that there are several late-season nitrogen tests that are suitable for making relatively accurate assessments of nitrogen sufficiency for corn silage and grain yields.

Abstract reprinted with permission from the July 2001 Agronomy Journal (93:590-597), published by the American Society of Agronomy.

Table 2. Summary of diagnostic techniques, critical values and error rates. (after Fox et al., 2001. Agronomy Journal 93:590-597)

<table>
<thead>
<tr>
<th>Samples in database</th>
<th>Diagnostic Technique</th>
<th>Critical value</th>
<th>Falsely predict N deficient</th>
<th>Falsely predict N sufficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>702</td>
<td>Chlorophyll meter</td>
<td>52</td>
<td>13.4</td>
<td>1.7</td>
</tr>
<tr>
<td>702</td>
<td>1/4 Milkline growth stage</td>
<td>48</td>
<td>2.7</td>
<td>4.6</td>
</tr>
<tr>
<td>209</td>
<td>Stalk nitrates at black layer</td>
<td>250 ppm</td>
<td>5.3</td>
<td>1.9</td>
</tr>
<tr>
<td>209</td>
<td></td>
<td>700 ppm</td>
<td>12.1</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Nitrogen testing (Continued from page 201)

when it wasn't or predictions that the plant had adequate nitrogen when it was deficient. Using the chlorophyl meter reading to determine if the plant had adequate nitrogen wrongly predicted the crop was deficient 13.4% of the time. The plant actually had adequate nitrogen even though the meter suggested it was low. Using the same meter reading criteria, 1.7% of the time the corn falsely suggested the plant had adequate nitrogen when it was low.

When the authors lowered the criteria from 52 to 48 the total error rate actually decreased from 15.1% to 7.3% because the percent the meter falsely predicted deficiency decreased from 13.4% to 2.7%. There was not a corresponding increase in the false prediction of adequate nitrogen.

The data on the stalk nitrates also shows the change of error rates when the criteria for predicting deficiency changes. The Fox et al. data indicates that using 250 ppm would keep prediction errors to 5.7%. Using the 700 ppm critical value used by Iowa had a 0% error rate for falsely predicting nitrogen sufficiency.

The Fox et al. data provide more evidence that corn stalk nitrate tests are a useful tool in nitrogen management. They are best used to determine if adequate nitrogen was available. They would be especially useful in fields with manure history where the producer needs reassurance that reducing fertilizer nitrogen will not affect yields. This year they may also help producers determine if reducing nitrogen rates decreased yields.

Charles Shapiro
Extension Soils Specialist
Haskell Ag Lab, Northeast REC

Did you change your nitrogen plan this year?

I would be interested in hearing individual farmer experiences with nitrogen this spring. I am interested in knowing:

1) Whether you changed your applied nitrogen rates this year, and if so, by how much?
2) Whether you think this change will affect yield or profit?
3) How you determined how much to change your nitrogen rates, if you did; and
4) What was the price of the nitrogen you applied?

Please email your stories to me at cshapiro@unl.edu

Charles Shapiro
Extension Soils Specialist
Haskell Ag Lab, Northeast REC

Take breaks and think safety first at harvest

The smell of diesel and the roar of combine engines soon will be in the air as another harvest begins.

Harvest is a perennially hectic season, but extraordinary risks shouldn't be taken to get a job done faster, an Institute of Agriculture and Natural Resources specialist said. Amid the rush, farmers should invest time on safety precautions.

Agriculture is the second most dangerous industry in the United States, with 770 deaths and 150,000 disabling injuries reported in 1999. In Nebraska in 2000 there were 20 farm fatalities and already in 2001 there have been 13.

Farmers work longer hours during harvest. This means they're working after dark with limited visibility and often don't get enough rest. If farmers aren't careful, either or both could lead to injury.

"At night, farmers work with machines and can't see moving belts and rotating shafts. With low visibility you need to be cautious of what's around you," said David Morgan, University of Nebraska safety engineer.

Fatigue takes both a psychological and physical toll on farmers, he said. It's important for farmers to take breaks throughout the day to reduce fatigue. Farmers should take 5 to 10 minute breaks every hour or longer 15- to 20-minute mid-morning and mid-afternoon breaks.

Handling grain also can be a health hazard. Whether moving grain or working in the grain bin, there's always a danger of suffocation or respiratory problems.

Farmers should wear filter masks if they're sensitive to organic dusts stirred up by handling grain or silage farming, Morgan said.

Check all equipment, including tire pressure and brakes, before going into the field.

Morgan recommended cleaning tractor and combine cab glass so drivers can see clearly what is happening and who is around them.

"Make sure warning lights are functional so motorists can see the equipment when you're on the road when visibility is reduced," Morgan said.

Another common cause of injury during harvest season is falling off farm equipment.

For more information, visit the National Safety Council's web site at http://nsc.org/farmsafe.htm
Provide long-term protection

Most stored grain requires aeration

Farmers store grain on the farm following harvest for a number of reasons. Many farmers find it more convenient to store their production until the press of harvest is past when they will have more time to haul the grain to market and to avoid long lines at the elevator. Farmers often can add value by drying their the grain on the farm prior to delivery. Typically, local basis (the reduction in local market price compared to the futures market price) is greatest at harvest due to limited storage space and the labor crunch at the elevator at harvest time. Following harvest, the local basis usually (but not always) improves, hopefully providing a net return to the farmer above his storage costs and interest expense.

Storing grain requires informed and active management. Improper storage can result in a lower quality product, loss of grain mass, and sometimes spoiled or moldy grain. The two most important factors in grain storage are the grain’s temperature and moisture content. A farmer has some control over temperature with aeration and careful attention. With higher airflow rates, moisture also can be removed.

Why aerate?

If corn goes into storage below 15% moisture and less than 50°F, it can be held for several months without aeration. Most years in eastern Nebraska, it is not possible to delay harvest until grain meets these criteria and further action will be needed.

Above the threshold temperature and moisture content, stored grain will respire, (carbohydrates in the grain combine with oxygen from the air releasing carbon dioxide, water, and heat). When grain respires, dry matter is lost. This dry matter loss is analogous to burning the grain in a fire (which also produces carbon dioxide, water .... and heat). Left unchecked, a runaway reaction can occur in a mass of wet grain. The heat produced by the respiration process warms the grain mass, which in turn results in higher respiration rates which causes greater dry matter loss and more heat production to continue the cycle.

Storage bin fans should run continuously rain or shine from when the grain is added until it reaches the appropriate temperature -- approximately 50°F.

Known as storage molds, various fungi species can grow on stored grain if it is above the threshold moisture content and temperature. Like all aerobic organisms, storage molds also respire (they consume carbohydrates and oxygen and release carbon dioxide, water, and heat). Molds also lower the grain quality by virtue of their presence in the grain by adding offensive odor, taste, and dust. Some mold species also produce toxins which can be harmful if consumed in sufficient quantity. The best way to prevent loss of dry matter and a reduction in grain condition from molds is to store only dry grain (below 15% moisture). Alternatively, one can use aeration to keep the grain mass below 50°F and extend the storage life by reducing mold activity.

In Nebraska cool air temperatures usually follow harvest. Given sufficient airflow rates and cool outside air temperatures, aeration can be used to cool grain in the bin. Depending on the airflow rate, one should expect a cooling front to take many days to a few weeks to move all the way through a bin of grain. A fan must run continuously until the grain is cooled to the proper temperature.

Experts discuss the shelf-life of corn as the point at which one-half of one percent of the dry matter has been lost. Corn at 16% moisture that went into storage at 50°F, followed by careful monitoring and periodic aeration to maintain a constant 50°F in the grain, will have a shelf life of about 186 days (six months). The shelf life drops dramatically at higher moisture contents. Corn at 18% moisture and a constant 50°F will have a shelf life of 128 days (four months). At 20% moisture and 50°F, the shelf life is only 63 days (two months). A rule of thumb is that shelf life drops about one month for every point of moisture above 16% when the grain is maintained at 50°F with aeration.

Higher temperatures reduce shelf life even more dramatically. At any given moisture content, the "shelf life" is less than half as long for every 10°F increase in temperature.

Further information on grain aeration and drying is available at: http://lancaster.unl.edu/ag/crops/storage.htm.

(Continued on page 204)
Southern Nebraska may see two 'new' pests

In part due to mild winters the past few years, we have seen some new insects entering Nebraska from the south. Two of these include the southwestern corn borer and the soybean stem borer. You may see them in some counties bordering Kansas this year.

Kansas State University entomologists report that southwestern corn borers were seen in Jewell County Kansas in 2000. Jewell County is just south of Superior, Nebraska. Historically, southwestern corn borer have rarely been reported in Nebraska; however there were reports of the insect being found at low levels this summer in south central Nebraska. Winter temperatures are thought to influence their northern limits.

Southwestern corn borers, *Diatraea grandiosella*, belong to the same insect family as European corn borer, and share many similarities in their life cycle. In Kansas and Nebraska there are two generations a year, with timing similar to European corn borers. Eggs are laid in masses and have an appearance similar to that of the European corn borer (flattened and overlapping like fish scales). One difference is that as southwestern corn borer eggs develop, three orange-reddish lines develop across each egg. Larvae are white with large raised black spots on each segment. They are 1.0 - 1.25 inches long at maturity. The second generation of southwestern corn borer is most damaging, both from stalk boring activity and because it girdles the base of the corn stalk in preparation for overwintering. This weakens the stalk and makes stalk breakage more likely. KSU entomologists recommend applying insecticides when 20% to 25% of the corn plants are infested with eggs or newly hatched larvae. Southwestern corn borer may survive in sorghum as well as corn.

Kansas State University entomologists also report increasing populations of the soybean stem borer, *Dectes texana texana*, in north central Kansas the last few years. In 1999 high populations were reported in Republic County Kansas, south of Thayer County, Nebraska. In the fall of 2000 we confirmed the presence of soybean stem borer damaging a soybean field near Chester (just north of the Kansas border on Highway 81).

The soybean stem borer is a member of the beetle family Cerambycidae (long-horned beetles). It is a native insect which feeds on wild hosts including cocklebur, sunflowers, and common and giant ragweed, as well as soybeans. The adults are elongate, gray beetles, about 0.25-0.40 inch long, with the antennae longer than the body. Adults lay eggs in the upper leaf petioles of soybean during July and August. Newly hatched larvae feed in the petiole pith initially but soon tunnel to the main stem. The trifoliate leaf where

(Continued on page 205)
Plants may become poisonous after freeze

When plants freeze, changes occur in their metabolism and composition. Sorghum-related plants, like cane, sudangrass, and shattercane, can be highly toxic to grazing cattle for a few days after frost. Freezing breaks plant cell membranes. This breakage allows the chemicals that form prussic acid to mix together and release this poisonous compound rapidly. Livestock eating frozen sorghum can get a sudden, high dose of prussic acid and may die. Fortunately, prussic acid soon turns into a gas and disappears into the air. Wait three to five days after a freeze before grazing sorghums.

Freezing slows down metabolism in all plants. Alfalfa reacts in two ways. Nitrate levels can increase, but rarely to hazardous levels. Freezing also causes alfalfa to be more likely to cause bloat for a few days after the frost. Then, several days later after plants begin to wilt or grow again, alfalfa becomes less likely to cause bloat. Waiting to graze alfalfa until well after a hard freeze is a good, safe management practice.

Bruce Anderson
Extension Forage Specialist

Alfalfa cutting caution

As noted in the last issue, harvesting alfalfa during winterization is risky. Only when odds are in your favor, is it likely to be worth the gamble. The odds are best if this is only your third cutting or less this year. If it’s your fourth cutting, you probably will have slightly lower yields next spring by cutting now, and if it’s your fifth cutting, you are almost certain to lose yield and probably some stand. Odds improve if stands are young and contain winterhardy varieties that resist most diseases.

‘New’ insects (Continued from page 204)

The egg hatched and the larva began feeding will wilt and die. Larvae tunnel in the stalk until they complete their development. Soybean stem borer larvae are slender, legless, and creamy white in color, reaching 0.60 inch at maturity. Larvae overwinter in the stalk, pupate in early summer, and adults emerge from June to September. As they finish feeding, last stage larvae move down to the bottom of the stem, and girdle the inside of the stem 2-4.5 inches above the soil level. This predisposes the soybean plant to break at the girdled point during windy periods. Up to 10% yield reduction has been reported from the effects of larval tunneling but the greatest yield losses occur due to lodging. The borer girdles earlier-maturing varieties more severely and lodging is most severe on earlier-planted soybeans.

Insecticides are not recommended for control; they are ineffective for control of overwintering larvae. Adults can be controlled with foliar sprays, but because of their extended period of emergence treatment is not feasible. Cultural practices suggested to reduce losses include harvest of infested fields as soon as maturity is reached, crop rotation, and control of weed hosts.

Additional information on both of these pests is available from the Kansas State University web site at

- **Southwestern corn borer:** http://www.oznet.ksu.edu/library/entml1/SWCB.pdf
- **Soybean stem borer:** http://www.oznet.ksu.edu/dp_entm/extension/Current/soybstbr.html

Bob Wright
Extension entomologist
South Central REC

Aeration

(Continued from page 203)

Airflow rates as low as 0.1 cubic foot per minute per bushel (cfm/bu) have been successfully used to hold grain that is at or less than 16% moisture during the cooler part of the year. Greater airflow rates (0.33 to 0.5 cfm/bu) are recommended to hold grain that is placed into storage at moisture contents above 17% or grain that goes into storage above 70°F. The fractional cfm/bu airflow rates that are used for aeration can only be expected to keep grain from heating and to very slowly cool grain when air temperatures that are cooler than the grain mass. Much higher airflow rates (2.0 cfm/bu or higher) are needed to remove appreciable moisture from the grain. For more information on drying grain, refer to NebGuide G85-760, Natural Air Corn Drying.

Further information, publications and resources on grain aeration and drying are available on the Lancaster County Extension website on the Grain Storage page at: http://lancaster.unl.edu/ag/crops/storage.htm.

Tom Dorn, Extension Educator,
Lancaster County
Consider improvements for next year

Assessing fields from the combine

Touring your fields from the combine seat during harvest can provide a good opportunity for identifying problem areas which you may be able to rectify yet this fall.

Uneven stands may be caused by a variety of factors. While it may be difficult to determine at harvest exactly what caused uneven stands, there may be some clues. For example areas with smaller diameter stalks and longer internode distances may indicate a shallow planting depth where good moisture wasn’t available for immediate emergence. With corn it’s good for all the plants in a field to emerge within one to two days to provide for equal competition.

Plants emerging just four to five days later than other plants may act more like weeds, using resources, but contributing little to yield.

If yields are less than expected in some “hot spots”, take this opportunity to determine possible causes and look for amendments or practices to change for next year. First try to identify or mark the location of the problem. Yield monitors and GPS systems can make site identification easy. If these tools aren’t readily available, keep a clipboard handy in the combine to make notes. Mark field ends with various colored flags or use farm landmarks to reference the site location.

After harvest, return to assess the situation. If yields were lower than expected, test the soil for organic matter, nutrients, pH and compaction. Try to determine the extent of the variance between that area and the rest of the field and whether it’s economical to address the problem. Low areas may need to be drained or amendments may need to be added to targeted areas. If organic matter is low, soil texture is coarse and/or the pH is high, herbicide rates may need to be reduced in the identified area next year to avoid crop injury.

Similarly, if yields are higher than expected in specific areas, try to determine what’s contributing to the increase and whether it’s cost efficient to bring the rest of the field up to that level.

Some identified problems can be addressed in the fall; however there’s no reason for fall tillage except to break up compaction.

Especially with corn, if doing fall field work such as cutting stalks, take steps to limit winter erosion. For example, leave six to eight rows of stalks standing at intermittent intervals to slow the wind and trap snow.

The combine seat also provides a vantage point for a season end evaluation of weed management. Field notes and maps of weed infestations made during harvest can be used in planning next year’s weed management program. Every field is different so be sure to make a map with notes rather than relying solely on your memory.

Locate large patches of perennial weeds such as Canadian thistle and hemp dogbane, for example, and if time permits, treat this fall or prepare to treat in the spring.

A weed patch present at harvest may be telling you something that is not so obvious. Normally we may think that weed patches indicate a need for “stepping up” our weed management program a notch or two; however the problem may lie deeper than meets the eye. Weed patches may result when the crop canopy is thin in an area. A thin canopy could be the result of a reduced crop stand resulting from improper planter adjustment/operation or low crop vigor due to seed quality, low soil nutrients, or other soil related problems. Correcting these fundamental problems will increase crop yields and help with weed control.

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Check soybean nodulation for future use

Let’s look to the future, say Spring 2003. You plan to plan to plant soybeans in a field that had soybeans back in 2001. You know that soybean nitrogen fixation and effective inoculation are important aspects of the soybean and corn production systems. You know that University and industry agronomists recommend inoculating a field if it has never had soybeans or if it has not had a nodulated soybean crop in the past five years. So, one of the key questions you should ask yourself is whether the field had a nodulated crop of soybeans previously. You know it had soybeans in 2001, but if you didn’t check for nodules you really can’t answer the question.

Now, back to 2001 . . . . . . This is a good time to dig plants and check for nodules so you can easily answer questions for future soybean plantings. A uniform crop canopy and color in your soybean fields now may simply signify high residual nitrogen and not necessarily whether the crop was well-nodulated. Get out the shovels and dig up plants. Carefully shake soil from the roots and inspect the tap root and lateral roots for nodules. Record your observations on your field maps or field reports. This will excellent information for you next time you intend to plant soybeans.

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