The cardinal rule of planting, regardless of tillage, is to plant the seed into soil that is in condition to provide the seed its best chance of germinating and emerging as fast as temperatures allow, and as uniformly down the row as possible. But there's more: we need to keep in mind how the roots of the plant will grow, and we need to manage soil conditions so that established plants have the best chance to grow a root system that will both anchor the plant well and help it to tap soil water and nutrients that it needs.

The obvious first step is to make sure that seed is planted into soil that is loose enough to provide good seed-soil contact, and that seed is covered with enough soil to allow normal development. These are critically important regardless of tillage system, but there is a tendency in tilled soils to bury seed too deep and to press soil too firmly around the seed, while in no-till the failure to cover seed adequately is a common problem. It is important to prevent sidewall compaction and other planter issues that can prevent full establishment of the nodal root system—the root system the plant comes to depend on.

Even after plants are established, with the nodal root system growing out into the bulk soil, zones of soil compaction can negatively affect root system size and shape. If the weather turns dry, this can become a critical limitation to the ability of the plant to take up enough water. For example, even in the "forgiving" soils of eastern Illinois in 2007, many producers found lower yields in the lower-lying parts of fields. The season was marginally dry, so we would normally expect the lower parts of fields, with higher organic matter, to yield more. The only plausible reason they did the opposite was that the lower areas were slightly wetter at planting, and that more compaction slightly limited the ability of the roots to take up enough water.

Summary: Getting it right

In summary, seed placement both horizontally and vertically, into a soil environment that provides good seed-soil contact, a good rooting medium, and adequate plant nutrients and water is vitally important in producing top corn yields. Seed companies compete to develop and deliver seed with genetic ability to emerge well under a range of conditions, with good uniformity and protection against soil pathogens and insects. Equipment companies have worked to produce planters better able to place seed at uniform depth and to distribute seed uniformly, and producers take care to assure that planting takes place under good soil conditions. These factors have combined to reduce the problem of getting a good stand, even as planting has moved earlier, and thus into soils that are colder on average. Still, limitations caused at planting time often become yield-limiting when other factors such as weather and pests are less limiting. This means that the need to pay attention to every detail at planting has not diminished at all.

Foliar Fungicides For Gray Leaf Spot (GLS) Control In Corn

Presented By Dr. Melvin A. Newman

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Tests at the Research and Education Center at Milan (RECM), Tennessee have shown a high degree of control of gray leaf spot (Cercospora zeae-madis) with two strobilurin fungicides (Headline and Quadris). Each fungicide was used at 6 oz/a with Penetrator Plus as an adjuvant. Yield increases from the last two years (2006 & 2007) ranged from an average of 27 bu/a on a GLS susceptible hybrid, 19 bu/a increase on a moderately susceptible hybrid and 13 bu/a increase on a tolerant hybrid.

Eight row plots replicated four times on 30" centers were planted no-till with three Pioneer corn hybrids with varying levels of resistance to GLS. They were: susceptible P 32T22, moderately susceptible P 33R76 and P 33V14 for the tolerant hybrid.

Each plot was split into two 4-row plots, so that there was a treated and untreated side-by-side for each of the two foliar fungicides for all three hybrids. This irrigated plot area has been in no-till corn production for the past four years with a high level of GLS each year. Each fungicide was sprayed once at the VT (tassel stage) with a Co2 tractor mounted sprayed using 20 gallons of water per acre. Yields were determined by harvesting with a Almaco SPC 40 plot combine. GLS ratings were taken on Aug. 6 in 2007 and July 7 in 2006 after the susceptible hybrid had reached its highest rating for the unsprayed.

The GLS rating scale ranged from "0" to "10" where 0 = no disease spots present and 10 = the most disease possible. The two year average GLS ratings for the susceptible hybrid was much higher than for the other two hybrids ranging from 5 for the sprayed to 8 on the unsprayed. The two average GLS rating for the moderately susceptible ranged from 2.75 for the sprayed to 4.75 for the unsprayed. The two year average for the tolerant hybrid ranged from 1.25 to 2.0 for the unsprayed. There were higher GLS ratings for the test in 2007 than in 2006 but there was a higher level of control of GLS in 2007.

Yields were higher in 2007 across all plots even though there were more leaf spots. The two year average yield improvement for Quadris was 28 bu/a for the susceptible hybrid, 27 bu/a for the moderately susceptible and 17bu/a for the tolerant hybrid. Headline's two year average yield increase was 26 bu/a for the susceptible hybrid, 11 bu/a for the moderately susceptible and 9 bu/a for the tolerant hybrid.

Both fungicides significantly controlled GLS and increased yields but neither was significantly greater than the other.

Three of the most important points to consider when spraying fungicides for disease control are: 1. resistance to GLS, 2. over all weather conditions especially after tassel, and 3. crop rotation (corn after corn).

Fertility Management For Continuous Corn

Presented by Dr. Gene Stevens
Extension Crop Production Specialist, University of Missouri Delta Center

Corn prices and yields were much higher in 2007 than previous years. However, input costs, especially nitrogen fertilizer, took a big bite out of farm profits. As I write this article, urea is $445 per ton or 48 cents per pound of N. Since wheat planting is up this fall, more soybean and fewer corn acres will probably be planted next year. That could ease demand on N and bring fertilizer prices down in the spring. But we also thought that N prices would go down last spring and they kept going up. If you plant corn, you need to make every pound of N count. From 1999 to 2001, we conducted irrigated corn nitrogen experiments on farmer fields in Hayti, Caruthersville, and Charleston, Missouri to determine whether splitting nitrogen applications would increase corn yields and reduce the optimum N rate needed. We also looked at methods for detecting nitrogen deficiency stress in corn plants for making fertigation decisions.

The study investigated the use of aerial image remote sensing and hand-held chlorophyll meter to develop in-field nitrogen tests for predicting response to fertigation and to detect spatially variable corn N needs for developing variable rate fertilizer maps. In Southeast Missouri, approximately 60% of corn acreage is center pivot irrigated. By adding fertilizer injection pumps and backflow prevention equipment to center pivots, farmers can apply N as needed with irrigation to correct N stress.

Tissue sampling and analysis for nitrogen has traditionally been the method for monitoring corn N status. Chlorophyll meters have been promoted as a quick and reliable tool to monitor N status of crops. A portable instrument developed by the Soil-Plant Analyses Development (SPAD) unit of Minolta Camera is available commercially for estimating chlorophyll in corn plants. During the past decade, scientists have been testing and calibrating the meter for specific crops and regions. However, the meter has largely remained a research tool due to a lack of exposure, the lack of recommendations, and the