(115 CRM) corn hybrids were planted. Plots were fertilized with a single 150 lb/A N application formulated as either urea, Agrotain coated urea, or a slow release N formulation. Corn yield was measured at harvest and indicated that there was no effect from N formulation. However, the hybrid yields averaged across N source were different. The longest maturity hybrid, Pioneer 33M57, yielded greater than 220 bu/A following rice. Pioneer 36B11 yielded 175 bu/A and Pioneer 38P09 yielded 150 bu/A. The hybrid performance relative to maturity is expected since longer season hybrids typically outperform similar shorter season hybrids. Corn yield following rice appears to be enhanced by fracturing the plow pan. This procedure allows the corn plant to develop greater rooting volume, which enhances nutrient scavenging. The fractured plow pan increases water and air infiltration and one year of data suggests that it can alleviate much of the rice effect (Anders 2007).

Corn rotations are not new to Mid-South agriculture. However, new rotations including corn following rice are possible. These rotations are possible by understanding of the soil physical and chemical properties associated with this system. Adding corn to any rotation sequence increases cash flow, diffuses economic risks, manages specific pest problems, and can increase soil quality.

Literature Cited

ACES. 2007. Reniform nematode in cotton. Alabama Cooperative Extension Service ANR-1013. http://www.aces.edu/pubs/docs/A/ANR-1013. accessed 10/12/07

Anders, M. 2007. Assistant professor – systems agronomy, University of Arkansas. personal communication.

Hillel, D. 2004. Soil structure and aggregation in Introduction to environmental soil physics. Pp. 73-89.

Martin, K.L., K. Girma, K.W. Freeman, R.K. Teal, B. Tubana, D.B. Arnall, B. Chung, O. Walsh, J.B. Solie, M.L. Stone, and W.R. Raun. 2007. Expression of variability in corn as influenced by growth stage using optical sensor measurements. Agron. J. 99:384-389.

NCSU 2007. Pest Management Strategic Plan for Cotton in the Midsouth. http://pestdata.ncsu.edu/pmsp/pdf/MidsouthCottonPMSP.pdf. accessed 10/12/07

UAEX 2007. Crop rotations for management of nematodes in cotton and soybean. University of Arkansas Cooperative Extension Service FSA7550. http://www.uaex.edu/Other_Areas/publications/PDF/FSA-7550.pdf. accessed 10/12/07.

Weaver, D.B., K.S. Lawrence, and E. van Santen. 2007. Reniform nematode resistance in upland cotton germplasm. Crop Sci. 47:19-24.

Corn Production Tips For The Mississippi Delta

Presented by Dr. Arnold Bruns

Research Plant Physiologist, USDA-ARS Stoneville, MS

Mid South corn growers have improved their production practices over the past 10 years to a point that they are consistently achieving yields that rival and in many cases surpass those of the Corn Belt states. There are several points worth reviewing that will assist you in continuing to produce large yields of high quality corn in the lower Mississippi River Valley. Once you have decided to grow corn the next step is hybrid selection. There are a number of sources of information to help you but, two things to keep in mind: 1). All seed companies that sell in your area have adapted hybrids. If they don't they won't be in business long. 2). Every state conducts corn hybrid yield trials through the state Agriculture Experiment Station and that information is available, usually at no cost, through your local University Extension Service Office. A sizeable number of genetically enhanced hybrids are now available, i.e. Bt's, Roundup Ready, Liberty Link and such,

which yield well but are more expensive and must be managed well to achieve the desired benefits.

Research by the USDA-ARS at Stoneville, MS has shown that a number of corn hybrids that mature between 110-115 days after planting produce very high yields in the Mississippi Delta. Later maturing corns, 116-120 days, for a long time were the only type recommended for the lower Mississippi River Valley strictly because of its long growing season. But splitting your acreage between earlier maturing types with full-season hybrids can spread out your harvests and avoid some of the problems associated with your crop maturing all at once.

Planting dates with corn have become very early, not just in the Mid South, but for the entire USA. Recent research out of Wisconsin has determined that basically corn is being planted about 2 weeks earlier now than it was 30 years ago. For the Mid South, recently published research by the USDA-ARS at Stoneville, MS has determined the ideal date for corn planting in the Mississippi Delta is still around April 15-25. However, most of the corn in this region is being planted much earlier. Nearly 75% of this year's crop was planted by April 5, 2007. Planting as early as March 15, has been shown to have little or no negative affect on yield. However, after April 30, yields plummet. Late planting appears to result in a reduction of about 1 bushel per day for each day of delay after April 30.

Fertility is naturally an important management decision. Nitrogen is vital to a good yield. Contrary to some state recommendations on nitrogen, splitting the application does not appear necessary to achieve the desired yield goal. This is based on several experiments completed by the USDA-ARS at Stoneville, MS. Reductions in risks of nitrogen loss due to leaching or denitrification were the primary reasons for splitting the application. But, current diesel costs make it necessary to hold down the number of trips you make across the field and a missed side-dressing of nitrogen due to wet weather or lack of time to make the application will result in a substantial yield loss.

Weed control has been revolutionized with the advent of Roundup Ready and Liberty Link hybrids. Despite the fact these herbicides kill a number of troublesome weeds that some of the older pre-emergence compounds would miss, it is still advisable to make an application of these pre-emergence herbicides to give residual control that Roundup or Liberty cannot deliver. Also, avoid getting hooked on Roundup as your only herbicide. In some fields that have had a succession of Roundup ready crops grown on the land, Roundup resistant weed biotypes have begun to appear.

Bt hybrids have been a big help in reducing losses from Southwestern cornborer and corn earworm. However, growers must follow guidelines regarding the acreage of Bt crops grown per farm, especially if Bt cotton is including as part of the cropping program. Also, several southern states are reporting that the benefit of Bt hybrids comes primarily with later planted corn crops. Little benefit from Bt genetics appears to be realized with early planted corn.

The ability to irrigate most of our corn is one of the big advantages we have in the Mississippi River Valley over a lot of the Midwestern states. Granted there is a lot of irrigated corn grown in the Corn Belt, but there is a sizable acreage that cannot be irrigated because of the lack of a water source and/or the topography. Corn is a thirsty plant. It takes about 750,000 to 1,000,000 gallons of water per acre to grow 175 bushels of grain. Irrigation has become expensive because of fuel prices but it can nearly double grain yields over non-irrigated crops grown on similar soils.

Harvesting is as important an operation in corn production as any in the system. Picking needs to be done in a timely manner to reduce potential losses to weather, lodging, dropped ears or insects and maximize profits. Virtually all corn produced in the lower Mississippi River Valley is field dried. In the Mid South grain driers are few and far between and will likely remain that way due to current energy prices. Our corn matures during dry hot weather and can reach 15.5% moisture rather quick. It is important to monitor grain in the field closely and begin picking at 15.5% to reduce losses due to kernel breakage and a lack of moisture. Combines need to be properly set and monitored to avoid losses due to over-throw. Grain that isn't marketed immediately is being

stored on farm. A sizeable amount of this year's production went into temporary storage using plastic bags. If grain is stored this way it is important to monitor it daily for tears and leaks. Metal bins will need to be thoroughly cleaned before storing next year's crop.

Corn Hybrid Development, Testing And Selection For The South – A Pioneer® Perspective

Presented by Randy Hegwer
Research Scientist, Pioneer Hi-Bred International Inc.

Corn hybrid customer needs vary greatly from one region to another, from one grower to anotherand one field to the next. However, the one constant around the world is the expectation that corn hybrids yield in the customers environments. The south is different from the Corn Belt in regards to acreage density, rotation options, soil types, abiotic and biotic pressures, weather patterns, anda host of other conditions. In order to minimize production risk for the southern corn grower Pioneer® continues to breed unique genetics, evaluate inbred and hybrid performance across many locations and years, as well as understand response to environmental variability throughout the south.

Since corn is a cross-pollinated plant it is important to first develop adequate female and male parents (inbreds). It is also important to offer diverse genetic backgrounds. Pioneer has the unique ability to explore its entire corn inbred library to look for genetic diversity. Today's southern inbreds are compared to their ancestral founders tracing back over 70 years of breeding to see phenotype to gene association. Diversity gaps are shored up utilizing genetic segments from other inbreds, such as from internal Corn Belt and international breeding programs.The southern breeding teams also utilize enabling technologies, such as molecular breeding and doubled haploids, to improve breeding efficiency and effectiveness.

Once genetically diverse inbreds are developed and identified as potential southern utility then the second major challenge begins with identification of the best-inbred combinations for south hybrid development. The south hybrid testing process typically takes seven years of evaluation from the first year it is tested in hybrid combination until recommended for commercialization. Thousands of new potential hybrids are screened, but only 1/3 of 1 percent will ever make it commercial status. The first couple of years involve "topcross" testing to determine the value and utility of inbreds as they are created via the inbred discovery process. Once south inbreds are created, they are validated over the next couple of years in small plot research in the R1 and R2 testing stages. At R1 and R2 these inbreds, and respective hybrids, are subjected to targeted non-yield trait screening observation sites. The southern sites include the following targeted traits: Southern leaf blight, Northern leaf blight, Southern rust, Gray leaf spot, Fusarium ear rot, Diplodia ear rot, Anthracnose stalk rot, plant population, ear flex, artificialinduced stalk and root strength,drought stress and hybrid by herbicide class sensitivity response. Other agronomic traits such asstay green, brittle snap, test weight, plant stature, husk cover, etc.are measured within the yield tests beginning at R1 stage. Additional targeted traits are measured in sites outside the south. From these southern sites the trait characteristic chart scores are assigned for positioningpurposes. The R3 testing stage (year 5) samples additional environments within the south geography and also extends outside the areato determine adaptation. The R4 stage (year 6) continues to expand the testing area with continued small plot research plus the addition of large plot side-by-side strip testing by the sales and agronomy teams. Hybrids that advance from R4 stage are commercialized to R5 for limited sales introduction. A typical experimental hybrid would get yield tested in approximately 350 unique locations during R1 through R4 stage. R5 stage testing (year 7) repeats the R4 stage level with both research small plot and sales strips.