**Program 1CR-2**

# Management Of Insect Pests Of Corn In The Mid-South To Maximize Yield

**Presented by Dr. Angus Catchot**
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Since 2006 cotton acres have been on a steady decline in the Mid-South region of the United States and as a result many producers have switched to corn and soybeans in these areas. In the last decade there have been numerous advances in insect management strategies in field corn from insecticidal seed treatments to pyramided genes placed in corn hybrids that control above and below ground insect pests.

With a "new" emphasis on highly managed field corn in the southern region, most acres are now scouted weekly by independent crop consultants and treated as needed for insect pests. Some of the yield advances we have seen in recent years are a direct result of better insect pest management decisions. Also, growers have to be better informed since decisions on traits and seed treatments are often made well in advance of planting.

This paper will provide new data on some of the most commonly found insect pest of field corn in the southern region and provide control recommendations for these pest to help producers maximize profits.

**Program 3CR-2**

# Profitable Corn Production - Nutrient Management And Cultural Practices

**Presented by Dr. M. Wayne Ebelhar**
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Grain crop production in the Mid-south and Southeast has continued to increase with greater acreage planted to corn. Mississippi production in 2012 harvested 800,000 acres with an average record yield of 156 bu/acre. Recent increases in corn and soybean prices, to record levels, will continue to result in shifts from cotton and rice to corn and soybean. Soybean production in 2012 also produced record yields (42 bu/acre) on 1.96 million acres. While corn production is not new to the South, many technologies are changing and the profitability of corn has reached new highs due predominantly to higher yields. Cultural practices such as planting date, cultivar selection, row configuration, and irrigation are extremely important in today=s production systems. Nutrient management, especially nitrogen (N), phosphorus (P), potassium (K), and sulfur (S) continues as a primary consideration in corn production. Nearly twice as much N is needed in corn production as compared to cotton. Fertilizer prices reached all-time highs a few years ago and still remain high. Efficient fertilizer utilization results in higher yields with less losses to the environment. Higher yielding soybean and corn result in more nutrient removal from production fields and a greater dependence on fertilizer to maintain productivity. Possible biomass removal for bio-energy could also lead to additional nutrient removal. Primary emphasis for this presentation will be planting date effects, single-row vs twin-row production (N rates and seeding rates), and the interaction of cultivars and N rates for twin-row production systems.

The effects of planting dates on corn production has been evaluated for the past four years at the Delta Research and Extension Center. Two cultivars and two N rates were used at each

planting date. The first planting date was early March and continued on a 2-week intervals until mid to late April. Cultivar differences were evident as expected in most years and also a significant response to N rate. In the first year of the study there was no grain yield difference with respect to planting date. However, in subsequent years, the latest planting (April 20 and later depending on the year) resulted in significantly lower yields. Ear heights and other ear characteristics have also been examined. As the planting date moves from early March to late April, the ear height tends to increase. Subsequently, as ear height on the plant increases, the potential for lodging is also increased. Ear characteristics are still being summarized and will be presented as the information becomes available.

Twin-row corn production has been utilized by grain producers in the Mississippi Delta for several years with significant yield responses obtained with increased seeding rates and higher nitrogen (N) applications. Twin-row (TR) planting and single-row (SR) planting on wide rows (40-in) have been evaluated in a multi-year project that was initiated in 2009 to evaluate four N rates (140, 180, 220, and 260 lb N/acre) and four seeding rates (25,000 to 40,000 seeds/acre). The study was planted on Bosket very fine sandy loam (Mollic hapludalfs), following soybean, with a Monosem twin-row vacuum planter and a John Deere 7300 vacuum planter. Uniform preplant N (100 lb N/acre) was applied as urea-ammonium nitrate solution (32% N) with the actual N rates established at the time of sidedress N application. In 2009 grain yields ranged from 183 to 220 bu/acre with the lowest yield observed at the 140 lb N/acre rate and the lowest seeding rate. The highest yields were obtained with 220 lb N/acre and a seeding rate of 40,000 plants/acre. The yield increases from TR planting ranged from -4.4% to +16.8%. In general, the TR system had 3% higher yields when averaged across all seeding rates and N rates in 2009. The study was rotated to an adjacent field and followed soybean in 2010. There was no difference between the SR and TR systems when averaged across N rates and seeding rates. The optimum planting rate was near 40,000 plants/acre with no response to N rates above 180 lb N/acre. The study was rotated to the original location and again followed soybean in 2011 with similar results as previous years. One limiting factor appears to be irrigation and/or rainfall. With the TR system, irrigation is required for each row with initiation early enough to insure good pollination. Yields from 2012 were the highest from the study as weather conditions and timely irrigation greatly impacted production.

Since twin-row production has been adopted, research has been underway to evaluate cultivar differences at various seeding rates in the TR production system. Research has been conducted in large-scale plots on producer fields. The initial study found significant increases with both increasing N rates and increasing seeding rates. However, even though the response to increasing N was significant, the practice was not economical as the increased yields did not pay for additional fertilizer N. Increasing seeding rates resulted in increased profitability. The second step in the evaluation process has been to examine selected cultivars at the different seeding rates while holding the N rates constant. There have been significant differences each year depending on some of the flex characteristics of the cultivar. Some cultivars respond better than others as the seeding rate is increased. These studies are managed by the producer throughout the growing season including N applications, pest control and irrigation.

The third phase of the project has been to evaluate the various selected cultivars with respect to N management. These studies have involved N rates management with the TR production system and a constant seeding rate. This project was initiated in 2011 and expanded in 2012. All studies are maintained in producer fields with only the N component managed by the scientist. Nitrogen rates ranged from 120 lb N/acre up to 270 lb N/acre in 30-lb increments. Either 60 or 120 lb N/acre was applied soon after planting with the remaining N applied as a sidedress application at the V5-V6 growth stage. Excellent yields were evident in 2012 with the research to continue in the future. Preliminary research has shown that the shorter season corn cultivars are less responsive to N yet have the highest grain yields at the lower N rates as compared to fuller season cultivars. All of the above inputs are important for optimum corn production in the Mid-South region.