annual bluegrass, Carolina foxtail and other cool season species emerge often providing a cover that appears to have been planted.
In 2002 a revolutionary technology called Clearfield was introduced to commercial rice production. It provided an ability to control red rice with herbicides which meant growers would no longer have to use water seeding. Drill seeding and broadcast seeding followed this introduction which also opened the door to no-till and reduced tillage rice production. Without Clearfield rice varieties it is unlikely that dry seeding would have ever increased significantly thus no-till and reduced tillage production would not have been adopted in rice production in Louisiana.
In 2002 only 3% of rice acres in Louisiana were planted to Clearfield varieties. Two years later that figure had increased to 23%. As the varieties improved and growers experimented with the technology the acreage increased. Surveys of the 2010 crop indicate a little over 70% of Louisiana rice acres were planted to Clearfield rice.
Unfortunately, no formal surveys comparing water seeding to dry seeding were conducted over that same time span. Most experts agree in south Louisiana at least 80% of rice was water seeded prior to the introduction of Clearfield technology. In northeast Louisiana where red rice was not yet as serious it was the opposite with at least 95% of the rice dry seeded in that region of the state.
The first formal data on water seeding versus dry seeding was generated in 1998. At that time only 44% of the acreage in the state was dry seeded. Surveys from 2010 show 68% of rice planted state wide is now dry seeded with the bulk of that being drill seeded.
Correspondingly all forms of reduced tillage acreage increased as the adoption of Clearfield technology progressed. In 1998 only 4% of Louisiana's rice acreage was in true no-till production with a total of all reduced tillage forms adding up to 17%. The introduction of Clearfield rice in 2002 resulted in a dramatic increase in reduced tillage acreage to nearly 30%. The acres devoted to reduced tillage is influenced by weather especially for those who prefer a fall stale seedbed so some fluctuation in acreage has occurred. Overall the adoption of reduced tillage practices has shown a steady increase to the 2010 level of almost 43% of rice being planted in this manner. True no-till acres have doubled to a little over 9% with stale seedbed making up the remainder.
In the beginning reduced tillage systems were practiced by the "experimenters". It was considered risky and difficult. Today reduced tillage is a common practice being utilized by nearly all rice farmers to some degree. True no-till is gradually gaining acceptance as better equipment and cultural practices are perfected. This trend is expected to continue well into the future.

Program 7R-2

▸ Rice Seed Treatments For Insect Management

Presented by Dr. M.O. Way
Professor of Entomology, Texas A&M University

Insecticidal rice seed treatments for control of an array of insect pests are excellent new tools for our farmers, especially in conservation tillage systems where vigorous rice plant stands are essential to successful production. Also, most farmers are decreasing their seeding rates due to the higher cost of seed and reduced recommended seeding rates of new varieties such as the hybrids. So, protection of this seed, afforded by the new insecticidal seed treatments, is a viable option for our rice farmers.
Currently, 2 insecticidal rice seed treatments are labeled---Dermacor X-100 and CruiserMaxx. Both provide excellent control of the rice water weevil (RWW). Dermacor X-100 also controls fall armyworm, South American rice miner and stalk borers while CruiserMaxx controls grape colaspis, aphids, thrips, chinch bug and other early season pests with piercing-sucking mouthparts. In addition, CruiserMaxx possesses 3 fungicides to protect seed against seedling diseases. A third insecticidal seed treatment, Nipsit INSIDE, is projected to gain a rice label within the next 2 years. Nipsit INSIDE was granted an EUP in the

southern rice-producing states for the 2011 growing season. Our data show Nipsit INSIDE provides excellent control of RWW.

In 2010, all 3 seed treatments were evaluated for RWW control at the Texas AgriLife Research and Extension Center at Beaumont. All experiments were designed as a randomized complete block with 4 replications. Plot size was 18 ft X 7 rows, 7 inches between rows. Each plot was surrounded by a metal barrier. Seed was treated and plots drill-planted followed by flushing until 3 weeks after rice emergence when a flood was applied. At about 3 and 4 1/2 weeks after flood (this is when RWW populations are the highest during the season), 5, 4 inch diameter X 4 inch deep mud cores from each plot were removed and processed for RWW larvae and pupae. Each core contained at least 1 rice plant including roots. At maturity, plots were harvested to obtain yields.

In a planting rate study with Dermacor X-100 applied to Cocodrie seed at 1.75 fl oz/cwt, RWW control in plots planted at 60, 90 and 120 lb/A was excellent with yield increases of 888, 993 and 1100 lb/A, respectively. In another planting rate study, Cruiser 5FS, which is the insecticidal component of CruiserMaxx, was applied to Cocodrie seed at 3.3 fl oz/cwt followed by planting at 25, 50 and 75 lb/A. RWW control was 81, 91 and 95%, respectively. Yield increases were 616, 876 and 807 lb/A, respectively. In a third study, Nipsit INSIDE applied at 1.9 and 3.3 fl oz/cwt Cocodrie seed planted at 80 lb/A, provided 98% control of RWW with yield increases of 684 and 1048 lb/A, respectively.

These data show the importance of controlling RWW. Some farmers do not opt to control RWW because the above-ground damage is often difficult to observe. Insecticidal seed treatments are effective and farmer-friendly.

Program 10R-2

Unraveling The Basis For The Yield Performance Of Rice Hybrid And Inbred Varieties

Presented by Dr. L. Ted Wilson
Professor & Center Director, Texas A&M Univeristy

Experiments were initiated in 2007 to determine why hybrid rice varieties on-average produce higher yields than inbred varieties. These studies specifically focus on determining whether the yield advantage of commercial hybrids is due to hybrids having a greater ability to produce photosynthates or due to hybrids having a greater growth potential. A greater photosynthesis capacity can occur due to four factors: 1) the leaf canopy of hybrids develop more quickly and as a result intercepts a greater amount of light early in the season, 2) hybrids intercept light more efficiently due to subtle differences in the orientation of tillers and leaves within the canopy, 3) a greater photosynthesis rate is due to hybrids experiencing less photosynthesis feedback inhibition as a result of a greater demand for metabolites by developing tillers and associated organs, and 4) hybrids having an intrinsically greater photosynthesis rate per unit area of leaf surface. The first three factors can be explained by difference in rates of tiller and leaf production and growth. In contrast, the fourth factor would imply that hybrids possess greater variability in the metabolic pathways that control photosynthesis.

During the last four years of our study, we have measured for a number of inbred and hybrid varieties light capture, photosynthesis, seasonal growth, development, and yield, and the seasonal allocation of nitrogen and total non-structural carbohydrates (TNC) to each part of the plant. Measuring the amount of nitrogen, particularly in the leaf tissue, is important due to nitrogen playing a fundamental role in a photosynthesis. The greater the amount of nitrogen in a leaf, normally the higher the rate of photosynthesis. Measuring TNC levels is important due to TNCs fueling grow and development and providing a direct measure of a plant's health.

For 2007, our research focused on studying four commercial inbreds varieties and four commercial hybrids. For 2008 through 2010, we have studied a number of inbreds and hybrid offspring that we produced using the cytoplasmic 3-line breeding system, which is the system