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Technology Development & Agronomy by MONSANTO

Current News and Updates

August is the month where we see lots of things happening. Hot weather is the norm, so make sure you keep hydrated and read over the tips on dealing with the heat. Pollination is occurring throughout our geography and within 60 days we should have some corn that is black layered. Get ready for silage harvest, make sure your equipment is ready to go and your have penciled in the harvest date. Those that need to late summer seed alfalfa, should be making plans and obtaining the seed. Genuity® Roundup Ready® Alfalfa will allow us to seed earlier, as weed control is easier and more consistent. The old saying "August makes beans" may hold true again this year, but with all the challenges this crop has had, keep an eye on the various stem diseases that can occur: brown stem rot, sudden death syndrome, and white mold.

Although it is only August, it may be time to start thinking about next year. Corn rootworm adults are emerging and growers need to scout for them to assess the risk for the next year's crop. If high populations of corn rootworm (CRW) exist today, lowering these populations should be a focus of your management plan for 2014. Best management practices for high populations of CRW are:

1. Crop Rotation. Rotating to a non-host crop such as soybean or small grains can be a very effective practice to lower CRW levels in your fields.
2. Product Selection. Plant corn products that contain traits with multiple modes of action to control CRW, such as Genuity® SmartStax® RIB Complete® corn blends.
3. Insecticide Programs. Managing CRW beetles this summer is an important step to help manage CRW next year. If you will be planting a corn product in 2014 that contains a single trait for CRW into a field with a known high level of CRW pressure, a soil applied insecticide should be used.

Heat-Related Illness

Knowing the signs and symptoms of heat-related illnesses can help you avoid serious illness and recognize symptoms of heat-related illness in others.

Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails and the body is unable to cool down. Body temperature may rise to 105° F within 10-to-15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided. Signs and symptoms: red, hot and dry skin (no sweating), throbbing headache, dizziness, nausea, confusion, unconsciousness. What to do? Activate site emergency response, get the victim to a shady area, cool the victim rapidly using whatever methods you can, call the hospital emergency room for further instructions, do *not* give the victim fluids to drink, get medical assistance as soon as possible.

Heat exhaustion is a milder form of heat-related illness. It is the body's response to an excessive loss of the water and salt content in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment. Signs and symptoms: heavy sweating, cool, pale or moist skin, muscle cramps, tiredness, weakness or fainting, dizziness or headache, nausea or vomiting. What to do? Drink cool, nonalcoholic beverages, rest, take a cool bath, shower or sponge bath, get into an air-conditioned environment, change into lightweight clothing.

Heat cramps usually affect people who sweat a lot during strenuous activity. Heat cramps may also be a symptom of heat exhaustion. Signs and symptoms: muscle pains or spasms-usually in the abdomen, arms or legs. What to do? Stop all activity, sit quietly in a cool place, drink water, clear juice or a sports beverage, do not return to strenuous activity for a few hours after the cramps subside; further exertion may lead to heat exhaustion or heat stroke, seek medical attention for heat cramps if they do not subside in one hour.

Planning for Silage Harvest

Timely harvest of corn silage is necessary for getting the highest quality silage possible. Determining the optimum time to harvest corn silage can be difficult, but it starts with careful monitoring of the crop.

The first indicator for predicting harvest is silking date. This can be used to determine whether fields are developing according to schedule. Although corn products vary in their maturity during vegetative stages of development, the period of grain fill is fairly consistent across maturities.[1] In general, silage harvest can begin shortly after 50% milk line (Figure 1). This translates to approximately 42 to 47 days after silking. While this is a traditional rule of thumb, whole plant moisture at 50% milk line can range from 53 to 73%.[2] To more accurately identify the best time to harvest for silage, test for whole plant moisture.

As the kernel milk line moves down the kernel following the dent stage, select several whole plants to be chopped and sampled for moisture content. If using an on-farm method such as the microwave-oven test to determine moisture content, make sure that a stable weight is reached at the end before determining whole plant dry matter content. If not, dry matter content may be overestimated. Another option is to send a sample to a commercial testing lab.

Figure 1. Corn ear at 50% milk line.

Deciding when to start sampling for moisture also depends on the silage storage structure to be used. The recommended moisture content for ensiling in a horizontal bunker is 65 to 70%; begin sampling for moisture content at about 80% milk. The recommended moisture content for an upright oxygen limiting structure is 50 to 60%; begin sampling for moisture content at 40% milk. Once the moisture for a field is known, a dry-down rate of 0.5% moisture loss per day can be used to predict when the field will be ready for harvest.

Sources:
[1] Lauer, J. 2000. Predicting corn silage harvest dates. Wisconsin Crop Manager. University of Wisconsin. http://corn.agronomy.wisc.edu (verified 7/29/13); [2] Lauer, J. 1996. Harvesting silage at the correct moisture. Wisconsin Crop Manager. University of Wisconsin. http://corn.agronomy.wisc.edu (verified 7/29/13); Shaver, R. et al. 1999. Here are some tips on corn silage harvest management. University of Wisconsin. http://www.uwex.edu (verified 7/29/13).

Evaluating Corn Pollination

Knowing the status of your corn crop and the percentage that is pollinated can help make management decisions for the remainder of the season and plan for harvest.

Evaluate Pollination. The degree of successful pollination and fertilization can be determined by examining ears. Randomly select an ear and remove the husk, being careful to leave silks intact. Shake the cob and observe the number of silks hanging from the ear and still attached to ovules. Silks that are still attached indicate unfertilized ovules (Figure 2). Repeat this step in the middle of the field and at each corner to help determine the percent of the crop that is pollinated. Taking note of pollination progress and subsequent kernel growth stage, can help to predict when the crop will reach black layer or physiological maturity (Table 1).


Figure 2. An ear being checked for pollination progress. Ovules with silks still attached have not been pollinated.

Table 1. Kernel growth stage and average days/GDUs to maturity.

Stage	Calendar days to maturity	GDUs to maturity
R1—silk	55—60	1100—1200
R2—blister	45—50	875—975
R4—late milk/dough	35—40	650—750
R5—early dent	25—30	425—525
R5.5—fully dented	13—17	200—300
R6—physiological maturity	0	0

Source: Corn development. 2013. University of Wisconsin. http://corn.agronomy.wisc.edu.

Unfertilized Kernels. Silk elongation begins at the butt of the ear. Tip silks are usually the last to emerge and the last to be pollinated. If ears are long, tip silks may emerge after pollen shed, leaving the ovules at the tip of the ear unpollinated. In addition, moisture and/or heat stress can interfere with the synchronization of pollen shed and silk emergence, leading to incomplete kernel set.

Aborted Kernels. Incomplete kernel set may also be the result of aborted kernels. These are ovules that have been successfully pollinated, but for some reason have ceased development. Aborted kernels appear shrunken and white.

Sources:
Producers advised to check corn pollination to re-evaluate decisions. 2001. Tri State Neighbor. http://www.tristateneighbor.com (verified 7/26/13); Lauer, J. 2006. Concerns about drought as corn pollination begins. University of Wisconsin. http://corn.agronomy.wisc.edu (verified 7/25/13).

Late Summer Seeding of Alfalfa

There are several advantages to establishing an alfalfa stand in the late summer. The decision to late summer seed alfalfa should take into consideration weather conditions and available soil moisture.

Advantages and Risks. Late summer seeding of alfalfa can have advantages over spring seeding in some cases. Weed and insect pests rarely limit late summer stand establishment. With warmer soil temperatures alfalfa germinates, grows, and develops a canopy at a much faster rate than a spring planting. Late summer plantings can help alfalfa escape seedling diseases that are common in wet, cool spring soils. Yields of late summer alfalfa seedings are generally higher than yields of spring seedings during the establishment year.[2] One major concern with late summer seeding of alfalfa is the possibility of moisture stress during germination and seedling establishment. Seeding decisions should take into account current soil moisture conditions and short-term weather forecasts. The threat of an early killing frost is also a risk with late summer seedings.

Considerations. Keep in mind these points to help with late summer alfalfa seeding and stand establishment:

- Make sure there is adequate soil moisture. If soil is too dry, seeds may not germinate or get enough growth to survive the winter.
- Follow planting date recommendations (Figure 3). Alfalfa requires at least 45 days of good growing conditions to store carbohydrates for winter survival.[1] In general, seed alfalfa 6 to 8 weeks before the average first killing frost.

Figure 3. Recommended late summer seeding dates for alfalfa. Source: Dan Undersander, Univ. of WI.

- Select alfalfa products with a good winterhardiness score and good resistance to root and crown diseases.
- Control weeds, but avoid excessive tillage that can dry soils.
- Firm soil before and after planting if needed to ensure proper seed-to-soil contact and retain soil moisture.
- Postemergence herbicides may be needed if severe weed pressure or volunteer grain problems develop. Minimizing weed competition is critical to promote adequate development of alfalfa before a killing frost.
- Selecting a Genuity® Roundup Ready® Alfalfa product can help with ease of establishment due to the broad application timing window to control weeds with Roundup® agricultural herbicides.

Sources: [1] Undersander, D. Late summer alfalfa seeding. University of Wisconsin Extension. http://www.uwex.edu (verified 7/29/13); [2] Rankin, M. Establishing alfalfa during late summer. Focus on Forage. University of Wisconsin Extension. http://www.uwex.edu (verified 7/29/13); Undersander, D. et al. 2011. Alfalfa management guide. American Society of Agronomy.

Stem Diseases of Soybean

Brown stem rot (BSR), sudden death syndrome (SDS), and white mold (WM) are common stem diseases of soybean. Proper identification and evaluation of soybean diseases can help make management decision for next year.

Symptoms of **BSR** are typically present after pod formation. The most common symptom is the brown to reddish-brown discoloration of the pith or central portion of the stem. There are two genotypes of the pathogen that causes BSR; however, only one of the genotypes can cause the foliar symptoms. Foliar symptoms include chlorosis, wilting, and the browning of leaf tissue between the veins. Dead leaves usually remain attached to the plant. When foliar symptoms do occur, they tend to be more severe when rain or irrigation follows flowering, in soil with pH levels ranging from 5-7, and under cool weather conditions.[1] Management practices include the planting of BSR resistant varieties and rotating to non-host crops for periods of two to three years. Additionally, earlier varieties may allow for considerable seed development or maturity prior to BSR occurrence.

The fungus that causes **SDS** infects the roots and the base of the stem, sending toxins to the leaves. Foliar symptoms begin as small, bright yellow spots on the lower leaves and spreads to the upper leaves as the disease severity progresses. Spots gradually enlarge and develop a brown necrotic center, while the interveinal tissues are killed. In contrast to BSR, dead SDS leaves usually drop off leaving the leaf petiole attached to the plant. Unlike BSR, symptoms of SDS may be seen during the vegetative growth stages. However, they are most commonly seen during the early reproductive growth stages through pod fill. Splitting the stem of a soybean plant infected with SDS will reveal a slightly tan to light brown discoloration of the cortex up to 2 inches above the soil line and a normal white to cream colored pith. This distinguishes the two diseases because soybean plants infected with BSR have a reddish-brown discolored pith (Figure 4). Management practices for SDS include planting varieties that are resistant or moderately resistant to soybean cyst nematode, delayed planting, deep tillage, and cultural practices that improve soil drainage.

Figure 4. Split stems with symptoms of BSR (top) and SDS (bottom).

Symptoms of **WM** may appear as water-soaked lesions at stem nodes. The most obvious sign of WM is the

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Stem Diseases of Soybean (cont. from p 3)

Figure 5. Soybean stem infected with WM.

white, cotton-appearing fungal growth on soybean stems (Figure 5). As the fungus grows on and within the plant, water and nutrients flowing to upper plant parts becomes restricted by the developing sclerotia and lesions that girdle the stem. Infected plants wilt and upper leaves turn grayish green and then brown at death. Stems appear bleached late in the season. Economic losses are often attributed to shriveled seed and poor seed quality caused by fungal growth. Management practices for white mold include planting at moderate to low populations in rows of 15 inches or greater to help increase air flow, planting tolerant varieties, rotating with non-host crops, controlling weeds, and cleaning equipment before entering another field. Fungicides such as Approach™, Topsin®, and Domark®, and Cobra® herbicide can be effective in helping to control WM. The best time for such applications is at R1. Applications after disease symptoms are visible should be avoided.[2]

Sources: [1]Dorrance, A. E. and Mills, D. 2008. Brown stem rot of soybean. Ohio State University Plant Pathology Department Fact Sheet. AC-35-08. http://ohioline.osu.edu. (verified 7/8/2012); [2]Staton, M. 2012. Applying foliar fungicides for control of white mold in soybeans. Michigan State Univ. Ext. Online: http://msue.anr.msu.edu. (verified 7/8/12); Diseases of soybean. Sudden death syndrome. BP-58-W. Purdue University. http://www.ces.purdue.edu (verified 7/8/2012); Diseases of soybean. White mold. BP-43-W. Purdue University Extension. http://www.ces.purdue.edu. (verified 7/8/2012).