

# agKnowledge Newsletter

The lay of the land from a trusted source.

## Current News and Updates

Well, it seems like just yesterday we were planting this crop and now we are planning for harvest. The key message as we begin harvest is: STOP, THINK, and SAFETY FIRST. The wide ranging lack of moisture in conjunction with high temperatures during grain fill, may have had a negative impact on grain quality and stalk integrity, so walk your fields and get an idea on harvest priority. This year, grain drying will almost certainly be a necessity, with the late planting and the variability we see in almost every field. This is also a great time of year to begin to prepare for next year, noting what fields have issues with weeds, diseases, or insects. With this knowledge, you can begin the process of planning your herbicide program, crop rotation program, and corn and soybean product selection. Also, in this newsletter you will see a message on IFS—read the article to find out what that acronym means. In closing, take your time this fall, keep your wits about you, and keep an eye on those around you to help keep everyone safe and sound.

## Scouting Your Fields

In preparation for harvest, scout corn and soybean fields to identify issues that may complicate harvest and to help make management decisions for next year.

**Scouting for Diseases.** Scout for corn stalk rots and lodging potential to help determine a harvest plan. Start 40 to 50 days after pollination and begin in fields that may be at a higher risk for weakened stalks. Often these are fields where plants were able to produce a good ear, but have experienced stress during the grain filling stages. In addition to drought, foliar diseases and nitrogen deficiency may compromise plant photosynthetic ability and promote cannibalization of stalk tissues. Stalks that are already broken or lodged are easy to identify, but some stalks that appear healthy may be compromised and ready to go down during the next big storm. When scouting for stalk rot, begin by first looking for visible symptoms such as discoloration of rind tissue and early death (Figure 1). To test stalk firmness, pinch the lower internodes between thumb and forefinger. Healthy stalks are firm and cannot be compressed. Stalks that feel soft and can be compressed are rotted and likely to lodge. Stalk integrity can also be checked using the push method in which plants are pushed 30° (or 6 to 8 inches) from vertical.<sup>1,2</sup> If plants fail to return to their upright position or break between the ear and the lowest node, then stalks are likely rotted. Select at least 100 plants randomly located throughout the field to test. If more than 10 to 15% of the stalks are rotted, then that field has a higher risk of lodging problems. Different corn products and fields with different management practices should be scouted separately.



Figure 1. A) Comparison of anthracnose infected stalk on left with healthy stalk on right; B) Comparison of stalk infected with Fusarium on right with healthy stalk on left.

Corn fields should also be scouted for foliar diseases like Goss's wilt. In the field, symptoms of Goss's wilt can be confused with symptoms of other diseases such as Stewart's wilt and northern corn leaf blight. Nitrogen deficiency and abiotic disorders such as heat stress and sun scalding may also cause similar foliar symptoms. Leaf freckles are the most distinctive symptom that

Continued on p 2



ISSUE **1308**

**Minnesota and Wisconsin**

### What's in This Issue

- Current News and Updates | 1
- Scouting Your Fields | 1
- Harvest Equipment Safety | 2
- Field Drydown vs. Drydown Costs | 3
- Impact of Late-Season Drought | 3
- Plan Ahead for FieldScripts® | 4

[AsgrowandDEKALB.com](http://AsgrowandDEKALB.com)

Please contact your local agronomist for more information



## Scouting Your Fields (cont. from p 1)

can be observed in the field to help differentiate Goss's wilt from other causes of leaf necrosis (Figure 2).

Scout soybean fields for diseases such as white mold (WM), sudden death syndrome (SDS), and brown stem rot (BSR). Fungicide sprays to control WM are not effective after the R4 growth stage, but noting where WM exists can help in making management decisions the next time that soybeans are planted in the field. Foliar symptoms of SDS and BSR are very similar. Make sure to look at stem pith tissues to help determine which disease is present. When in doubt, send samples to a plant diagnostic clinic. Contact your diagnostic clinic for information about collecting and submitting plant disease samples. Proper disease identification is important for determining the correct management tactics and selecting soybean products that are resistant or tolerant to the disease issues in your fields.

**Scouting for Insects.** Weekly scouting for corn rootworm (CRW) beetles should be coming to an end, but plan to continue scouting until beetle activity stops.<sup>3</sup> Remember to leave 3 to 4 plants between each sampled plant so as not to disturb the beetles. Scouting for adult beetles is particularly important to determine the potential for CRW larval damage if corn is going to be planted in the field next year. This information can help with evaluating insect control plans and with corn product selection for next year. Western bean cutworm injury to ears can be quite noticeable prior to harvest. If exit holes are discovered in the ear shaft, consider a Genuity® SmartStax® corn product next year in that field and surrounding fields as well.

**Scouting for Weeds.** This is a good time to evaluate your current corn and soybean weed management plan and make



Figure 2. Goss's wilt freckles under normal light conditions (left). Freckles as they appear when the sun serves as a source of backlighting (right). Backlighting is a useful way to differentiate Goss's freckles from other things, such as saprophytic fungi, that may cause dark specks on leaves.

sure that it is still effective against the weed profile in your fields. Note if weeds were not adequately controlled by your current herbicide program or if different weed species are present than previously identified. Identify the predominant weed species and use this information to develop a comprehensive herbicide plan for the spring.

This is also a good time to start thinking about scouting for winter annuals, which usually germinate in the late summer to early winter. Winter annual weeds tend to be easier to control in early fall when they are still actively growing. A fall herbicide application can also effectively control several perennial weeds such as Canada thistle. The earlier you can identify weed species, the more time you have to plan a fall herbicide application.

Sources: <sup>1</sup> Jackson-Ziems, T. 2012. Stalk rot diseases creating harvest problems in corn. University of Nebraska CropWatch. <http://cropwatch.unl.edu> (verified 8/29/13); <sup>2</sup> Doll, J. et al. 1998. Corn crop scouting manual. A3547. University of Wisconsin Extension; <sup>3</sup> Wright, B. 2009. Use corn rootworm scouting numbers as basis for 2010 production decisions. University of Nebraska CropWatch. <http://cropwatch.unl.edu> (verified 8/29/13); Smith, D. Late season soybean disease update—8/27/13. University of Wisconsin. <http://ipcm.wisc.edu> (verified 8/30/13); Menalled, F. and Mangold, J. 2011. Get ready for fall weed control. Montana State University. <http://www.msuxextension.org> (verified 8/30/13).

## Harvest Equipment Safety

Here are some safety tips to which all farm workers should adhere:

- When transporting machinery on roads, have these items in place: a spotter, reflectors from the Department of Transportation, a slow moving vehicle sign, and flags on items that stick out.
- During harvest season wear high visibility clothing to be easily spotted.
- Thoroughly inspect and test farm equipment before use.
- Decrease fatigue by shutting machinery off and walking around at least once every hour.
- Stay hydrated to maintain awareness.

Most accidents and injuries that involve machinery occur while the machinery is in operation. Idle machinery can also be dangerous. It is important to be incredibly cautious when

doing a pre-harvest inspection, making sure that basic safety checks are in place. Here are some important steps to follow during machinery maintenance:

- Terminate all power sources prior to working on machinery.
- Make sure machinery is turned off and in park or neutral with the parking brake engaged before working on it.
- A tractor with a front loader or other accessory that can be raised may need to be lowered to keep it from dropping unexpectedly and to ensure machine balance.
- Wait a few minutes after turning off farm equipment to make sure all parts have completely stopped moving before working on it.

Sources: Hanna, M. and C. Schwab. 2013. Harvest safety yields big dividends. Iowa State University. [www.extension.iastate.edu](http://www.extension.iastate.edu) (verified 6/21/13); OSHA. Farm Safety. 2005. OSHA fact sheet. [www.osha.gov](http://www.osha.gov) (verified 6/21/13).

## Field Drydown vs. Drydown Costs

High moisture grain can be a concern in late or replanted corn fields. Late-planted corn tends to mature later during the shorter days and cooler temperatures of early fall and therefore drydown can take longer. Deciding whether to let corn dry in the field or dry after harvest depends on many factors including the rate of field drying, potential yield loss in the field, and propane costs.

**Rate of Field Drydown.** It takes 15 to 20 growing degree days (GDD) to reduce corn moisture by approximately 1% from 35 to 25%. It takes 20 to 25 GDD per point of moisture to dry grain from 25 to 20%. Drydown rates slow from 0.8 percentage points per August day to about 0.4 percentage points per September day.<sup>1</sup> Going from moisture at black layer (32 to 35%) to ideal harvest moistures between 24 to 25% may take two to four weeks. On any given day, drydown is affected by temperature, humidity, sunshine, or rain conditions. For instance, drydown could be as much as 1.0 percent on warm, sunny, windy, and dry days or zero to 0.3 percentage points on cool, cloudy, rainy days.<sup>2</sup> If September weather is “normal” or follows the current weather patterns, a four to five week drydown period may be needed before corn reaches a harvestable moisture. Research from the University of Wisconsin has shown that corn does not lose much moisture past the end of October.<sup>3</sup>

**Potential Yield Loss in Field.** Yield loss during an extended period of field drying can be due to many factors including lodging, disease, and wildlife damage. Fields where planting

was delayed due to wet weather may still have been planted when soils were wet. This can lead to issues with compaction, restricted root growth, and lodging. If ear rots are present, and depending on the type of ear rot, consider that mycotoxins may continue to develop in field conditions.

**Cost of Drying Artificially.** The cost of drying grain after harvest depends on your propane costs and whether drying will occur on-farm or through a grain elevator. To figure a rough estimate of on-farm drying costs, multiply propane costs by 0.02 as in the example below<sup>4</sup>:

corn moisture = 25%; propane costs = \$2.00/gal

cost to dry to 15% =  $(0.02 \times \$2.00 \times 10 \text{ points}) = \$0.40/\text{bushel}$

**Hidden Costs.** These costs center around the shift in workload from fall to spring. If corn left to dry in the field this fall, then management practices such as tillage and fertilizer applications may be forced to the spring. An increase in springtime workload may not matter if weather conditions are favorable. However, if weather conditions are unfavorable, then planting may be delayed, which can compromise yield potential.

Sources: <sup>1</sup> Nielsen, R.L. 2011. Field drydown of mature corn grain. Purdue University. [www.agry.purdue.edu](http://www.agry.purdue.edu) (verified 8/22/2013); <sup>2</sup> Elmore, R. and L. Abendroth. 2007. How fast can corn dry down? Iowa State University. [www.agronext.iastate.edu](http://www.agronext.iastate.edu) (verified 8/22/2013); <sup>3</sup> Rankin, M. Corn dry down rates in late fall and winter. University of Wisconsin Extension. <http://www.uwex.edu> (verified 8/29/13); <sup>4</sup> Ward, B. 2011. Dry corn in the field or in the grain dryer. C.O.R.N. Newsletter. The Ohio State University. <http://com.osu.edu> (Verified 8/29/13).

## Impact of Late-Season Drought

Late-season stress in corn, such as from drought, reduces photosynthetic rates. This can lead to weakened stalks and reduced grain quality.

**Stalk Integrity.** During grain fill, the photosynthates produced by the corn plant during photosynthesis are targeted for developing kernels. This takes priority over maintaining other plants tissues such as leaves and stalks. When photosynthetic rates are reduced due to stress, plants are unable to produce enough photosynthates to meet the demand for grain fill and instead remobilize stored carbohydrates from stalk and leaf tissue to the developing kernels. This is often referred to as cannibalization and can cause stalks to become physically weaker and increases the susceptibility of stalks to infection by stalk and root rotting pathogens.

**Grain Quality.** Drought stress that occurs during grain-filling stages can reduce yield potential 2.5 to 5.8% per day of stress.<sup>1</sup> Drought stress that occurs during the blister and milk stages of kernel development can lead to aborted kernels. Tip dieback occurs when there is poor kernel development on the ear tip. These kernels are the last to be fertilized and

are most susceptible to abortion. Aborted kernels may be dried up and are often light yellow in color.

Drought conditions that continue through the dough and dent stages can increase the risk of premature kernel black layer formation and lead to decreased kernel test weight. Early senescence and premature death of leaf tissue brought on by drought conditions can result in decreased yield potential because of the decrease in photosynthesis. Although stored carbohydrates are remobilized to the developing ears, yield potential will still likely be affected. Once black layer occurs, the remobilization of stored carbohydrates stops. If the entire plant is killed before black layer would normally occur, then remobilization of carbohydrates stops earlier than normal. This results in incomplete grain fill and lightweight, chaffy, grain. Affected ears tend to be lightweight with noticeable spaces between shrunken kernels. Grain moisture levels greater than 35% are also likely, which may require a longer field drydown period before harvest.<sup>1</sup>

Sources: <sup>1</sup> Lauer, J. 2007. How do you manage a corn crop after stress? Agronomy Advice. University of Wisconsin. <http://com.agronomy.wisc.edu> (verified 8/28/2013); Nielsen, R.L. 2013. Stress during grainfill: a harbinger of stalk health problems. Corny News Network. Purdue University. <http://www.agry.purdue.edu> (verified 8/28/2013); Mueller, D. and Pope, R. 2009. Corn field guide. Iowa State University Extension. <http://www.agronext.iastate.edu> (verified 8/27/13).




**Online Subscription** Want to receive local, up-to-date agronomic information from your local Agronomist? If so, scan the code to the left or visit: <http://asgrowanddekalb.com/signup> and sign up to receive Agronomic Alert and Spotlight publications and text updates along with your agKnowledge newsletter. Your email address will not be sold or used for other purposes.

## Plan Ahead for FieldScripts®

Integrated Farming Systems (IFS) is focused on getting more from every acre by integrating Monsanto's expertise in seed science, field science, data analysis, and precision equipment to develop solutions specific for individual field conditions. FieldScripts® is a variable rate seeding prescription, which will identify the best seed match for each field, and the best planting rate for that specific seed, in each yield-management zone. Monsanto will be introducing this new service in phases across the US beginning in 2014. Currently it is available in the Ground Breakers® on-farm trial program in Minnesota. To

participate, growers will need a minimum of 2 years of raw corn/soybean yield data and soil test data within the last 3 years on a 3-acre grid. Contact your local agronomist, your FieldScripts Certified Dealer, or retailer to see when FieldScripts may be available in your area.



**Insect Resistance Management**  
*Planting Refuges, Preserving Technology*

Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology/Stewardship Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements.

Monsanto Company is a member of Excellence Through Stewardship® (ETS). Monsanto products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Monsanto's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. This product has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Biotechnology Industry Organization. B.t. products may not yet be registered in all states. Check with your Monsanto representative for the registration status in your state. Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup Ready® crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup® brand agricultural herbicides. Roundup® brand agricultural herbicides will kill crops that are not tolerant to glyphosate. Asgrow and the A Design®, Asgrow®, DEKALB and Design®, DEKALB®, FieldScripts®, Genuity®, Ground Breakers®, Integrated Farming Systems & Design™, Roundup Ready 2 Technology and Design®, Roundup Ready®, Roundup® and SmartStax® are trademarks of Monsanto Technology LLC. Leaf Design® is a registered trademark of Monsanto Company. LibertyLink and the Water Droplet Design® is a registered trademark of Bayer. Herculex® is a registered trademark of Dow AgroSciences LLC. Respect the Refuge and Corn Design® and Respect the Refuge® are registered trademarks of National Corn Growers Association. All other trademarks are the property of their respective owners. ©2013 Monsanto Company. 08302013MEA



