

TEXAS A&M PLANT BREEDING

July 2009



The Department of Soil and Crop Sciences at Texas A&M University has been in the forefront of bioenergy crop development with major research grants from Chevron and CERES, as well as others. Dr. Bill Rooney leads a program developing sorghum as a bioenergy crop. Research into the use of sorghum as an energy crop was reinitiated in 2001, at which time they were only a minor interests. Today, the bioenergy research program occupies about 70% of Bill's research and breeding efforts.

Bill devotes his research time to three broad categories of activities: [1] research into the genetics of important traits such as grain and biomass yield, and quality components, [2] development of improved germplasm lines and inbred lines for hybrid production, and [3] training of graduate students to carry on the important work of genetically modifying plants for the benefit of mankind. Collaborations with other scientists, ranging from agronomy to biochemistry are essential to the success of the program. Especially important are the interactions with molecular genetics, which provide the basis for his marker-assisted breeding program.

Bill has released over 20 seed parent (A/B) and pollinator (R) lines during the past 10 years, many of which have been used by private plant breeders to develop grain and forage sorghum hybrids for the sorghum producing regions of the United States as well as international markets. Bioenergy sorghum hybrids are expected to be commercialized in the near future and many of these will be derived from this Texas AgriLife Research breeding program.

A unique area of research in Bill's program involves collaborative research in interspecific hybridization that involves crossing parents from different genera and species. This involves the crossing of a specific sorghum line, designated as Tx3361 with other grass species. Tx3361 has the unique ability to accept pollination and fertilization from non-Sorghum species, for example sugarcane, and produce viable offspring. These hybrids have potential use as either new crops or a base from which to move traits of interest from one species to another. "We're enjoying the challenge of working out the genetics of this phenomenon and investigating its potential in developing non-flowering bioenergy or other useful interspecific crops." This work is an example of the collaborative spirit of Bill and his program as it involves faculty and graduate students from four different programs, including cytogenetics and molecular genetics.



Nine graduate students currently are being directed by Dr. Rooney, four M.S. candidates and five Ph.D. candidates. These students are involved in such activities as pollen tube growth in interspecific hybrids, heterosis in black sorghums (important in antioxidant levels), and sugar content and its genetics in bioenergy sorghums.

Bill manages one of the largest plant breeding programs at Texas A&M AgriLife Research and still manages to be engaged in his kid's 4-H and FFA activities. His kids have shown and placed in competition with poultry locally and in Houston, San Antonio, and Austin. Will, a recent graduate of

A&M Consolidated High School, won the Texas FFA Zoology Agriscience Fair and placed second at the national competition in 2008.

You can find more information about Dr. Rooney's program and other plant breeding activities at (http://soilcrop.tamu.edu/research/breeding/crop_release.html). Please direct comments concerning this bulletin to Wayne Smith, cwsmith@tamu.edu or 979.845.3450.

 **Video by Dr. Bill Rooney, click to play** 

For the high quality version go to <http://soilcrop.tamu.edu/research/breeding/bulletin/rooney.wmv>