WALKING YOUR FIELDS®

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DUPONT PIONEER

August 13, 2013

LOCAL CONDITIONS

SOUTHERN ILLINOIS: The weather this summer continues to be very advantageous for the crops. Most areas have seen adequate rainfall, with only isolated areas receiving too much or too little precipitation. All in all, the crop looks pretty good.

Temperatures have been just been plain pleasant. Cool nights have allowed the corn crop to "recover" well and keep the "factory" running efficiently. One consideration regarding the weather is the number of cloudy days this summer. The lack of direct sunlight in cloudy conditions reduces solar radiation and consequently can have an effect on the crop. At the stage most of the corn is at, it will be important to monitor for stalk rots until the crop is finished. Soybeans are also coming along nicely as many of the earlier planted beans have set or are setting pods. The double-crop soybeans in some areas are struggling slightly because of the cooler temperatures and wet conditions at planting. However, keep in mind that soybean yields are all about August and September, a lesson well learned from last year. Also, it is time to be planning wheat acres for this fall. Please contact your local Pioneer sales representative for your Pioneer® brand wheat seed needs soon, as we expect demand to once again outpace supply of the newest genetics.

CORN GROWTH AND DEVELOPMENT

After silks turn brown, corn growth is characterized by a period of rapid dry matter accumulation in the kernel. From this point until black layer the plant will pump carbohydrates into the maturing ear. At the roasting ear or blister stage of development, which occurs 10 days to 2 weeks after pollination, the cob has reached its full length and diameter. All the potassium and 70% of the nitrogen and phosphorus needs have been taken up by the plant. As growth progresses, the demand for moisture decreases and the detrimental effect from outside stresses (hail, heat, etc.) also decreases. Ideal growing conditions for corn during this period of development include:

- Clear, sunny days for maximum photosynthesis
- Daytime temperatures in the low to mid 80's
- Cool nights to minimize respiration
- Adequate moisture to meet transpiration needs

At maturity (R6) the black layer forms at the kernel's attachment, blocking movement of dry matter to the kernel. Kernels have attained their maximum dry weight. Stress at this point has no yield effect unless plants lodge or ears are damaged, e.g., from high winds or insect feeding.

KERNEL FILL

Unfilled ear tips and scattered grain are evident in some fields this year. Several factors can cause this to occur.

- Dry and hot conditions *during* pollination can cause the silks at the tip of the ear to emerge after most of the pollen has fallen. In those cases, the ear tips may not have pollinated. The cob will remain its normal color.
- Dry and hot conditions *after* pollination may cause kernel abortion at the tip of the ear. This is evident by the drying up of kernels. They will be yellow in color.
- Insect feeding on the emerging silks by Japanese beetles and corn rootworm adults may have interfered with pollination in some fields. Sometimes, these ears will also have a scatter-grain appearance.
- Nutrient deficiencies can cause kernel abortion at the ear tip and increase the risk of the corn missing nick.
- With high plant populations relative to growing conditions, some kernel tip abortion may be observed as the corn plants adjust to growing conditions. (If ears are filled all the way to the tip, it may indicate that populations were not high enough.)
- Uneven seedling growth due to insect feeding, soil compaction, or other environmental conditions may cause late-emerging plants to miss pollination.
- Under ideal pre-flowering conditions, the cob of some hybrids will often grow longer than the final ear length resulting in some "ear nose" even when full yield potential is realized.

Grain Fill Stages and Stress Effects			
Stage	**Moisture**	**Days after Silk**	**Stress Effects**
Blister	85%	10-14	Kernel Abortion
Milk	80%	18-22	Kernel Abortion
Dough*	70%	24-28	Kernel Weight
Dent	55%	35-42	Kernel Weight
Black Layer**	35%	55-65	None

*50% dry weight accumulation.
**Maximum dry weight accumulation.

READ MORE ONLINE: Corn Grain Yield in Relation to Stress During Ear Development (http://phbn.ws/EarDevStressYld)

NITROGEN DEFICIENCY

Firing of lower corn leaves is a sign that the plant is not taking up adequate nitrogen, but it does not always mean nitrogen rates were too low. Dry soils, heat stress, and soil compaction can restrict the plant's ability to take up nitrogen. Poor root growth is a major contributor to limited uptake of N.

Ponded areas of fields that were saturated for a week or longer could have also lost a large percentage of applied nitrogen. Severe nitrogen deficiencies can result in aborted kernels if enough of the photosynthetic "factory" is damaged. The photo on the left shows a field that will likely suffer yield loss due to the bottom third of the plant firing. Tip-back often occurs under these conditions, plus kernel size could be affected (see photo on right). Also, corn in areas that run short of nitrogen will typically be the first to develop stalk rots.

Image used under permission of R.L. Nielsen, Purdue Univ.

CROP WATER USE

Despite the wet spring, rainfall has been limited in some areas lately. Corn water use spikes during pollination. Soybean water use peaks during flowering and pod development. When scheduling irrigation, consider the water needs of the crop (see table) in combination with the amount of rainfall received and the water holding capacity of the soil.

CORN		SOYBEANS	
Growth Stage	**Water Use (inches/day)**	**Growth Stage**	**Water Use (inches/day)**
Tassel	0.32	Late Vegetative Growth	0.25
Silking	0.34	Flowering (R1-R2)	0.30
Pollination	0.34	Pod Development (R3-R4)	0.30
Dough	0.25	Seed Fill (R5-R6)	0.25
Dent	0.10	Maturation	0.10

CORN LEAF DISEASE UPDATE

Gray leaf spot (GLS) can be a dominant disease in corn in our area. A susceptible hybrid will allow lesions to develop rapidly as shown in the top picture at right. If a hybrid is moderately resistant to gray leaf spot, it will restrict the growth of the lesions as shown in the lower picture at right.

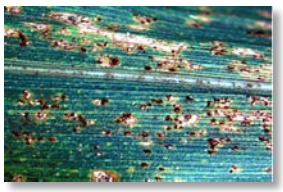
READ MORE ONLINE: Tips for Managing GLS in Corn Using Foliar Fungicides (http://phbn.ws/GLS_Fung)

Northern corn leaf blight (NCLB) thrives when relatively cool summer temperatures coincide with high humidity and moist leaf surfaces. NCLB lesions are being observed both in the lower and upper crop canopy. Lesions near the top of the corn plant are likely a result of NCLB spores being blown in by the wind. NCLB lesions on the lower leaves are coming from spores produced on crop residue within the field.

There are two primary strategies for breeding NCLB resistance into hybrids: 1) Multigenic resistance which provides resistance to all races of NCLB, and 2) Single-gene resistance which is race-specific. The picture on the left is an NCLB lesion on a hybrid with single-gene resistance. NCLB is still able to infect the plant, but note the yellow ring around the lesion. This indicates the infection is being restricted by the genetic resistance of the hybrid. This lesion will enlarge at a much slower pace and the number of spores produced from this lesion will be reduced significantly.

READ MORE ONLINE: Managing NCLB Race Shifts (http://phbn.ws/NCLB_Race)

Common rust and southern rust. Common rust pustules are evident in many fields. Southern rust is a more likely threat to the corn crop in southern Illinois and Indiana. Yield loss in hybrid corn is generally much higher for severe southern rust epidemics than for common rust outbreaks. Losses depend on timing of infection, amount of leaf area damaged, and location of damaged leaves on the plant. If significant damage to upper leaves occurs early in the life of the hybrid, yield losses will be higher. If damage is confined to lower leaves of the corn plant or occurs in the later reproductive stages of development, less economic loss would be expected. Consequently, the latest-planted corn in our area is at higher risk for yield loss. See the following chart comparing the rust diseases.

	Common Rust 	**Southern Rust** 
Ideal Environment	Cool to warm; Moist 60-77 degrees F	Warm to hot; Moist 77+ degrees F
Appearance of Pustules	Large, circular to elongated	Small circular, pinhead appearance
Color of Pustules (spores)	Brown to cinnamon-brown	Reddish orange
Location of Pustules	Both upper and lower leaf surfaces Infects leaves only	Upper leaf surface May also infect husks

VIDEO ONLINE: ID Southern vs. Common Rust in Corn (http://phbn.ws/IDCornRust)

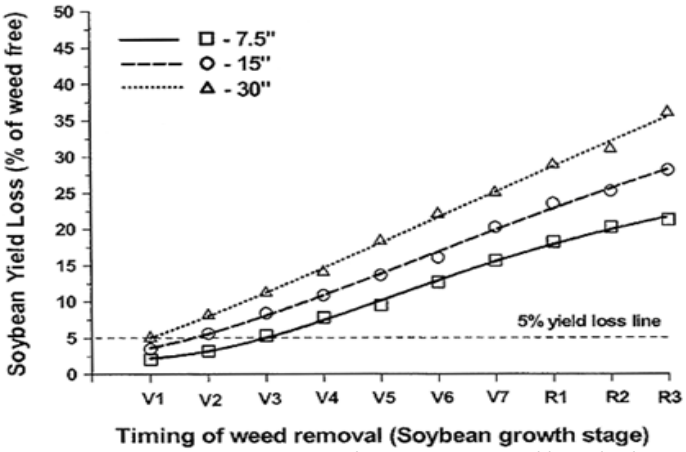
READ MORE ONLINE: Common and Southern Rust in Corn (http://phbn.ws/CornRust)

LATE-SEASON GLYPHOSATE APPLICATIONS

Late applications of glyphosate on glyphosate-resistant soybean varieties can cause yellowing on newly emerging leaves. Typically, 1-3 trifoliate leaves will emerge with the yellow discoloration before green trifoliate leaves begin to emerge again. Does the yellowing reduce yield? In all likelihood, the answer is no. Glyphosate-resistant soybean varieties have been evaluated by research and shown to yield the same with or without glyphosate applied. Remember, glyphosate applications on glyphosate-resistant soybeans are off label once plants reach R3.

EARLY WEED PRESSURE AFFECTS SOYBEAN YIELDS

With the wide acceptance of glyphosate-tolerant soybeans, some producers have become relaxed in their weed control strategies in soybeans. Weeds compete for the same nutrients, water, and sunlight that soybeans need for growth. This is especially true for high-yielding soybeans. As shown on the graph, removal of weeds early results in greater yields. The use of a residual herbicide before or at planting can help spread the application window for a post application, which many times will also help with weed resistance management since the residual herbicide of choice will often have a different mode of action.



Source: Knezevic, S. Z., S. P. Evans, and M. Mainz. 2003. Yield penalty due to delayed weed control in corn and soybean. Crop Management doi: 10.1094/CM-2003-0219-01-RS.

SOYBEAN DISEASES

Remain vigilant and scout for soybean diseases.

Downy mildew is favored by moist, humid conditions and is present in the upper leaves of the canopy. Irregular-shaped, pale yellow-green lesions appear on the upper surface along with a gray fuzzy growth on the lower leaf surface. Fungicides are not economically feasible; consider crop rotation, tillage, and variety selection to manage future infections. Although it is possible to have some yield loss, returning to drier growing conditions is often all it takes for plants to resume normal growth and development.

VIDEO ONLINE: Soybean Scouting Tips (http://phbn.ws/SB_Scouting)

Soybean ***sudden death syndrome (SDS)*** may show up in fields that were wet early in the season. Although SDS is a root rot, foliar symptoms appear as interveinal chlorosis followed by necrosis. Symptoms are typically worse under late drought-stressed conditions or in areas of high nematode pressure. Conditions favoring initial infection of this disease include:

- Cool, wet soils during early growth
- Poorly drained, compacted soils
- Soybean varieties with poor SDS tolerance

There is no rescue treatment. Common practices used to avoid SDS include:

- Crop rotation
- Avoid planting fields with a history of SDS pressure in early, cool conditions
- Plant soybean varieties with higher tolerance ratings to SDS

Refer to **soybean product information** on **pioneer.com** or contact a Pioneer sales professional for the latest SDS ratings for Pioneer® brand soybean varieties.

READ MORE ONLINE: Sudden Death Syndrome (http://phbn.ws/SDS_)

Soybean vein necrosis virus (SVNV) is a relatively new disease in our area. SVNV is a virus that is transmitted by thrips. Early symptoms are light green to yellow (chlorotic) patches near main leaf veins where thrips fed (top photo). On susceptible varieties, chlorosis progresses to necrotic (dead) tissue and eventual leaf death and desiccation (bottom photo). Lesions are restricted or progress slowly on resistant varieties. Most varieties express moderate symptoms; a few express severe leaf necrosis and canopy loss.

READ MORE ONLINE: Soybean Vein Necrosis Virus (http://phbn.ws/SVNV)

Frogeye leaf spot may be observed in some fields this year. Frogeye is a foliar disease that can reduce soybean yields. This disease has a characteristic lesion that forms on new leaves. On the top of the leaf, the lesion is round, the center is gray, and it is surrounded by a characteristic purple to red border. On the bottom of the leaf, a spore mass can be seen in the center of the lesion. Fortunately, most Pioneer® brand soybean varieties have a high level of resistance to this disease. Fungicide applications are effective at controlling this disease.

READ MORE ONLINE: Frogeye Leaf Spot on Soybeans (http://phbn.ws/Frogeye)

FALL ALFALFA SEEDING

Fall alfalfa seeding can be successful with proper management techniques. Advantages to planting alfalfa in the fall include:

- Higher yields the following year vs. a spring seeding
- Less weed competition compared to spring planting
- Fewer disease issues (i.e. Pythium, Phytophthora, Aphanomyces)

Although there are many advantages to a fall seeding, the main limitation is having enough moisture to get the plants established. Alfalfa requires 6-8 weeks of growth prior to a killing frost. It must establish a crown and retract that crown prior to frost to successfully survive winter dormancy.

Some of the keys to establishing and keeping a stand include:

- ***Variety selection:*** Variety selection should be based on yield, winterhardiness, and genetic resistance to common diseases. Important alfalfa diseases include Phytophthora root rot, bacterial wilt, and Fusarium wilt.
- ***Fertilization:*** Proper soil pH levels are critical to alfalfa production. Soil pH levels of 6.5-7.0 provide the best environment for nitrogen-fixing bacteria to fix nitrogen and also maximize soil nutrient availability. Take soil tests before preparing the ground to determine lime and fertilizer needs.
- ***Field preparation:*** Prepare a firm seedbed. As you walk across the field prior to planting, your feet should only sink in ¼-½". A firm seedbed prior to seeding will help to keep the seed from being buried too deep and improves seed-to-soil contact.
- ***Planting depth:*** It is often emphasized how important proper planting depth is with alfalfa. Seed cannot be too deep, but it should not be too shallow either. Depth of planting should be ¼-½" deep on clay or loam soils and ½-1" deep on sandy soils, depending on the soil moisture.
- ***Planting rate:*** Seeding rates should be around 16 lb of pure live seed/acre if favorable seedbed conditions are present and good equipment is being used.
- ***Pure Live Seed = % Purity x % Germination ÷ 100***

Products for Fall Seeding	
PIONEER® Variety/Brand**	**Primary Selection Criteria**
55V50	Muscle
54QR04*	Glyphosate resistance
54Q32	Quality forage
55H94	Leafhopper resistance
54B66 Brand	Premium blend

READ MORE ONLINE: Alfalfa Stand Establishment (http://phbn.ws/AlfStandEst)

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Always read and follow pesticide label directions. Crops that contain the Roundup Ready gene confer tolerance to glyphosate, the active ingredient in Roundup® agricultural herbicides. Roundup agricultural herbicides will kill plants that are not tolerant to glyphosate.

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FARM PROGRESS 2013 SHOW
August 27, 28 & 29, 2013
Decatur, Illinois

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