



# **SORGHUM CHECKOFF**

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## **Research Approvals 2010**

### **Identification of Ma1, the gene that hinders utilization of exotic sorghum germplasm**

Lead PI: Andrew Patterson - University of Georgia

This project aims to identify and develop markers for the genes that are responsible for photo periodism in sorghum. This allows for a more rapid conversion of exotic sorghum germplasm, that will not flower in the U.S., into a useful germplasm that can be researched and utilized in the U.S.

### **Gene Discovery for Sorghum Responses to Nitrogen**

Lead PI: Ismail Dweikat - University of Nebraska - Lincoln

This project will develop strategies and methods to enhance the ability of grain sorghum to utilize nitrogen more efficiently. Genes controlling nitrogen efficiency will be identified.

### **Identifying and Developing new drought tolerant sorghum germplasm**

Lead PI: John Burke - USDA-ARS

Post-flowering drought tolerance is an essential trait for increasing the production of sorghum in variable climates. New methods of identifying these traits will greatly reduce the selection time needed to identify drought tolerant sorghum. While continuing to identify germplasm with improved drought tolerance.

### **Study of genetic and physiological characteristics associated with improved nitrogen use efficiency and drought tolerance in sorghum**

Lead PI: Tesfaye Tesso - Kansas State University

This project will evaluate a range of sorghum genotypes including sources known for their pre-and post-flowering drought tolerance, stalk rot resistance and yield potential.

### **Development of forage sorghum tissue testing for efficient fertilization**

Lead PI: Michael Ottman - University of Arizona

Sorghum silage has become a popular crop because it requires less fertilizer than corn silage. However, fertilizer guidelines have not been available for forage sorghum in the desert southwest. This project will develop these guidelines by conducting a nitrogen fertilizer rate study in Maricopa, Ariz. This research was conducted in 2009 and will continue in the second year of work. Their ability to utilize nitrogen will be compared, tests for nitrogen efficiency will be developed.

### **Update Publication on Growth, Development, and Nutrient Uptake of Sorghum**

Lead PI: Kraig Roozeboom - Kansas State University

Significant changes in sorghum genetics and management practices and the need for high quality electronic images make it necessary to update a comprehensive publication on sorghum growth. This project will allow researchers to update this publication with current hybrids and new, high resolution electronic images for dissemination to producers, consultants, researchers, and extension agents.

### **Enhancing sorghum yield and profitability through efficient nitrogen management**

Lead PI: David Mengel - Kansas State University

This project proposes to systematically obtain information across a range of environments and develop a framework to incorporate that NUE information into the Kansas N recommendation system for modern sorghum hybrids.

### **Protein Adhesives from Sorghum DDGS**

Lead PI: Donghai Wang - Kansas State University

The goal of this research is to develop affordable, durable and biodegradable protein adhesives using low-cost sorghum DDGS to increase the profitability of ethanol production, reduce VOC emission and reduce reliance on fossil fuels.



### **Increase sorghum yield and acreage in mid-Atlantic region through acquisition of scientific knowledge related to biotic and abiotic factors affecting its yield and quality.**

Lead PI: Maria Balota - Virginia Tech

The goal of this project is to increase interest in sorghum in Virginia and North Carolina, and to hasten incorporation of sorghum into existing cropping systems, therefore enhancing the sorghum industry in that general region.

**Investigating automatic irrigation scheduling and quantifying water use efficiency and yield for limited and fully irrigated and early to late maturing grain sorghum.**

Lead PI: Susan O'Shaughnessy - USDA-ARS

This continuing research project will optimize automatic irrigation scheduling of deficit irrigated grain sorghum and research its impact on water use efficiency.

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**Continue Expanded Grain Sorghum Hybrid Testing – West Texas**

Lead PI: Calvin Trostle - Texas Agrilife

This project continues sorghum hybrid testing in West Texas by diversifying planting dates for the Vernon/Chillicothe area, Ballinger/San Angelo area, Lamesa, and Hockley County and looking at various maturities and their effect on yield in this region.

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**Identifying genetic and structural sources of stalk rot resistance in diverse sorghum germplasm under dryland production**

Lead PI: Christopher Little - Kansas State University

The goal of this project is to assess losses in sorghum seed weight and quality due to stalk rots in dryland production systems. This will be accomplished through the identification of drought tolerant germplasm possessing acceptable end of season yield parameter and lodging resistance after stalk inoculation with *Fusarium* spp. and charcoal rot.

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**Sequential Sampling and IPM Decision Aids for Headworm in Grain Sorghum**

Lead PI: Norman Elliott - USDA-ARS

Sampling for headworm in sorghum fields is a somewhat uncertain process today. Therefore, a producer makes a decision to treat the field with an unknown level of confidence as to whether the correct decision has been made or not. The product of this research will be a new, time efficient, sequential sampling technique for headworm in grain sorghum for use by producers, crop consultants, and IPM specialists in Texas, Oklahoma, and Kansas.

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**Plant Management Impact on Sweet Sorghum as a Biofuel Crop**

Lead PI: Kun-Jun Han - Louisiana State University

This study combines field research and advanced sugar analysis technology. Data related to sweet sorghum parameter such as yield, maturity, stalk leaf ration and seedhead yield will be collected at research units in both northeast and southeast Louisiana.

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**For more information contact**

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**Potential Sources of Ergot Resistance**

Lead PI: Clint Magill - Texas A&M University

The emergence of the disease ergot in the US over the past decade has created problems for both the sorghum seed industry and producers. Although *Claviceps africana*, the causal organism does not produce toxins like some ergots, infection does reduce yields and the syrupy honeydew that it produces can clog combines. The main thrust of this project is to evaluate prospects for creating or enhancing resistance to *C. africana* by manipulating host defense responses. **Above:** Ergot infected sorghum.

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**Stabilization of Sweet Sorghum Juice for Year-Round Use**

Lead PI: Donghai Wang - Kansas State University

The goal of this research is to develop affordable processing techniques to extend the storage stability of sweet sorghum juice. This will allow sweet sorghum based ethanol facilities to run year around rather than on a seasonal operation.

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**Fibrolytic Enzymes to Enhance the Use of Sorghum Silage for Lignocellulosic Feedstock**

Lead PI: Jamie Foster - Texas Agrilife

The goal of this project is to identify the effect of management practices, including environment, cultivar, whole plant versus dual crop, and post-harvest fibrolytic enzyme applications on the use of sorghum silage as a pretreated biomass feedstock for lignocellulosic conversion technologies.

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