Current News and Updates

One of the more familiar sayings is “the more things change, the more they stay the same.” This is certainly true in agriculture. We now have more technology, such as enhanced genetics; and more tools, like data science, than ever before to help growers produce better harvests. However, weather conditions still play a huge role in determining our final outcome. We’ve seen that across our geography this year and while in general production was above average we still have those areas which were hampered by too little or too much rainfall.

The other familiar feeling for this time of year is that, while we are excited about this years’ harvest, we’re already looking forward to next year and the planning for next year has already begun. Hopefully the articles in this newsletter will give you information to help in this planning process.

As always, if you have any questions or concerns, please reach out to your local DSM or agronomist and keep safety top of mind during this harvest season.

Thanks,
Your Southeast Technical Agronomists

Cotton Seed Sprouting and Regrowth

Several days of rainfall and overcast skies in late September raised concerns about cotton seed sprouting and late-season regrowth. Similar conditions in 2015 caused significant seed sprouting and challenging regrowth. Fortunately, much of the upper Southeast cotton crop had not yet been defoliated when the rains came this year, leaving much less of the crop vulnerable to seed sprouting.

“Cotton growers should plan to defoliate on a normal schedule, realizing that the cooler temperatures this fall will mean that defoliants will be slower to act,” says Guy Collins, cotton extension associate professor, North Carolina State University. (G. Collins, personal communication, September 27, 2016)

Once cotton is defoliated and bolls begin to open, the lint and seeds are exposed to moisture. “Much of our cotton was planted later this year and most of it had not been defoliated when the rains came in September,” says Collins. “We got three or four days of rain that could have started some seed sprouting, but it didn’t take but a dry day or two to pretty well stop the sprouting. If more rain comes before harvest, growers should scout frequently to determine if seed are beginning to sprout.”

Sprouted seed can cause several issues, including: higher trash content, seed coat fragments, and lint discoloration. In addition, if fields are harvested before sprouted seeds dry down, this could lead to undesirable moisture in harvested cotton. Sprouted seed may also result in decreased seed quality and significantly less seed available to offset ginning costs. It is important for farmers to monitor modules for increases in temperature from high-moisture cotton that could lead to further reduced quality and ginning difficulties.

“It is absolutely critical to wait until these germinated seed completely dry out before harvesting these fields,” says Collins. He says warm, sunny, dry weather can quickly dry sprouted seed, reducing moisture content and decreasing harvesting and ginning challenges.

Plentiful moisture late in the season may also stimulate regrowth in the top and possibly from the bottom of plants. Under these conditions, Collins urges growers to use defoliation products that will kill regrowth and prevent additional regrowth. 161004133225
Corn Product Selection Considerations
Maximizing yield potential and minimizing risk are two main goals when selecting corn products. Planting products with different growing degree unit requirements to mid-pollination can help decrease risks of heat and drought stress during pollination. Selecting corn products that can handle the additional stress associated with corn-on-corn environments can be challenging.

Generally, the first selection criteria when evaluating corn products is yield potential, followed by various agronomic characteristics (Figure 1). Product performance in plots across multiple locations and years can indicate the consistency and yield potential of a product, and in which environments it tends to excel or falter.

Agronomic Trait Considerations
Important agronomic considerations include standability, disease and drought tolerance, insect and herbicide resistance, and good emergence and seedling vigor in cool conditions.

Emergence ratings should be considered when selecting corn products. Commercial products often have very good or excellent vigor and emergence ratings. A strong emergence and vigor rating is especially important if a product will be placed in a no-till or reduced tillage field, or will be planted early, as these management practices can result in cool, wet soil conditions.

Products should be evaluated for tolerance to diseases that are common in your geography. Keep in mind that fungicide applications may mitigate some of the impact associated with a product’s susceptibility to foliar fungal diseases such as gray leaf spot and northern corn leaf blight, although that yield protection comes at a higher cost and risk than product resistance or tolerance.

Stalk and root strength are particularly important for corn that will be planted at a higher population, or for corn that is likely to be under drought stress or any other stress that reduces standability. Stalk diameter decreases with increasing population and drought stress favors stalk rot. If stalk rot appears to be a persistent problem in your system, consider placing more importance on standability and stalk rot resistance in your product selection.

Drydown, stalk quality, and root strength can help manage harvest schedules. Several variables can affect these characteristics such as stresses endured throughout the growing season, untimely frosts, and various pathogens.

Diverse Relative Maturities
A good management practice is to plant a combination of products with early-, mid-, and full-season relative maturities (RM) to help spread out the harvest schedule and help minimize losses from drying costs and lodging. The early RM products can help with getting harvest equipment set properly and fulfilling early fall delivery commitments to elevators. Often, the majority of acres in an operation should be planted to mid- and full-season products due to the tendency for them to have higher yield potential since they have more days to photosynthesize and fill grain. Planting a spread of RMs can help mitigate risks associated with an early fall frost such as low test weight, lower yield potential, and poor drydown.

Growing Degree Unit Requirements
An often overlooked characteristic when selecting a package of corn products is growing degree unit (GDU) requirements to flowering or mid-pollination. Spreading out GDU requirements to mid-pollination can help decrease the risks of heat and drought stress during pollination.

Corn-on-Corn Production
In addition to yield potential, corn-on-corn systems may have the additional challenge of cooler and wetter soils due to heavy residue. Choosing a product with strong early emergence is important. In geographies where technologies exist, planting products with insect protected trait(s) can help minimize the risk of damage from insects such as northern corn rootworm, western corn rootworm, corn earworm, and European corn borer. Diseases such as gray leaf spot, northern corn leaf blight, southern corn leaf blight, stalk rots, ear rots, seedling blights, and Goss’s wilt are potentially more severe in corn-on-corn production. Though fungicide applications can help effectively manage many of the foliar fungal diseases, selecting corn products with high levels of resistance to these types of diseases is often the best management strategy.

In some cases, continuous corn acres should be rotated among corn products. Many of the pathogens that cause diseases overwinter in crop residue. If one of these diseases occurs on a corn product in one year, inocula will be present in the debris. Therefore, there is a higher risk that the same product will be infected again if it is used in the same field the next year. Rotating to a different product with better ratings for that specific disease can help address this.

Sources:
Web sources verified 9/27/16 121912010102

Figure 1. Emergence, vigor, disease tolerance, and root and stalk strength are key corn product characteristics to consider, in addition to yield potential.
Understanding Crop Residue Decomposition

Crop residue provides organic carbon and nitrogen to soil biology. The soil biological community needs carbon and nitrogen for food and energy. Additionally, crop residue physically protects soil from wind and rain erosion. Residue amount, size, and distribution are affected by agricultural practices. However, residue decomposition is controlled by biological processes being influenced by environmental and soil conditions.¹

In terms of the N cycle, the residue decomposition process relies on immobilization and mineralization, which both involve soil microbes. Soil microbes feed on the carbon in crop residues and require N to do so. Immobilization is when N is consumed by soil microbes. Mineralization is the release of N that generally happens upon the death of soil microbes. In other words, nitrogen within the residue remains tied up or immobilized until decomposition is complete and is released by soil microbes through mineralization.

Microbes try to maintain a carbon to nitrogen (C:N) ratio of approximately 10:1 in soils.² Ratios among crop residues vary greatly; alfalfa, soybean, and other legumes generally have lower C:N ratios near 20:1, which usually results in quicker mineralization.³ Corn has a higher C:N ratio (70:1) than soybean. Crop residues with higher C:N ratios take more time to decay and result in higher amounts of N being required by the microbes to decompose residues. If not taken into account, the microbe requirement for N can compete with a growing corn crop for available N to maintain their desired C:N ratio of 10:1.²

Approximately 50 pounds of residue are produced for each bushel of corn harvested.⁵ Crop residue is composed of lignin, cellulose, hemicellulose, and nutrients. Microorganisms breakdown these compounds, and the decomposition rate is largely affected by moisture and temperature. Some of the conditions that favor decomposition of residue include warm, moist weather, small pieces of residue, and maximized contact between residue and the soil.

Nitrogen deficiency symptoms can occur during immobilization; however, research has not consistently shown a benefit to fall N applications intended to assist in residue decomposition.⁶ Timing, cooler temperatures, and/or dry weather might play a role in the effectiveness of fall N applications. Higher rates of spring-applied N may be an option since the amount of N normally applied may be immobilized by microbes for residue decomposition during the growing season.

Disturbing the soil with tillage may not increase residue decomposition. A recent three-year study evaluated the effect of tillage on residue breakdown. Field and laboratory results demonstrated no significant differences in the breakdown or percent residue that remained among deep tillage, strip-tillage, and no-till systems.¹

Residue can be managed by increasing the populations of soil microorganisms. Cover crops provide additional energy, carbon, and nitrogen to sustain activity of a wide range of soil microorganisms. A major portion of soil microbes live in a state of dormancy as they are under conditions of starvation, especially in tilled soils.⁷ According to a three-year study in Iowa soils, corn residue was reduced to below 45 percent after 12 months in the field.¹ Crop rotation cycles that include legume crops with lower C:N ratios returns N back into soil more quickly and gives residue with higher C:N ratios (such as corn) more time to decompose.

Soil microorganisms use nutrients from crop residue and may immobilize plant available N before mineralizing the nutrient. Carbon to nitrogen ratio of crops is an indicator of how quickly residue can be decomposed and N released. Fall N applications and tillage are not sustainable economically or environmentally for all growers. Both practices bring additional management costs and can negatively affect water quality. Tillage could further deteriorate soil health and increase the risk of soil erosion on some fields. Rate of residue breakdown is aided by practices that enhance soil health and soil microorganism populations.

Sources:
² Hoorman, J.J. and R. Islam. 2010. Understanding soil microbes and nutrient recycling. The Ohio State University, SAG-16-10.
Web sources verified 9/30/16
140909011101
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.

This publication was developed in partnership with Technology Development & Agronomy by Monsanto.

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. Asgrow and the A Design®, Asgrow®, DEKALB and Design® and DEKALB® are registered trademarks of Monsanto Technology LLC. Deltapine® is a registered trademark of Monsanto Company. All other trademarks are the property of their respective owners. ©2016 Monsanto Company. 160923104848 100716JEH.