AgriLIFE RESEARCH & EXTENSION
Texas A&M System

TEXAS A&M UNIVERSITY

COLLEGE OF AGRICULTURE
AND LIFE SCIENCES

Department of Soil and Crop Sciences
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The idea of regenerative agriculture is not new but it may be receiving new attention. The idea that agriculture should be self sustaining is obvious, that being that we cannot consume the land, the water, and the genetics that feed us, cloth us, and provide for our aesthetic enjoyment. Modern agriculture has led to tremendous increases in productivity that has allowed the world's population to double in the past 50 years while allowing for more land areas to be set aside in national parks or protected acreage. Today, the agricultural industry is being asked to look to new frontiers, i.e., producing renewable energy to replace a finite supply of fossil fuel, while increasing food, feed, fiber, and aesthetic crop production.

The U.S. government has mandated the annual production of 36,000,000,000 gallons of "advanced biofuels" by 2022 with the caveat that only 15,000,000,000 gallons of that annual production could be corn grain based. With the work of graduate students such as Kyle Whitmire, the remaining 21,000,000,000 gallons per year could come from lignocellulosic biomass from the same genus as a long standing, traditional Texas crop, sorghum. Kyle has just completed his M.S. work investigating the potential of developing interspecific hybrids of *S. bicolor*, grain sorghum, and *S. halepense*, johnsongrass, for bioenergy and forage production in Texas.

***Sorghum* species have been utilized worldwide for the production of grain, forage, and recently as bioenergy resources. *Sorghum bicolor* is the 5th most important grain crop in the world in terms of production with the grain primarily used for human consumption throughout Asia, Africa, and Central America and for animal feed in the US, Australia,**

and South America. A subspecies of grain sorghum, *drummondii*, common name sudangrass, and hybrids of grain sorghum and sudangrass have been used for forage and hay in the U.S. for decades.

Although the vast majority all previous studies concerning *Sorghum* species for bioenergy feedstocks were conducted using the annual species, *S. bicolor*, a perennial grass production system offers ecological and environmental benefits not present in annual row crop production. Benefits such as increased soil organic carbon (also referred to as carbon sequestration), reduced soil erosion, reduced inputs of fertilizer and herbicides, reduced runoff of nutrients and pesticides, and a higher energy return due to the reduction of production inputs are major components of regenerative agriculture.

Kyle noted that this bioenergy production system is some years away but its benefits are enticing. Taking into account the ecological/environmental and production benefits of a perennial production system, a high-biomass, perennial grass would be a valuable lignocellulosic ethanol source. Unfortunately most lignocellulosic ethanol production facilities are only at the pilot plant stage in the U.S. and the market is not expected to fully mature for at least 5 years. While the U.S. produced 88 million acres of corn in 2010, we have 588 million acres of rangeland and pasture land and another 61.5 million acres of hay land. The current market status and availability of abundant forage and hay acreage provides the opportunity for a perennial, high-biomass forage feedstock that may have multiple end uses and provide increased economic value to producers.

Kyle will receive his M.S. degree in August, 2011. His committee chair is Dr. Russell Jessup, Perennial Grass Breeder, Texas A&M University and Texas AgriLife Research. Kyle will be joining Pioneer Hi-Bred Seed Company at the Miami, MO Research Center as a Senior Research Associate. The position is responsible for coordinating breeding

activities at the research center and ensuring adequate production and distribution of doubled haploid lines to the appropriate maize breeders.

Kyle is originally from Durant, OK where his family raised cattle and produced peanuts and hay. He received his B.S. from Oklahoma State University in Plant and Soil Sciences in 2006. Before coming to Texas A&M Kyle held a Scientific Aid position in a small grains/soil fertility program with the University of Idaho for two years. He is married to Bethany Whitmire and they have two sons, Sam, 2 years old, and Corbin, 5 months. Kyle enjoys spending time with his family and outdoor activities such as fishing, hunting, and cycling.

Other News

Reminder: The 2011 NAPB annual meeting

will be held at College Station, Texas on the campus of Texas A&M University in 23 – 25 May 2011. Additional information on the 2011 meeting can be found at http://www.plantbreeding.org/napb/Meetings/pbccmeeting2011.html.

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