2014 Mid-South Soybean Board

Member Projects by Board Detail

Arkansas Soybean Promotion Board

Project: Defining potassium nutritional requirements for soybean with indeterminate growth habit **Amount:** $39,000

Investigator: Slaton, Nathan **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Soil

Goals: Previous research has shown trifoliate leaf K concentration at the R1-R2 growth stage to be highly correlated with yield and soil test K for soybean varieties with a determinate growth habit (Maturity Group 5, MG5), but not for indeterminate varieties (MG4). Tissue K concentrations of MG4 varieties at the R2 stage is often lower than the 1.5-1.8% threshold defining low and deficient leaf K concentrations. Our mission is to determine a specific growth stage, critical leaf K concentration, and sampling protocol for indeterminate varieties that is highly correlated with soybean yield potential. We believe the problem with the current critical leaf K concentration is that indeterminate varieties can be in the R2 growth stage for a long period and that K is allocated differently in these plants when compared to determinate varieties. Improved diagnostics for interpreting leaf K of indeterminate soybeans would enable Arkansas farmers to confidently asses and manage in-season soybean K nutrition. The specific goals in this project are to evaluate early MG IV, mid or late MG IV, and MG V soybean cultivars to improve our ability to accurately interpret leaf tissue analysis of indeterminate soybean varieties.

Project: Plant, soil, and weather based cues for irrigation timing in soybean production **Amount:** $25,000

Investigator: Reba, Michelle **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Water

Goals: Compare the yield and pest response to irrigation timing in a clay and sand dominated soils

Project: Developing cultural management practices for winter cover crops to improve soybean performance and yield in the full season soybean production system **Amount:** $66,000

Investigator: Roberts, Trent **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / OtherManagement

Goals: To develop cultural management guidelines for winter cover crops including establishment, fertilization and residue management and to identify the specific factors that aid in soybean growth and yield.

Project: Investigating emerging production recommendations for sustainable soybean production in all soybean production system **Amount:** $125,000

Investigator: Ross, Jeremy **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / OtherManagement

Goals: To investigate new and untested management inputs to improve soybean production across all of the Arkansas Soybean Production System.

Project: Integration of brassica winter cover crops into soybean production systems for the suppression of nematodes and other soilborne diseases **Amount:** $25,000

Investigator: Rothrock, Craig **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Nematode / OtherNematode

Goals: To improve the management of nematodes and soilborne diseases of soybean by integration of brassica winter cover crops in the soybean production system.

Arkansas Soybean Promotion Board

Project: A team approach to weed management in soybean **Amount:** $229,000

Investigator: Scott, Bob **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Weed / HerbResistance

Goals: The overall goal of this project is to evaluate new and emerging technologies, rapidly identify herbicide-resistant weeds, determine their distribution, determine their mechanisms of resistance, and develop viable solutions for managing herbicide-resistant weeds, reducing the soil weed seed bank and controlling other problematic weeds for Arkansas full season soybean producers. In addition efforts will be made to utilize full season production methods to aid in reducing the overall soil weed seed bank. A major goal will be providing a rapid information exchange between the grower, extension personnel, and researchers.

Project: Fertilization of soybean **Amount:** $70,000

Investigator: Slaton, Nathan **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Soil

Goals: The overall research mission is to identify potential yield limitations via soil and plant analysis and prevent soybean yield losses attributed to insufficient (or toxic) mineral nutrition. The specific goals addressed with this project are to 1) evaluate the benefit of foliar-applied solutions that claim to enhance soybean yield, 2) continue to evaluate phosphorus (P) and potassium (K) fertilization strategies, soil test methods and plant analysis that aid in identifying deficient soils and/or maximize yield potential and economic returns, and 3) develop a leaf tissue Cl concentration that can be used to diagnose Cl toxicity.

Project: Understanding Neocosmospora, Thielaviopsis and Fusarium Virguliforme in early season production systems **Amount:** $59,000

Investigator: Spurlock, Terry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Disease / OtherDisease

Goals: Improving soybean profitability. Direct value since the findings from this project could have a noteworthy positive economic effect on production cost by increasing yields and lowering production costs.

Project: Foliar disease management in full and double crop soybean production systems in Arkansas **Amount:** $36,000

Investigator: Spurlock, Terry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Disease / OtherDisease

Goals: Improving soybean profitability by determining appropriate timing and fungicide combination to control foliar diseases of soybean. This will have direct value to the producer by improving their ability manage foliar diseases efficiently, economically, and effectively.

Project: Soybean research verification program **Amount:** $90,000

Investigator: Ross, Jeremy **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: To verify University of Arkansas, Division of Agriculture recommendation for soybean production, and to maintain an economic data base of production practices on a large scale field basis

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Arkansas Soybean Promotion Board

Project: Improving yield and yield stability for irrigated soybeans **Amount:** $151,000

Investigator: Henry, Chris **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Water

Goals: This project is a continuation of an ongoing effort to improve yield and yield stability for irrigated soybeans in Arkansas. Coordination of past and present projects are needed for a better understanding of the soil-plant-water relationship necessary for continued improvements in yield and yield stability of irrigated soybean

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Project: Breeding new soybean cultivars with high yield and disease **Amount:** $200,000

Investigator: Chen, Pengyin **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Genetic

Goals:

Project: Characteristics of maximum yield soybean fields **Amount:** $79,000

Investigator: Purcell, Larry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Variety

Goals: The Arkansas Soybean Promotion Board together with the Arkansas Soybean Association have established two programs to recognize farmers who produce high yields. The “Race for 100” was a one-time program to recognize a producer with documented yields of 100 bu/acre or more. The $50,000 prize money for this program went unclaimed for several years, but in 2013, three producers who entered the contest had yields exceeding 100 bu/acre. The second program, “Grow for the Green”, is also a yield contest but has eight categories. Seven of the categories are geographic divisions within the state, and one category is a state-wide contest reserved for a non-GMO variety. Within each of these eight categories, cash prizes of $10,000, $7500, and $5000 are awarded for 1st, 2nd, and 3rd places. The goal of the research outlined in this proposal is to determine the soil physical and chemical properties that are a prerequisite for having exceptionally high yields (90+ bu/acre). This understanding will allow producers to assess the properties in their own fields that may limit productivity.

Project: Industrial CLA-rich soy oil production and marketing through a Division of Agriculture-Riceland Foods research collaboration **Amount:** $50,000

Investigator: Proctor, Andy **Organization:** University of Arkansas System's Division of Agriculture **Category:** Utilization / Oil / EdibleOil

Goals: The goal is to commercialize conjugated linoleic acid (CLA)-rich oil production technology by developing industrial production and food product development, through university-industry research collaboration.

Project: Fire ant control in soybean **Amount:** $11,000

Investigator: Lorenz, Gus **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Insect / OtherInsect

Goals: Determine impact of fire ants in the soybean agro-ecosystem and to include impact on pest and beneficial insects, harvest and subsequent yield

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Arkansas Soybean Promotion Board

Project: The Arkansas Discovery Farm program **Amount:** $17,000

Investigator: Daniels, Mike **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Sustainability

Goals: The Arkansas Discovery Farm program strives to document sustainable and viable row crop farming systems on real, working farms that promote agricultural profitability and natural resource protection.

Project: Using spatial distribution and time of colonization of Rhizoctonia solani **Amount:** $42,000

Investigator: Rothrock, Craig **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Disease / OtherDisease

Goals: To improve the management of aerial blight on soybean by using a predictive system for anticipating disease development

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Project: Broad-range approaches to determining salt tolerance in Arkansas soybean varieties **Amount:** $67,000

Investigator: Korth, Ken **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / OtherBreeding

Goals: Salt and drought damage to soybeans in Arkansas continue to be important problems. Our overall goal is to develop soybean breeding materials that will result in selection of existing varieties, and/or development of new varieties, with enhanced tolerance to environmental stress such as chloride toxicity.

Project: Developing profitable irrigated rotational cropping systems for Arkansas and mid-south **Amount:** $9,000

Investigator: Kelly, Jason **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Economic

Goals: Evaluate grain yields and resulting economic response for eight crop rotation sequences. Monitor how nematodes (Soybean Cyst, Root-knot and Reniform) and foliar diseases change over time based on crop rotation. Evaluate how soil nutrient levels, soil pH, and organic matter levels change over time due to crop rotation.

Project: Alternative winter crops for soybean double crop system **Amount:** $30,000

Investigator: Green, Steven **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / OtherManagement

Goals: To develop soybean double crop alternatives to winter wheat and identify yield limiting factors in 'white dirt' soils.

Project: Development of an effective program to manage strobilurin-resistant frogeye leaf spot in Arkansas **Amount:** $51,000

Investigator: Faske, Travis **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Disease / Cercospora

Goals: Develop practical management tactics to control strobilurin-resistant frogeye leaf spot and characterize traits in these fungicide-resistant pathogens that may increase disease incidence. Determine the potential of DMI- resistant development and develop guidelines to reduce the impact of fungicide-resistant diseases.

Arkansas Soybean Promotion Board

Project: Comprehensive disease screening of soybean varieties in Arkansas **Amount:** $132,000

Investigator: Kirkpatrick, Terry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Variety

Goals: To provide independent evaluation of new soybean cultivars for resistance to major diseases and nematodes. Our specific goal for 2014 is to contribute disease resistanceinformation in a timely manner so that the database will provide an effective method of delivering variety information to the public.

Project: Assessment of soybean varieties in Arkansas for sensitivity to chloride injury **Amount:** $32,000

Investigator: Green, Steven **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Soil

Goals: To perform chloride reaction screenings in soybean using the hydroponic and laboratory testing method developed by the late Dr. Darrel Widick.

Project: Soybean enterprise budgets and production economic analysis **Amount:** $19,000

Investigator: Flanders, Archie **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Economic

Goals: The goal of this project is to provide crop enterprise budgets for soybeans that are flexible for representing alternative production practices of Arkansas producers. Crop enterprise budgets are developed with methods that are consistent over all field crops.

Project: Sustaining water resources in mid-south soybean **Amount:** $40,000

Investigator: Daniels, Mike **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Water

Goals: The Arkansas Discovery Farm program will be utilized to document the impact of water management and irrigation on water quality and quantity as it relates to soybean production in Arkansas

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Project: Development of an on-line course - future of biotechnology crops **Amount:** $9,000

Investigator: Robinson, Julie **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: Develop and implement more advanced online course to teach the facts about biotechnology crops and future trends, using soybean as a model crop.

Project: A soybean nematode survey and education program for Arkansas **Amount:** $65,000

Investigator: Kirkpatrick, Terry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Nematode / OtherNematode

Goals: To increase the awareness among soybean growers of the presence and severity of nematodes on their farms, with particular emphasis on fields with histories of long cotton monoculture or corn production.

Arkansas Soybean Promotion Board

Project: Decadal effects of residue and water management practice alternatives on soybean yield and soil properties in a wheat-soybean double-crop production system **Amount:** $46,000

Investigator: Brye, Kris **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Soil

Goals: Enhancing the present quality and subsequent long-term sustainability of soybean-producing soils in the Mississippi River Delta region will be at the forefront of issues facing the soybean and other commodity industries in the near future as tighter environmental rules and regulations are enacted in an effort to improve water and air quality and further foster soil and water conservation. The adoption of conservation practices is a valuable investment in the future, ensuring that subsequent generations have productive lands to farm to feed ever -growing populations. Failure to promote, through research and education, the voluntary adoption of conservation practices could cause producers to be forced into changing their operations in the future for reasons they do not know or care about. Foreseeing these shifts will help ensure that Arkansas' and our nation's soybean producers are productive and competitive for many decades to come. Therefore, the goal of this proposed research project is to document long-term trends and improve the long-term sustainability of soybean production and soil resources in the Mississippi River Delta region of eastern Arkansas.

Project: Improving technology transfer for profitable and sustainable soybean production **Amount:** $20,000

Investigator: Ross, Jeremy **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: To ensure that improved production practices for soybean production in Arkansas are distributed in a timely manner.

Project: Integrated management of soybean nematodes in Arkansas **Amount:** $47,000

Investigator: Kirkpatrick, Terry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Nematode / OtherNematode

Goals: Our goals are as follows: 1) Determine the significance and potential risk of plant-parasitic nematodes in Arkansas soybeans. 2) To evaluate currently-existing methods for controlling nematodes in soybean, and to test newly emerging control technology and resistant cultivars. 3) To develop sustainable, economically feasible nematode management strategies for Arkansas producers.

Project: Validating soil-test based fertilizer recommendations for soybean **Amount:** $26,000

Investigator: Slaton, Nathan **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Soil

Goals: Research since 2004 has focused on developing databases to redefine soil-test based P and K recommendations for soybean. Soil testing procedures were updated in 2006 and required that soil test recommendations be changed too. Changes were based on a combination of philosophy and, what was at the time, preliminary research results. Meanwhile precision agriculture and its relation to crop fertilization practices has become the focal point of crop nutrition management programs. The proposed project is the research program for Matthew Fryer (Wynne, AR) who is started working on his Master of Science Degree Program in August 2013 and was the recipient of the 2013 ASPB Soybean Fellowship Program. The project is aimed at validating the accuracy of soil-test based fertilizer recommendations in regards to soybean yield response to P and K fertilization. The goal is to evaluate recommendations with new and unique data. Currently, recommendation probability is based on the research responses that have been used to build the actual database.

Arkansas Soybean Promotion Board

Project: Screening for soybean tolerance to metribuzin **Amount:** $16,000

Investigator: Norsworthy, Jason **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Weed / HerbResistance

Goals:

Project: Purification and production of pre-foundation seed of UA soybean lines **Amount:** $30,000

Investigator: Chen, Pengyin **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / OtherBreeding

Goals:

Project: Dissecting the epidemiology and resistance to soybean vein necrosis virus **Amount:** $80,000

Investigator: Tzanetakis, I.E. **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Disease / Virus

Goals: Minimize impact of Soybean vein necrosis and develop sustainable approaches to control the disease.

Project: Establishment of drought-tolerant soybean plants by genetic manipulation of ERECTA signaling **Amount:** $35,000

Investigator: Srivastava, Vibha **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Genetic

Goals: To modify ERECTA signaling in soybean for developing a new genetic source of drought tolerance.

Project: Flag the Technology **Amount:** $101,000

Investigator: Scott, Bob **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Weed / HerbApplication

Goals: To help growers, consultants, private applicators and commercial applicators prevent the unintentional spraying of soybean fields with the wrong herbicides and prevent problems with associate with drift. Another Goal of this proposal is to help the University of Arkansas County Extension Agent system promote the existing “Flag the Technology” program.

Project: Production and maintain high quality soybean seed in Arkansas and grower education **Amount:** $75,000

Investigator: Rupe, John **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Quality

Goals: To determine factors that impact seed production and soybean seed quality in Arkansas; and to educate Arkansas producers about seed quality and vigor testing.

Project: Developing a new threshold for corn earworm, Helicoverpa zea **Amount:** $26,000

Investigator: Lorenz, Gus **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Insect / OtherInsect

Goals: Develop a dynamic threshold for corn earworm (CEW) that takes into account the value of the crop, the cost of control and most importantly maintains profitability for the Double Crop Soybean Production System.

Arkansas Soybean Promotion Board

Project: Irrigation pumping plant efficiency **Amount:** $45,000

Investigator: Henry, Chris **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Water

Goals: The goal of this project is to study irrigation pumping plant cost and efficiency and to develop Extension resources for producers for making decisions about pumping plant operation and changes.

Project: Drought tolerance research - tagging drought tolerance genes using rapid screening methods **Amount:** $76,000

Investigator: Purcell, Larry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Genetic

Goals: To use previously developed/tested remote-sensing technologies along with a rapid screening methods for water use efficiency to identify genotypes that differ in drought tolerance. This will allow us to 'tag' the genes associated with these drought tolerance traits and eventually transfer those genes into elite varieties.

Project: Screening soybean germplasm and breeding soybeans for flood tolerance **Amount:** $46,000

Investigator: Chen, Pengyin **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / OtherBreeding

Goals: To improve soybean tolerance to waterlogging/flooding.

Project: Economics of multiple water-saving technologies across the Arkansas delta region **Amount:** $47,000

Investigator: Kovacs, Kent **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Water

Goals: Identify best irrigation management practices that can help soybean farmers in Arkansas adapt to increasing water shortage, rainfall variability and potential policy changes.

Project: Technological aids for information dissemination to soybean producers **Amount:** $13,000

Investigator: Saraswat, Dharmendra **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: This proposal aims to develop several smartphone based applications (short name "apps") and their associated backends (i.e. server side code) to disseminate the latest research-based information developed by the University of Arkansas Division of Agriculture to soybean producers, crop consultants and county agents.

Project: Increasing the soybean meal content of diets for largemouth bass by using meals with improved protein and amino acid content and reduced anti-nutritional factors **Amount:** $33,000

Investigator: Lochmann, Rebecca **Organization:** University of Arkansas System's Division of Agriculture **Category:** Utilization / Meal / Aquaculture

Goals: To determine the performance of largemouth bass fed diets with soybean meals modified to contain fewer anti-nutritional factors (ANFs) and higher protein and/or amino acid contents relative to a standard de-hulled, solvent-extracted 48% protein soybean meal.

Arkansas Soybean Promotion Board

Project: Innovative and value-added products from Arkansas grown non-GMO soybeans for potential commercialization **Amount:** $67,000

Investigator: Hettiarachchy, Navam **Organization:** University of Arkansas System's Division of Agriculture **Category:** Utilization / Meal / Human

Goals: The overall goal is to produce innovative food products from Non-GMO soybeans that can provide high potential returns to Arkansas soybean growers.

Project: Survey of seed pathogens in seed samples submitted to the variety testing program using DNA based diagnostics **Amount:** $28,500

Investigator: Sayler, Ron **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Variety

Goals: Use molecular diagnostic assay to quantify the frequency of pathogens associated with seed submitted to the variety testing program.

Project: Soybean germplasm enhancement using genetic diversity **Amount:** $148,000

Investigator: Chen, Pengyin **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Genetic

Goals: To broaden the gene pool and improve productivity of southern soybean using exotic germplasm with genetic diversity

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Project: Bee project: assessing the impact of Neonicotinoid seed treatments on pollinators **Amount:** $25,000

Investigator: Lorenz, Gus **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Insect / OtherInsect

Goals: To determine whether neonicotinoid insecticides, at the rates being used in typical southern agricultural systems, are impacting pollinator health. If this is the case, appropriate mitigating action will be needed but tempered by the needs of agricultural production.

Project: Edamame production recommendations **Amount:** $80,000

Investigator: Ross, Jeremy **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / OtherManagement

Goals: The overall research mission is to identify and prevent edamame yield losses attributed to insufficient mineral nutrition and evaluate agronomic practices to maximize edamame yield.

Project: Characterize the functionality of soybean seed coats and evaluate novel prebiotic fibers from soy in humans **Amount:** $36,000

Investigator: Lee, Sun **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Composition

Goals: Understand the physical properties of soybean seed coats and provide new uses/applications as functional food ingredients to improve human health

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Arkansas Soybean Promotion Board

Project: Improving germination rate of soybean seed dried using recently-introduced in-bin dying systems agents with commercialization potential **Amount:** $41,000

Investigator: Atungulu, Griffiths **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Quality

Goals: This research is to improve the germination rate of soybean seed dried using recently-introduced in-bin drying systems which monitor not only the ambient air conditions, but also soybean moisture content and temperature throughout the entire grain bin mass during the drying process.

Project: Soybean Science Challenge **Amount:** $76,000

Investigator: Ballard, Karen **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: To develop partnerships with Arkansas FFA, 4-H and Arkansas Science Air organizations and teachers to encourage and expand soy-based knowledge and applied research at the high-school level.

Project: Application Technology Demonstration and Education Program for Arkansas Crops **Amount:** $78,000

Investigator: Barber, Tom **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: Develop and implement an effective application technology field demonstration and evaluation program in soybean production and educate the industry on new technology.

Project: A new transgenic approach to control diseases of soybean in Arkansas **Amount:** $58,000

Investigator: Bluhm, Burt **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Breeding / Genetic

Goals: To develop new transgenic technologies to reduce the impact diseases on soybean production in Arkansas

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Project: Use of a plant elicitor peptide for broad-spectrum nematode resistance **Amount:** $36,000

Investigator: Groggins, Fional **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Nematode / OtherNematode

Goals: To enhance resistance to root-knot nematodes, soybean cyst nematodes, and reniform nematodes in soybean by increasing expression of a plant elicitor peptide that can activate broad-spectrum defenses against nematodes.

Project: Educating growers and consultants on insect monitoring and control **Amount:** $5,000

Investigator: Lorenz, Gus **Organization:** University of Arkansas System's Division of Agriculture **Category:** Pests / Insect / OtherInsect

Goals: To educate growers, consultants, and other ag industry on the proper techniques for monitoring and management of soybean insect pest populations and to help provide them with the tools they need to make effective and economical decisions.

Arkansas Subtotal of (56) Projects: **$3,208,500**

Louisiana Soybean & Grain Research & Promotion Board

Project: Soil Test Calibration And Fertilization Research For Sustainable Soybean And Corn Production In Louisiana **Amount:** $31,058

Investigator: Tubana, Brenda **Organization:** LSU School Of Plant, Environmental & Soil Sciences **Category:** Production / Management / Soil

Goals: The goals of this project are to update fertilizer management and recommendations which will result in more sustainable and profitable soybean and corn production in Louisiana. The specific objectives are to: • Validate and update fertilization rates based on Mehlich-3 soil test ratings for corn and soybean production using a classical-response trial approach; • Evaluate alternative approaches (e.g., build-up and maintenance for P and K, yield goal and optical sensor-based N recommendations) for managing essential nutrients based on quantitative relationships among nutrient supply, crop nutrient demand, crop yield, fertilizer price, soil quality (soil organic matter), and interactions with other nutrients; • Evaluate corn response to P fertilization as affected by soil Zn concentration; • Evaluate the influence of lime application on available soil macro- and micro-nutrient concentrations on an acid upland soil continuously grown with corn; and • Evaluate different approaches for N recommendations using optimal N rate base upon classical N response studies, optical sensors, and a yield goal concept.

Project: In-Field Evaluation Of Soil Fertility For Soybean And Corn **Amount:** $13,903

Investigator: Haggard, Beatrix **Organization:** LSU Northeast Research Station **Category:** Production / Management / Soil

Goals: Field studies will be conducted to determine optimum fertility levels for soybean and corn production in Louisiana. Plant tissue and soil samples will be monitored to assess fertility effects.

Project: Using Molecular Biology To Control Soybean Diseases: Cercospora Leaf Blight And Rust **Amount:** $55,928

Investigator: Chen, Zi-Yuan **Organization:** LSU Plant Pathology & Crop Physiology **Category:** Pests / Disease / Cercospora

Goals: Discovering the impact of cercosporin in soybean may enable specialists to develop more effective control options for CLB. The research study will explore the importance of cerosporin in soybeans. The specific objectives of the project are: • Determining the importance of two light induced genes in cerosporin toxin production; • Developing mutants lacking cercosporin toxin production to determine the importance of cercosporin toxin in causing leaf blight disease in soybean; and • Exploring a new approach to control Cercospora leaf blight and rust diseases in soybean.

Project: Supplement to Biology and Control of Major Diseases of Soybean **Amount:** $16,000

Investigator: Schneider, Raymond **Organization:** LSU School Of Plant, Environmental & Soil Sciences **Category:** Pests / Disease / OtherDisease

Goals:

Project: Re-evaluation Of Threecornered Alfalfa Hopper Pest Status In Louisiana Soybeans **Amount:** $14,950

Investigator: Beuzelin, Julien **Organization:** LSU Dean Lee Research Station **Category:** Pests / Insect / OtherInsect

Goals: This study will document the occurrence of three-cornered alfalfa hopper in Louisiana soybean fields and currently implemented management tactics. Fields studies will be conducted to reevaluate potential yield losses associated with this pest of soybeans.

Louisiana Soybean & Grain Research & Promotion Board

Project: Weed Management And Biology Research In Soybeans **Amount:** $40,000

Investigator: Griffin, James **Organization:** LSU School Of Plant, Environmental & Soil Sciences **Category:** Pests / Weed / WeedOther

Goals: Understanding the interaction between pest management practices and use of harvest aids is critical to maximizing soybean yield potential and economic return. This project involves the following objectives: • Evaluating crop safety, weed control, and fit of experimental herbicides in Louisiana production systems and to develop cost effective weed management programs; • Evaluating future transgenic technologies for weed control and non-target crop response; • Monitor weed population shifts and weed resistance associated with herbicide-resistant crops; and • Evaluate possible interactions that may occur with use of insecticides, fungicides, and harvest aids.

Project: Electrically-Charged Fungicide Adjuvant **Amount:** $28,000

Investigator: Sabliov, Cristina **Organization:** LSU Biological & Ag Engineering **Category:** Pests / Disease / Fungicide

Goals: The goal of these studies is to apply nanotechnology to the field of agriculture, with the specific purpose of improving pesticide/herbicide functionality to be used in soybeans.

Project: Cercospora Leaf Blight Disease of Soybean-Screening Soybean Varieties for Differences in the Expression of Resistance Genes **Amount:** $35,055

Investigator: Chen, Zi-Yuan **Organization:** LSU Plant Pathology & Crop Physiology **Category:** Production / Breeding / Genetic

Goals: Pinpointing the exact source of inoculums could help us develop measures to reduce inoculum, therefore, limiting the exposure of soybean leaves to the pathogen. This project involves: • Identifying soybean lines showing consistently high levels of tolerance to C. kikuchii infections; • Screening four tolerant and four susceptible lines under greenhouse conditions; • Investigating the effect of water/humidity/moisture on CLB development; and • Determining the source of Cercospora kikuchii inoculums.

Project: Measuring Yield Losses Due To Diseases Of Soybeans **Amount:** $24,000

Investigator: Hollier, Clayton **Organization:** LSU Plant Pathology & Crop Physiology **Category:** Pests / Disease / OtherDisease

Goals: This project will emphasize the area of disease forecasting and yield loss assessments. The researcher will: • Determine the effectiveness of selected management strategies (reduced rates of fungicides, tank mixes and split applications); • Develop decision aids for fungicide use; • Determine yield losses due to wheat diseases; and • Evaluate all soybean variety plots across the state for disease loss.

Project: Soybean Disease (including Rust) Sentinel Plot Scouting Program **Amount:** $27,500

Investigator: Hollier, Clayton **Organization:** LSU Plant Pathology & Crop Physiology **Category:** Pests / Disease / OtherDisease

Goals: By monitoring for diseases, we can potentially reduce losses and increase profits for growers. The research involved in this project will: • Establish twenty soybean sentinel plots across the state to weekly monitor SBR and other diseases; • Publicize the results of the weekly soybean observations as they are available; • Advise soybean producers on applications of fungicides based on weekly results and yearly accumulation of disease information; and • Use mobile scouting (scouting of commercial fields) as sentinel plots mature.

Louisiana Soybean & Grain Research & Promotion Board

Project: Surveying Louisiana Soybeans for Soybean Vein Necrosis and Soybean Mottle **Amount:** $20,000

Investigator: Valverde, Rodrigo **Organization:** LSU Plant Pathology & Crop Physiology **Category:** Pests / Disease / Virus

Goals: This investigation will obtain information on the resistance or susceptibility of soybean lines to infections by three soybean viruses that occur in Louisiana. The goal of this soybean breeding effort is to make available to Louisiana soybean growers soybean lines that have been tested for viruses. The specific objectives are to: • Inoculate selected soybean breeding lines with Soybean mosaic, Bean pod mottle and Tobacco ringspot viruses; • Evaluate the reaction of breeding-lines to each individual virus; and • Analyze the results and provide data to the soybean breeders that are developing new varieties.

Project: Soybean Looper Population Growth Rates on Herbicide Resistant Weeds **Amount:** $16,480

Investigator: Davis, Jeff **Organization:** LSU Entomology **Category:** Pests / Insect / OtherInsect

Goals:

Project: Improving Management of Double Crop Soybean Production **Amount:** $26,559

Investigator: Lofton, Josh **Organization:** LSU Macon Ridge Research Station **Category:** Production / Management / OtherManagement

Goals:

Project: 2014 Louisiana Soybean & Grain Research & Promotion Board Report **Amount:** $4,500

Investigator: Gould, Frankie **Organization:** LSU Biological & Ag Engineering **Category:** Production / Management / Education

Goals: The focus of this continuing project is to develop a full color tabloid that highlights Louisiana Soybean and Grain Research and Promotion Board funded projects and to distribute this report to producers, political leaders, industry and stakeholders. A secondary objective is to develop news stories based on board funded projects that are distributed through LSU AgCenter news service. The articles and press releases will also be posted on the LSU AgCenter website.

Project: Biology and Control Of Major Diseases of Soybeans **Amount:** $94,613

Investigator: Schneider, Raymond **Organization:** LSU Plant Pathology & Crop Physiology **Category:** Pests / Disease / OtherDisease

Goals: Understanding the biology and genetics of pathogens will equip specialists to develop methods of combating diseases as they change. This project: • Develops and verifies commercially acceptable fungicide application protocols for Cercospora leaf blight. Other diseases also will be evaluated in these tests; • Continues assessments of plant nutrition on development of CLB, rust and other diseases; • Test foliar applications of minor elements, such as zinc, copper and iron, for their effects on disease development; • Implements a fungicide resistance monitoring program for rust and CLB pathogens; • Screens selected germplasm and breeding lines for resistance to rust; and • Finalizes and makes available to the industry our yield loss calculator.

Louisiana Soybean & Grain Research & Promotion Board

Project: Timing Of Irrigation Initiation And Termination On Soybean Yield In Northeast Louisiana **Amount:** $18,177

Investigator: Lofton, Josh **Organization:** LSU Macon Ridge Research Station **Category:** Production / Management / Water

Goals: The knowledge of proper irrigation scheduling is essential for achieving optimum soybean yields. One key aspect of irrigation scheduling is determining when to initiate and terminate irrigation practices. Therefore, the results of this study will be to aid Louisiana producers determine the optimum initiation and termination of irrigation for Louisiana soybean production.

Project: Soybean Weed Control Research In Northeast Louisiana **Amount:** $36,800

Investigator: Miller, Donnie **Organization:** LSU Northeast Research Station **Category:** Pests / Weed / WeedOther

Goals: Assessing the impact of herbicide co-applications on weed control efficacy could provide more economical control options. The researchers involved in this project will continue to evaluate: • Experimental compounds for weed efficacy and crop tolerance; • Burndown programs, emphasizing control of henbit with spring and fall programs; • Dicamba co-application effects with additional pesticides on weed control; • Soil residual effects from dicamba drift on non-resistant soybean; and • Tillage and chemical removal on post harvest weed germination. The research will also conduct cooperative work verifying resistant weed species and identification of control measures.

Project: Optimizing Chemical Control Strategies For Louisiana Soybean Pests **Amount:** $26,506

Investigator: Kerns, David **Organization:** LSU Macon Ridge Research Station **Category:** Pests / Insect / OtherInsect

Goals: This research defines the thresholds of seed injury at different soybean growth stages and provides opportunities to further refine IPM strategies. The project's specific objectives are to: • Evaluate soybean IST products/rates against seed and seedling pests and measure yield impacts; • Refine action thresholds and define when to terminate soybean IPM based upon seed yield/quality; • Evaluate chemical control technologies against pests, with an emphasis on stink bugs/ caterpillars; • Determine three-cornered alfalfa hopper injury on soybeans during vegetative/reproductive stages; and • Initiate an experiment to determine the impact of spider mites on soybean yield.

Project: Evaluation of Management Practices and Variety Selection for Improved Soybean Seed Quality **Amount:** $22,630

Investigator: Lofton, Josh **Organization:** LSU Macon Ridge Research Station **Category:** Production / Breeding / Variety

Goals: This project involves identifying factors that affect seed quality which will result in the development of methods that will enable growers to improve seed quality. The researcher will: • Develop a method to rapidly evaluate soybean seed quality that relates well to state and federal grading standards; • Assess differences among varieties in seed quality at maturity and after periods of field weathering; and • Evaluate the value of fungicides and insecticides at mid and late growth stages (R3- R6) for control of damaging seed diseases and insects and improvement of seed quality.

Project: Integrated Mgt of Changing Soybean Insect Pest Complexes **Amount:** $57,350

Investigator: Davis, Jeff **Organization:** LSU Entomology **Category:** Pests / Insect / OtherInsect

Goals: The potential for making over applications of insecticide could be lessened or eliminated if response differences to stink bug among soybean varieties are better understood. This project will: • Quantify in-field stink bug immigration and population increase on variety DP 4888 RR (moderately stink bug resistant) and variety P4906 RR (stink bug susceptible) receiving five different treatments; and • Determine treatment effects on seed yield and seed quality.

Louisiana Soybean & Grain Research & Promotion Board

Project: Evaluation Of Cercospora Leaf Blight And Purple Seed Stain In Louisiana **Amount:** $30,893

Investigator: Price, Trey **Organization:** LSU Macon Ridge Research Station **Category:** Pests / Disease / Cercospora

Goals: Cultivation methods and the effect on CLB and PSS need to be understood to prevent deterioration of seed quality. This project involves: • Further defining C. kikuchii disease development at all stages of soybean development; • Evaluating the effect of seed treatment on C. kikuchii; • Exploring possible alternative hosts and overwintering sites of C. kikuchii; • Studying possible interactions between C. kikuchii and soybean insect pests; and • Determining the effects of cultivation techniques on C. kikuchii.

Project: Evaluation Of Soybean Cultivars And Fungicides For Disease Management In Northeast Louisiana **Amount:** $26,006

Investigator: Price, Trey **Organization:** LSU Macon Ridge Research Station **Category:** Pests / Disease / Fungicide

Goals: This project will focus on: • Evaluating soybean varieties entered in the LSU AgCenter Experiment Station official variety trials for resistance to disease pathogens common to Northeast, Northwest, and Central Louisiana; • Evaluating for commercially available and experimental fungicides for soybean disease management: and • Quantifying disease losses in selected soybean varieties adapted for Louisiana to determine when fungicides are necessary.

Project: Soybean And Grain On-Farm Demonstration Program - 2013 **Amount:** $50,000

Investigator: Levy, Ron **Organization:** LSU Dean Lee Research Station **Category:** Production / Management / Education

Goals: The project focus is to: • Conduct soybean, corn, and grain sorghum on-farm demonstrations throughout the state; • Conduct field days and producer meetings to discuss and present demonstration results; • Work with producers on their farms with precision ag equipment; and • Collect data and compile it into a publication for distribution at meetings and on the LSU AgCenter website.

Project: Optimization of Potassium Fertilization for Corn and Soybean Production **Amount:** $15,668

Investigator: Haggard, Beatrix **Organization:** LSU Northeast Research Station **Category:** Production / Management / Soil

Goals: Farmers in Louisiana have seen an increase in the frequency and severity of potassium deficiencies, especially in regions where potassium nutrition was not a problem. One potential explanation for this is the continuing increases in yields of both soybean and corn. This study will investigate late season potassium deficiencies and the beneficial use foliar potassium products in preventing potassium deficiencies in Louisiana.

Project: Agronomic Research and Extension To Improve Soybean Production In Louisiana **Amount:** $25,000

Investigator: Levy, Ron **Organization:** LSU Dean Lee Research Station **Category:** Production / Management / Education

Goals: The objectives of this project are to: • Investigate the effect of various agronomic, cultural, and management factors on soybean production in Louisiana; • Evaluate soybean varieties for their strengths and weaknesses, in addition to yield potential, and develop strategies to optimize their production; and • Disseminate research findings to Louisiana soybean producers, other agricultural personnel, and the scientific community through county agents, consultants, commodity meetings, popular press, online publications, professional meetings, and scientific journals.

Louisiana Soybean & Grain Research & Promotion Board

Project: Soybean Breeding And Variety Development **Amount:** $26,113

Investigator: Buckley, Blair **Organization:** LSU Red River Research Station **Category:** Production / Breeding / Variety

Goals: This soybean breeding program is designed to develop high-yielding, disease resistant soybean varieties and germplasm adapted to the environmental conditions of Louisiana and the Gulf Coast region. In addition to yield, the traits emphasized are Cercospora leaf blight resistance, Frogeye leaf spot resistance, Asian soybean rust resistance, drought tolerance and salt tolerance.

Project: Evaluation Of Soybean Cultural Practices In Southwest Louisiana **Amount:** $64,710

Investigator: Harrell, Dustin **Organization:** LSU Rice **Category:** Production / Management / OtherManagement

Goals: This project involves optimum planting dates for group V and IV soybean in Southwest Louisiana. Differences in agronomic parameters, such as plant height, lodging, maturity, test weight, and days to specific growth stages, will be determined and related to soybean yield.

Project: Development of Methods Assessing the Effects of Drought and Salt Stress on Soybean Insect Management **Amount:** $3,500

Investigator: Beuzelin, Julien **Organization:** LSU Dean Lee Research Station **Category:** Pests / Insect / OtherInsect

Goals:

Project: Development of Technologies to Reduce Off-target Spray Drift in Soybeans **Amount:** $12,500

Investigator: Price, Randy **Organization:** LSU Dean Lee Research Station **Category:** Pests / Weed / HerbApplication

Goals:

Project: Soybean Weed Management Systems In Louisiana **Amount:** $55,000

Investigator: Stephenson, Daniel **Organization:** LSU Dean Lee Research Station **Category:** Pests / Weed / WeedOther

Goals: Determination of weed management systems that utilize herbicide-tolerant crops along with various chemical and cultural weed control methods provides Louisiana soybean producers with effective weed management strategies. This project: • Identifies and investigates weed management with new and/or currently registered herbicide-tolerant soybeans in Louisiana; • Elucidates the potential of currently registered and/or new herbicide products for weed management in Louisiana soybeans; • Investigates and confirms herbicide resistant weeds in Louisiana and identifies methods to control and/or mitigate this issue; and • Disseminates information on weed management systems to Louisiana soybean producers and the scientific community through county agents, consultants, commodity meetings, popular press, online publications, professional meetings, and scientific journals.

Louisiana Subtotal of (30) Projects: **$919,399**

Mid-South Soybean Board

Project: Irrigation Water Management for Southern Region Soybean Growers (Year 1 of 4) **Amount:** $50,000

Investigator: Krutz, Jason **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / Education

Goals: One of the cornerstones of this project is the Delta States Irrigation Conference and the first of four of such annual conferences is planned for December 17-18, 2014 at the Miner Convention Center in Sikeston, MO. This project represents the most recently approved MSSB/USB project and promises to be a large, comprehensive hands-on with producer irrigation and water management educational effort. Additionally, the principle investigators plan to update the software program associated with the Phaucet program to make it much more user friendly. In addition, project investigators will work with the industry to maximize water management efforts resulting in greater water use efficiency with current developed programs such Delta Plastic's Pipe Planner program. Each mid-South investigator will initiate several in-depth on-farm water management demonstrations utilizing the latest technology each year and rotate to new demonstration cooperators each year.

Project: Effects of the Introduction of Feed Grains into Mid-South Soybean Production Systems (Year 2 of 6) **Amount:** $201,000

Investigator: Golden, Bobby **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / OtherManagement

Goals: This five-state long-term (six year) regional rotation study project will produce data useful to assist Mid-South soybean producers make important production and economic decisions regarding crop rotation based upon information supplied by Extension personnel, and seed companies, etc. Often the information is limited, inconsistent and not applicable to the geographic area that is being considered by the producer or the crop advisor in the Mid-South. Unfortunately, the significance of crop rotation of soybean with feed grains cultivated in southern latitudes impact upon overall soybean production is not well understood. This research will attempt to address this issue and provide Mid-South producers information about crop rotations influence on sustainable soybean production generated at their latitudes. Rationale and Objectives: 1) Determine the optimal rotation partner for soybean/feed grain based production systems in the Mid-South. 2) Evaluate the benefit of feed grain residue management on the following soybean crop. 2a). Determine if current Best Management Practices for soybean rotations in the Mid-South need to be revised. 2b). Determine the Sustainability of Non Irrigated vs. Irrigated soybean production in Mid Southern Micro Environments. 2c) Assess the economic advantage of soybean rotation with feed grains compared to monoculture soybean production in the Mid-South.

Project: Effect of Planting Date, Latitude, and Environmental Factors on Choice of Maturity Group in Mid-South Soybean Production (Concluded Year 3 of 3 – Currently working on I YR Extension) **Amount:** $50,000

Investigator: Purcell, Larry **Organization:** University of Arkansas System's Division of Agriculture **Category:** Production / Management / OtherManagement

Goals: This six state regional project is producing data useful to predict the effects of latitude and planting date on the growth and development of a uniform set of four or five commercially available soybean varieties of four different MGs (MGs 3, 4, 5 & 6). These same varieties will be planted at four different planting dates (late-March, mid-April, mid-May and mid-June). In addition to the factors mentioned above, this project will include a component for making specific observations and recording disease and insect incidence and the associated cost of controlling these pests at each location. This regional study will also provide the opportunity for measuring the effects of different Mid-south production environments (MGs & Planting Date) on both seed composition and quality.

Mid-South Subtotal of (3) Projects: **$301,000**

Mississippi Soybean Promotion Board

Project: Soybean vein necrosis virus (SVNV) in Mississippi, 66-2014 **Amount:** $49,391

Investigator: Sabanadzovic, Sead **Organization:** Miss. State Univ. **Category:** Pests / Disease / Virus

Goals: Estimate incidence of SVNV in Mississippi soybeans, annotate symptoms in infected plants, ID alternative hosts, and study genetic diversity of the MS SVNV population.

Project: Web application for flexible pipe calculation system, 76-2014 **Amount:** $26,487

Investigator: Loper, James **Organization:** Miss. State Univ. **Category:** Production / Management / Water

Goals: Create an online software tool that can be used to optimize designs for flexible pipe irrigation systems.

Project: Soybean physiological maturity: documentation and developing a tool for management, 75-2014 **Amount:** $100,718

Investigator: Reddy, K. Raja **Organization:** Miss. State Univ. **Category:** Production / Management / OtherManagement

Goals: Precisely identify reproductive stages of soybean and soybean physiological maturity as a defined period from flowering in MG IV and V varieties.

Project: Determine irrigation rate and timing, and water availability for optimum yield, water use efficiency, and profitability of soybean in Mississippi Blackland Prairie region, 62-2014 **Amount:** $25,000

Investigator: Feng, Gary **Organization:** USDA-ARS **Category:** Production / Management / Water

Goals: Determine triggering criteria to maximize yield and water use efficiency (WUE) when using on-farm stored water for irrigation, and compare economics of using surface vs. groundwater.

Project: MSU-ES on-farm soybean variety demonstration program, 57-2014, **Amount:** $46,624

Investigator: Irby, Trent **Organization:** Miss. State Univ./MCES **Category:** Production / Breeding / Variety

Goals: Identify soybean varieties that are best suited to specific soil regions of Mississippi, and collect data that can be used to refine results from the MSVT.

Project: Three-cornered alfalfa hopper (TCAH) management in soybeans, 17-2014, **Amount:** $50,820

Investigator: Musser, Fred **Organization:** Miss. State Univ. **Category:** Pests / Insect / OtherInsect

Goals: Refine current TCAH thresholds in soybeans; estimate sweep net sampling efficiency for TCAH in soybeans; and evaluate efficacy and residual activity of insecticide seed treatments and foliar insecticides against TCAH.

Mississippi Soybean Promotion Board

Project: Mitigating herbicide spray drift under field conditions, 44-2014 **Amount:** $38,167

Investigator: Reynolds, Dan **Organization:** Miss. State Univ. **Category:** Pests / Weed / HerbApplication

Goals: Compare effect of various spray tips on herbicide drift, and the efficacy of these spray tips when used with contact, auxin, and systemic herbicides; compare efficacy of light and non-light activated herbicides when applied during both daytime and nighttime hours.

Project: Row crop irrigation science extension and research (RISER) program, 55-2014 **Amount:** $137,256

Investigator: Krutz, Jason **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Water

Goals: Develop and validate irrigation best management practices, and utilize onsite farm application and training programs to facilitate wide-spread adoption of these best irrigation management practices and water conservation tools for soybean producers in Mississippi

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Project: Developing strategies for improving furrow irrigation efficiency, 54-2014, **Amount:** $76,100

Investigator: Krutz, Jason **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Water

Goals: Determine utility of surge irrigation and surge irrigation + PHAUCET for increasing surface irrigation efficiency while simultaneously maintaining or improving irrigated soybean yields.

Project: Developing profitable deficit irrigation guidelines for Mississippi soybean production systems, 53-2014 **Amount:** $98,497

Investigator: Krutz, Jason **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Water

Goals: Increase soybean yield potential and profitability by developing production systems that require up to 25% less irrigation water through 1) determining optimum physiological period for initiating irrigation, 2) determining critical physiological period for terminating irrigation, and 3) determining growth stage(s) when deficit irrigation adversely affects yield and profitability.

Project: Developing scientific irrigation scheduling methods for Mississippi soybean production systems, 52-2014 **Amount:** $34,977

Investigator: Krutz, Jason **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Water

Goals: Evaluate existing and new irrigation scheduling tools for improving soybean yield, seed quality, and irrigation water use efficiency under Midsouth growing conditions.

Project: Bufkin Fellowship: Effect of fall-seeded cereal cover crops when used in soybeans for control of Palmer amaranth in Mississippi soybeans, 51-2014, **Amount:** $68,000

Investigator: Edwards, Ryan **Organization:** Miss. State Univ. **Category:** Pests / Weed / HerbResistance

Goals: Determine effectiveness of cover crops for controlling underlying weed populations in conjunction with PRE residual herbicide applications in soybeans.

Mississippi Soybean Promotion Board

Project: Farm Families of Mississippi, MFBF, 50-2014 **Amount:** $15,000

Investigator: **Organization:** **Category:** Production / Management / Education

Goals:

Project: Estimation of deer damage to soybean production in Mississipa spatial and temporal context, 48-2014 **Amount:** $28,281

Investigator: Strickland, Bronson **Organization:** Miss. State Univ. **Category:** Pests / Wildlife / Deer

Goals: Quantify deer abundance and utilization of soybean fields during browsing, and estimate/quantify subsequent loss of soybean yield; characterize deer habitat surrounding soybean fields to establish relationship with soybean damage; and test various deer-damage mitigation techniques for potential economic benefit.

Project: Lepidopteran insect pest management in soybeans, 01-2014 **Amount:** $72,163

Investigator: Cook, Don **Organization:** Miss. State Univ. **Category:** Pests / Insect / OtherInsect

Goals: Refine/validate current corn earworm thresholds in soybeans; determine residual efficacy of new insecticides for control of soybean looper; maintain and continue testing of labeled insecticides to manage soybean insects.

Project: Development of Phomopsis seed decay-resistant soybean lines from new sources of resistance, 28-2014 **Amount:** $18,000

Investigator: Gillen, Anne **Organization:** USDA-ARS **Category:** Production / Breeding / OtherBreeding

Goals: Develop high-yielding soybean lines with resistance to Phomopsis seed decay (PSD).

Project: Surface conditions affecting likelihood of temperature inversions and timing of aerial spraying, 47-2014 **Amount:** $10,463

Investigator: Thomson, Steve **Organization:** USDA-ARS **Category:** Production / Management / PrecisionAg

Goals: Use weather tower data to track atmospheric stability over a cropping season and use results to predict when a temperature inversion is likely to occur.

Project: Determining the effect of low concentrations of dicamba and 2,4-D on soybean growth and yield, 42-2014 **Amount:** $37,469

Investigator: Reynolds, Dan **Organization:** Miss. State Univ. **Category:** Pests / Weed / HerbApplication

Goals: Determine effect of simulated drift and volatility of dicamba and 2,4-D on soybean growth and yield, and the most sensitive soybean growth stage to these herbicides; compare the effectiveness of various clean-out procedures for sprayers that have been used to apply these auxin herbicides.

Mississippi Soybean Promotion Board

Project: Video support for Mississippi soybean producers, 41-2014 **Amount:** $16,203

Investigator: Spann, Leighton **Organization:** Miss. State Univ. **Category:** Production / Management / Education

Goals: Identify important soybean production topics and produce video segments that will provide producers with current, timely information needed to address issues related to those topics; video presentations of results from MSPB-funded research projects that will be posted on the MSPB website (www.mssoy.org)

Project: Yield and economic responses of soybean to irrigation initiation on clay soil in Mississippi, 40-2014 **Amount:** $25,322

Investigator: Pringle, H.C. Lyle **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Water

Goals: Determine the relationship of irrigation initiation timing to yield and economic return from soybean grown on Mississippi Delta soils.

Project: Characterization of the resistance potential for the diamide insecticides Belt and Prevathon, 37-2014 **Amount:** $37,316

Investigator: Gore, Jeffrey **Organization:** Miss. State Univ./DREC **Category:** Pests / Insect / OtherInsect

Goals: Quantify the variation in response of bollworm; determine influence of selection pressure on resistance development in bollworm, soybean looper, and beet armyworm; correlate field control with this insecticide class against resistant and susceptible insect populations; and determine heritability and mechanisms of resistance in these insects.

Project: Provide in-field soybean diagnostic service for Mississippi soybean producers, 35-2014 **Amount:** $10,000

Investigator: Moore, Billy **Organization:** Private Consultant **Category:** Pests / Disease / OtherDisease

Goals: To provide soybean disease diagnostic assistance to soybean producers and leaders of MSPB-funded projects.

Project: Development of a seedling inoculation technique to evaluate soybean for resistance to Phomopsis seed decay, 34-2014 **Amount:** $26,679

Investigator: Li, Shuxian **Organization:** USDA-ARS **Category:** Pests / Disease / OtherDisease

Goals: Develop a seedling inoculation technique to evaluate soybean for resistance to Phomopsis seed decay (PSD), analyze the correlation between seed assays from field trials and the seedling assays, and use the technique to test soybean varieties for PSD resistance.

Project: Development of reniform nematode resistant soybean lines from JTN-5203, PI 404166, and 02011-126-1-1-5-1-1 soybean, 33-2014 **Amount:** $23,300

Investigator: Stetina, Salliana **Organization:** USDA-ARS **Category:** Production / Breeding / Genetic

Goals: Develop F2 and F2:3 populations derived from crosses between the above lines and soybean lines agronomically adapted for Mississippi, and evaluate progeny from these populations for selection of genotypes with superior reniform nematode resistance.

Mississippi Soybean Promotion Board

Project: Phenotyping F2 populations segregating for frogeye leaf spot resistance, 32-2014 **Amount:** $24,500

Investigator: Ray, Jeff **Organization:** USDA-ARS **Category:** Production / Breeding / OtherBreeding

Goals: Apply molecular markers to F2 DNA from previous F2 phenotype screening, phenotype a confirming F2 population segregating for C. sojina resistance, collect tissue and isolate DNA from the confirming population, and advance F2 lines in a breeding program.

Project: Blaine FellowshipûManaging charcoal rot using soil incorporated nutrients, 72-2014 **Amount:** $70,800

Investigator: Wilkerson, Tessie **Organization:** Miss. State Univ. **Category:** Pests / Disease / RootRot

Goals: Determine the role of nutrition and soil-applied nutrients in reducing infection by charcoal rot, and determine pathogenicity differences among isolates of the pathogen that originate from other hosts in addition to soybeans.

Project: Remote sensing of row crops with small unmanned aerial vehicles (UAV), 46-2014 **Amount:** $2,700

Investigator: Pennington, Dean **Organization:** **Category:** Production / Management / PrecisionAg

Goals: Evaluate and improve operational capabilities of the UAV/remote imagery/data analysis components used in remote sensing, and identify correlations between imagery data and components of mapped locations.

Project: Soybean response to N addition in high yield environments, 27-2014, **Amount:** $22,770

Investigator: Golden, Bobby **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Soil

Goals: Determine critical application time for and form of N fertilizer that will minimize detriment to N2 fixation and potentially increase soybean seed yield.

Project: Large-scale drift assessment with aerial imagery and ground-based spectral reflectance, 45-2014 **Amount:** $39,667

Investigator: Reynolds, Dan **Organization:** Miss. State Univ. **Category:** Pests / Weed / HerbApplication

Goals: Evaluate effect of drift reduction technologies on off-target soybean injury with dicamba; assess use of aerial imagery and ground-based spectral reflectance methods for mapping drift injury on large landscapes; and develop a pictorial guide for rating dicamba injury.

Project: Evaluation of soybean plant response to tillage system, 02-2014 **Amount:** $12,000

Investigator: Flint, Ernie **Organization:** MCES **Category:** Production / Management / Soil

Goals: Determine economic feasibility of adopting a no-till system for soybean production, and evaluate soybean performance and soil parameters when a no-till system is converted to a till system of production.

Mississippi Soybean Promotion Board

Project: Bee project: Assessing impact of neonicotinoid (NEO) seed treatments on pollinators, 59-2014 **Amount:** $54,948

Investigator: Catchot, Angus **Organization:** Miss. State Univ./MCES **Category:** Pests / Insect / OtherInsect

Goals: Quantify number of honey bees visiting agronomic crops in MS, titrate NEO insecticides in feeding stations in bee hives and monitor bee health, and determine NEO levels in soybeans from emergence through maturity after seed treatment with NEO insecticides.

Project: Impact of irrigation initiation timing on plant development and yield of indeterminate and determinate soybean varieites, 56-2014 **Amount:** $48,890

Investigator: Irby, Trent **Organization:** Miss. State Univ./MCES **Category:** Production / Management / Water

Goals: Provide economic assessment of various irrigation initiation timings, and measure differences in plant development and yield from the different timings.

Project: Characterization of endophytic microbial communities associated with charcoal rot disease in soybean, 60-2014 **Amount:** $61,064

Investigator: Lu, Shi-En **Organization:** Miss. State Univ. **Category:** Pests / Disease / RootRot

Goals: Characterize endophytic bacterial and fungal communities associated with charcoal rot disease, and investigate the effects of inoculation with bacteria and fungi on charcoal rot disease development and soybean growth.

Project: Impact of planting date and maturity group on management strategies for insect pests in Mississippi, 58-2014 **Amount:** $58,647

Investigator: Catchot, Angus **Organization:** Miss. State Univ./MCES **Category:** Pests / Insect / OtherInsect

Goals: In ESPS and conventional soybean plantings of MG IV and V varieties, identify seasonal periods that are most susceptible to damage from insect pests, evaluate effects of season-long caterpillar control, and document potential risk from caterpillar pests by using disruptive pyrethroid sprays.

Project: Investigations into strobilurin fungicide resistance of soybean pathogens in Mississippi, 61-2014 **Amount:** $53,585

Investigator: Tomaso-Peterson, Maria **Organization:** Miss. State Univ. **Category:** Pests / Disease / Fungicide

Goals: Monitor soybean fields for strobilurin (Qo1) resistance in selected diseases, ID mechanisms of resistance, and determine potential fitness costs associated with Qo1 resistant soybean pathogens.

Project: Corn and soybean crop residue management impact on soil quality, yield, and returns, 25-2014 **Amount:** $36,714

Investigator: Buehring, Normie **Organization:** Miss. State Univ./NMREC **Category:** Production / Management / Soil

Goals: Determine how tillage and management of residue in a corn/soybean rotation affect soil quality, crop yields, and economic returns.

Mississippi Soybean Promotion Board

Project: Correlation of soil test K and P indices with plant tissue concentrations and soybean yield, 22-2014 **Amount:** $34,406

Investigator: Golden, Bobby **Organization:** Miss. State Univ./DREC **Category:** Production / Management / Soil

Goals: Evaluate soybean yield response to P and K fertilization rate; correlate Lancaster and Mehlich-3 soil test P and K with plant indices (tissue concentration and seed yield).

Project: Response and net profit of genetically enhanced and conventional soybean varieties to fertilizer recommendations on low nutrient soils in rainfed and irrigated production systems, 21-2014 **Amount:** $57,616

Investigator: Shankle, Mark **Organization:** Miss. State Univ., PRFBES **Category:** Production / Breeding / Genetic

Goals: Compare/validate fertility recommendations from different soil testing facilities; identify optimum K fertilizer rate for new compared to old soybean varieties grown on soils low in K; determine the economic benefits of K fertility recommendations from different testing labs.

Project: Agronomic and economic evaluation of soybean/corn rotation with twin- row production and increased nutrient management, 07-2014 **Amount:** $22,678

Investigator: Ebelhar, M. Wayne **Organization:** Miss. State Univ./DREC **Category:** Production / Management / OtherManagement

Goals: Determine agronomic implications of soybean/corn rotations in twin-row planting systems under standard and high soil fertility with irrigation; evaluate impact of soybean/corn rotation system on whole-farm profitability.

Project: Effect of spray additives on spray droplet size, coverage, and efficacy, 04-2014 **Amount:** $15,131

Investigator: Dodds, Darrin **Organization:** MCES **Category:** Pests / Weed / HerbApplication

Goals: Determine the impact of spray additives on spray droplet size, spray coverage, and efficacy of common pesticides.

Project: Determining environmental management schemes to influence the development of high seed quality in MG IV and MG V soybean, 14-2014, **Amount:** $90,699

Investigator: Allen, Tom **Organization:** Miss. State Univ./DREC **Category:** Production / Breeding / Quality

Goals: Create environments (controlled and natural settings) conducive to the development of seed rot, and determine their impact on seed quality; determine specific pathogenic organisms that infect soybean plant parts in the different environments, and their pathogenicity; and determine nutrition status of seed and plant tissue and its possible correlation with seed rot.

Project: Support of Delta Agriculture, Delta Council, 05-2014 **Amount:** $15,000

Investigator: **Organization:** **Category:** Production / Management / Education

Goals:

Mississippi Soybean Promotion Board

Project: Addressing critical weed control issues in soybean, 20-2014 **Amount:** $121,608

Investigator: Irby, Trent **Organization:** Miss. State Univ./MCES **Category:** Pests / Weed / HerbResistance

Goals: Develop strategies for management of herbicide-resistant (HR) weeds; determine utility of dicamba-, 2,4-D-, and HPPD-tolerant soybeans for positioning into weed management programs; evaluate weed control strategies such as winter cover crops for managing weeds in soybeans.

Project: Costs and benefits of on-farm water storage (OFWS) systems, 10-2014, **Amount:** $67,896

Investigator: Tagert, Mary Love **Organization:** Miss. State Univ. **Category:** Production / Management / Water

Goals: Quantify and determine the cost-benefit of using OFWS for irrigation water supply, and quantify the nutrient load in recycled water that is used for irrigation.

Project: Soybean storage profitability and marketing strategies for Mississippi soybean growers, 11-2014 **Amount:** $30,792

Investigator: Williams, Brian **Organization:** Miss. State Univ. **Category:** Production / Management / Economic

Goals: Determine the advantages of and estimate the costs associated with storing and drying soybeans in on-farm facilities.

Project: Nematode management investigations in Mississippi soybean production systems, 12-2014 **Amount:** $38,808

Investigator: Allen, Tom **Organization:** Miss. State Univ./DREC **Category:** Pests / Nematode / OtherNematode

Goals: Determine impact of 1) Telone II and seed-applied nematicides on soybean production in nematode-infested fields, 2) variety selection for root knot nematode-infested fields, and 3) winter cover crops for managing sites with high nematode pressure.

Project: Evaluation of the inheritance of resistance to Phomopsis seed decay (PSD) in PI 458130 populations, 31-2014 **Amount:** $43,303

Investigator: Li, Shuxian **Organization:** USDA-ARS **Category:** Production / Breeding / OtherBreeding

Goals: Phenotype F2 population of PI 458130 based on seed plating assays for incidence of Phomopsis infection from a Phomopsis-inoculated field trial in order to identify new sources/genes for resistance to PSD that can be used for breeding high-yielding varieties with PSD resistance.

Project: Soybean disease monitoring for Mississippi soybean producers ,15-2014, **Amount:** $50,000

Investigator: Allen, Tom **Organization:** Miss. State Univ./DREC **Category:** Pests / Disease / Rust

Goals: Monitor occurrence and geographic location of foliar diseases, including rust, and provide producers with up-to-date information that can be used to make timely treatment decisions; determine environmental conditions that promote soybean rust, and effective fungicide management schemes for rust treatment in locations where it occurs.

Mississippi Soybean Promotion Board

Project: Delta agricultural weather project, 29-2014 **Amount:** $23,889

Investigator: Silva, Mark **Organization:** Miss. State Univ./DREC **Category:** Production / Management / PrecisionAg

Goals: Continue data collection and dissemination of pertinent agricultural weather data and products required by Delta researchers and producers.

Project: Evaluation of private and public soybean varieties and breeding lines for resistance to stem canker, forgeye leaf spot, purple leaf and pod stain, black root rot, and rust, 19-2014 **Amount:** $49,093

Investigator: Sciumbato, Gabe **Organization:** Miss. State Univ./DREC **Category:** Production / Breeding / Variety

Goals: Determine virulence of collected stem canker isolates; evaluate entries in the Mississippi Soybean Variety Trials (MSVT) for resistance/reaction to stem canker, frogeye leaf spot, purple leaf and pod stain, and black root rot; and evaluate MSVT entries for resistance to soybean rust.

Mississippi Subtotal of (50) Projects: **$2,219,437**

Missouri Soybean Merchandizing Council

Project: Defense peptides to protect soybean from rust **Amount:** $78,100

Investigator: English, Jim **Organization:** University of Missouri **Category:** Pests / Disease / Rust

Goals: This research is a biotech approach to preventing rust infestation on soybean.

Project: Lunasin attenuates age-related chronic kidney disease **Amount:** $0

Investigator: Parrish, Alan **Organization:** University of Missouri, School of Medicine **Category:** Utilization / Meal / Human

Goals: The aim of the research is to demonstrate that a high-lunasin soy protein diet attenuates the progression of age-dependent chronic kidney disease.

Project: Microbial digestion of soybean hulls **Amount:** $0

Investigator: Kerley, Monty **Organization:** University of Missouri **Category:** Utilization / Hulls / Hulls

Goals: The goal is to increase the feed value of soybean to animals which aligns with the Better Bean Initiative, and coordination and support of animal agriculture. The research should allow for the identification of technology that would improve the fermentability of oilseed and processed grain fibers.

Missouri Soybean Merchandizing Council

Project: Advanced biotechnologies for soybean breeding and nutritional enhancement **Amount:** $0

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / OtherBreeding

Goals: This project takes a holistic biotech approach to identify enabling technology traits, transformation tools and ultimately varieties that contain value-added biotech traits.

Project: High throughput cloning and functional characterization of molecular switches for stress tolerance and enhanced seed composition in soybean **Amount:** $0

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Composition

Goals: This project takes a holistic biotech approach to identify enabling technology traits, transformation tools and ultimately varieties that contain value-added biotech traits.

Project: Molecular-genetic regulation of seed oil accumulation in soybean **Amount:** $0

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The production of drought tolerant soybean will result in better yield and quality. For market competition, Missouri farmers need to have soybean cultivars with improved drought tolerance and yield stability. With the focus of developing soybean plants with enhanced stress tolerance and seed composition, the overall goal is to generate and characterize a number of abiotic stress-related and seed development-related transcription factor conducts.

Project: Genetic modification of sterol composition in soybean seeds **Amount:** $0

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Composition

Goals: The overall goal is to develop elite soybean lines with improved nutritional quality and elevated phytosterol content by isolating and manipulating key components of phytosterol biosynthetic pathway in soybean.

Project: Translational genomics for drought tolerance in soybean **Amount:** $91,973

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The goal is to develop elite soybean lines with candidate genes from the model plant Arabidopsis that will protect and maintain the function and structure of cellular components using genetic engineering tools.

Project: Identification of genes for resistance to multi-soybean nematode species **Amount:** $89,917

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The objective is to identify and map quantitative trait loci QTL or genes conveying resistance to diseases and to determine whether the resistance to these nematode species is controlled by the same QTLs or genes.

Missouri Soybean Merchandizing Council

Project: Using microgenomics to identify new sources of soybean cyst nematode resistance in soybean **Amount:** $81,649

Investigator: Mitchum, Melissa **Organization:** University of Missouri **Category:** Pests / Nematode / Cyst

Goals: This project will study a new biotech approach to soybean nematode resistance.

Project: Evaluation of exotic germplasm for drought tolerance **Amount:** $0

Investigator: Shannon, Grover **Organization:** University of Missouri **Category:** Production / Breeding / OtherBreeding

Goals: The objective of this research is to develop new soybean varieties for Mid-South environments. The specific objectives are breeding for higher yields, disease and nematode resistance and quality traits.

Project: Genetic engineering for yield improvement in soybean **Amount:** $50,000

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The specific objectives of the research project are to produce transgenic soybean plants carrying different genes for enhancing carbon assimilation and lipid storage and characterize and evaluate new soybean plants for yield performance and oil accumulation.

Project: Evaluation of evaluated oleic acid germplasm for development of soybeans with high oleic acid. **Amount:** $79,190

Investigator: Shannon, Grover **Organization:** University of Missouri **Category:** Production / Breeding / OtherBreeding

Goals: The objective of this research is to develop new soybean varieties for Mid-South environments. The specific objectives are breeding for higher yields, disease and nematode resistance and quality traits.

Project: Development of soybeans with improved functional traits for Missouri **Amount:** $185,736

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / OtherBreeding

Goals: The objective of this research is to develop new soybean varieties for Mid-South environments. The specific objectives are breeding for higher yields, disease and nematode resistance and quality traits.

Project: Sudden death syndrome and Asian rust resistant transgenic soybean **Amount:** $112,544

Investigator: Shah, Dilip M. **Organization:** Donald Danforth Plant Science Center **Category:** Production / Breeding / Genetic

Goals: The overall goal of the project is to develop transgenic soybean engineered with antifungal proteins and to screen the transgenic plants for resistance to Sudden Death Syndrome SDS caused by Fusarium virguliforme and to Asian Soybean Rust ASR caused by Phaksopsora pachyrhizi.

Missouri Soybean Merchandizing Council

Project: Novel construct design for plant gene silencing employing artificial tasiRNA **Amount:** $83,502

Investigator: Zhang, Zhanyuan **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: This research is an effort to silence genes to prevent a negative response or in the absence of those genes, to have a positive effect on yield or stress.

Project: North Missouri soybean breeding program **Amount:** $367,288

Investigator: Scaboo, Andrew **Organization:** University of Missouri **Category:** Production / Breeding / OtherBreeding

Goals: This project involves developing new soybean varieties to be used in north Missouri maturity zones with the focus on yields.

Project: Germplasm identification and selection for soybean cyst nematode **Amount:** $82,478

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Pests / Nematode / Cyst

Goals: This research will support the discovery and evaluation of new sources of soybean resistance to soybean cyst nematode. This will lead to the development of improved soybean varieties.

Project: Support of MU weed science Extension efforts directed towards the management of glyphosate-resistant weeds **Amount:** $10,000

Investigator: Bradley, Kevin **Organization:** University of Missouri **Category:** Pests / Weed / HerbResistance

Goals: The objective is to provide growers, crop consultants, MU extension field faculty and other representatives throughout the agricultural industry with timely and accurate research-based information, recommendations, and education pertaining to the best management practices for the prevention and control of herbicide-resistant weeds in Missouri soybean production systems.

Project: Improving rumen stability of soybean meal protein **Amount:** $0

Investigator: Kerley, Monty **Organization:** University of Missouri **Category:** Utilization / Meal / Ruminant

Goals: The goal of this research is to develop a rumen-stable soybean meal that can be marketed to ruminant markets.

Project: Evaluation of germplasm and genetic mapping for flooding tolerance in soybean **Amount:** $84,640

Investigator: Shannon, Grover **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The objective of this research is to develop new soybean varieties for Mid-South environments. The specific objectives are breeding for higher yields, disease and nematode resistance and quality traits.

Missouri Soybean Merchandizing Council

Project: Is the allergen affect on pigs a myth? **Amount:** $0

Investigator: Kerley, Monty **Organization:** University of Missouri **Category:** Utilization / Meal / Swine

Goals: The goal is to determine the impact allergens in soybeans have on growth of livestock sensitive to the allergenic proteins.

Project: Development and deployment of biotechnology for soybean improvement **Amount:** $194,225

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Biotech

Goals: This project takes a holistic biotech approach to identify enabling technology traits, transformation tools and ultimately varieties that contain value-added biotech traits.

Project: CAFNR undergraduate soybean industry research scholars **Amount:** $16,000

Investigator: Parcell, Joe **Organization:** University of Missouri **Category:** Production / Management / Education

Goals: Increase the knowledge, skills, and abilities of undergraduate students to do scientific research with a soybean focus, provide new information to students and Missourians about the benefits and opportunities within the soybean industry and increase competiveness and profitability of Missouri and U.S. farmers through applied research.

Project: To develop productive group IV and V soybeans resistant to nematodes and diseases **Amount:** $238,110

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / OtherBreeding

Goals: Increasing the seed oil content in agronomic lines will not only make the crop more competitive globally, but will also expand its application toward biodiesel production or other industrial applications. Soybeans with increased oil content will be more competitive and would ensure for better economic gains for farmers.

Project: Development of soy based nanostructured materials for application as structural foams and adsorbents **Amount:** $30,300

Investigator: Kapila, Shubhen **Organization:** Center for Environmental Science & Technology, Missouri S & T **Category:** Utilization / Hulls / Hulls

Goals: The overall goal of this project is to develop a cost-competitive technology for soy hull-glycerol derived nanostructured materials. This goal will be met by completing the following objectives: experiment with varied formulations; evaluate mechanical and absorption properties of soy hull based nanostructured materials; and assess stability of the materials under varied environmental conditions.

Project: Missouri Green Fields Initiative **Amount:** $0

Investigator: Wiebold, Bill **Organization:** University of Missouri **Category:** Production / Management / Sustainability

Goals: The overall objective of this project is to develop a web site that allows Missouri farmers to compare their current soybean production practices with a scientifically-based assessment of sustainable practices. The calculated "greenness index" will be a user-friendly method for that comparison.

Missouri Soybean Merchandizing Council

Project: Assessing nutritional value of soybean meal: identifying nutritional traits that would improve market position of soybeans **Amount:** $126,915

Investigator: Kerley, Monty **Organization:** University of Missouri **Category:** Utilization / Meal / Ruminant

Goals: The goal of this research is to develop a model for evaluating nutritionally important attributes of soybean meal and rapid NIR prediction of these attributes. The objectives of this proposed research is to identify soybean cultivars that have higher energy and amino acid digestibility, to develop a model sensitive enough to determine level of improvement in soybeans selected for nutritional attributes, and to develop NIR calibrations for assessing nutritional value of soybeans meal.

Project: Identification and characterization of soybean germplasm to improve drought tolerance **Amount:** $72,003

Investigator: Fritschi, Felix **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The goal of this research is to identify soybean germplasm with increased water use efficiency and altered transpiration rates. This project should deliver germplasm critical for targeted breeding for drought tolerance based on distinct biological mechanisms and show extreme phenotypes suitable for comparative analyses and identification of genes underlying the water use efficiency and transpiration rates in soybean.

Project: Improving heat tolerance: Identification and characterization of soybean germplasm **Amount:** $90,633

Investigator: Fritschi, Felix **Organization:** University of Missouri & USD/ARS Missouri **Category:** Production / Breeding / Genetic

Goals: The goals of this project are to 1) Identify germplasm with increased heat tolerance by exploiting genetic variability of MG III and IV genotypes 2) Develop a better understanding of the mechanisms that protect soybean yield from losses during episodes of high temperature stress and 3) Initiate incorporation of heat tolerance traits into advanced soybean germplasm and development of mapping populations.

Project: Assessment of flavor scalping and/or alteration of flavor by cured epoxidized allyl soyate EAS based can coatings **Amount:** $14,545

Investigator: Kapila, Shubhen **Organization:** Center for Environmental Science & Technology, Missouri S&T **Category:** Utilization / Meal / Human

Goals: The overall goal of the project is to provide a quantitative assessment of flavor preservation by EAS resin based coatings in beverage applications.

Project: NIR analysis of variety testing and contest beans **Amount:** $15,000

Investigator: Roberts, Craig **Organization:** University of Missouri & AgBotanica **Category:** Production / Breeding / Variety

Goals: This project involves NIR testing on soybean samples.

Project: Utility of subsurface drip irrigation for soybean production **Amount:** $49,088

Investigator: Nelson, Kelly **Organization:** University of Missouri **Category:** Production / Management / Water

Goals: This project involves evaluating the effect of subsurface drip irrigation on soybean response in rotation with corn, and the effect of subsurface drip irrigation spacing on soils with slopes greater than 3% on crop response in a clay pan soil.

Missouri Soybean Merchandizing Council

Project: Genetic engineering to enhance oil traits in soybean **Amount:** $175,265

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The overall goal is to develop elite soybean lines through genetic modulation of candidate genes from plant and/or microbial sources. Efforts will be made toward increasing the oil content in soybean seeds and altering the oil quality in soybean by targeting novel genes.

Project: Management of insecticide resistance in corn earworm populations **Amount:** $69,334

Investigator: Jones, Moneen **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: To contribute sustainable soybean production via improved pest management, we propose the following specific research objectives: 1) Obtain baseline susceptibilities to commonly used as well as emerging insecticides in the field in southeast Missouri 2) Compare selection rates for resistance using mixture versus rotation strategies in the laboratory 3) Evaluate stability of resistance and number of generations required to return tolerant populations to susceptibility.

Project: Novel strategy for gene stacking through coordinated gene expression **Amount:** $83,873

Investigator: Zhang, Zhanyuan **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: It is highly desirable to stack genes for addition or improvement of multiple traits or to enhance the studies of pathways or functions of multiple genes in plant biology research. The goal of this project is to employ a novel strategy to stack genes through coordinated transgene expressions.

Project: Using soybean meal protected from rumen degradation to improve health of receiving calves and feed efficiency of stocker and feedlot calves **Amount:** $85,700

Investigator: Kerley, Monty **Organization:** University of Missouri **Category:** Utilization / Meal / Ruminant

Goals: The goal of this research is to demonstrate the economic value of RUP from soybean meal for receiving, stocker and feedlot cattle.

Project: Nutritional evaluation of soybean meal generated from high oleic acid soybeans **Amount:** $52,608

Investigator: Kerley, Monty **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The goal of this proposal is to provide nutritional information; amino acid profile, amino acid digestibility, energy digestibility of HO soybean meal for use by animal production facilities ;purchasers of soybean meal in valuing HO meal.

Project: Discovery of yield genes for soybean improvement **Amount:** $112,917

Investigator: Nguyen, Henry **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The overall goal of this project is to detect major genomic blocks and yield signatures in soybean utilizing the genome sequencing technologies.

Missouri Soybean Merchandizing Council

Project: Improving soybeans for increased productivity on specific soil types -- sand, loam and clay **Amount:** $32,000

Investigator: Shannon, Grover **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The objective of this study is to evaluate the selection and gene expression of lines planted on three diverse soil textures, and to determine whether any correlation can be made for selection regardless of soil type. These lines will also be selected to develop competitive Group IV and V soybean lines across soil types in the state of Missouri.

Project: Bioheat Technical Steering Committee **Amount:** $25,000

Investigator: Whitehead, Doug **Organization:** National Biodiesel Board **Category:** Utilization / Oil / Biofuel

Goals: This project will provide FY14 funding toward remaining technical efforts and projects identified by the BTSC which includes storage stability, low temperature impacts, and other efforts needed in order to develop and secure their approval for the legacy safe levels of biodiesel--anticipated to be B20--with No. 1 and No. 2 grades in the ASTM D396 heating oil standard.

Project: ASE certified diesel technician training and education **Amount:** $25,000

Investigator: Whitehead, Doug **Organization:** National Biodiesel Board **Category:** Utilization / Oil / Biofuel

Goals: The core of this training is to equip today's technicians with credible information about this advanced biofuel so biodiesel use is encouraged, not discouraged, as has been the case with other alternative fuels.

Project: Bioheat Technical Steering Committee - BTSC data needed to ballot legacy safe blend level **Amount:** $25,000

Investigator: Whitehead, Doug **Organization:** National Biodiesel Board **Category:** Utilization / Oil / Biofuel

Goals: Goals are to develop and provide the additional data necessary to re-ballot the allowance for up to 20% biodiesel in heating oil within the ASTM specifications.

Project: Southern blot analysis of transgenic soybean - Glycine max plants to determine transgenic status and copy number of the DGAT1 and cysteine oleosin genes **Amount:** $150,000

Investigator: Chen, Han **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: The contractor will perform Southern blot analysis of primary transgenic soybean plans to determine copy number.

Project: North Central Soybean Research Program **Amount:** $30,000

Investigator: **Organization:** **Category:** Production / Management / Education

Goals:

Missouri Soybean Merchandizing Council

Project: Costa Rica breeding project **Amount:** $150,000

Investigator: Shannon, Grover **Organization:** University of Missouri **Category:** Production / Breeding / Genetic

Goals: Winter nursery is an essential component of a successful soybean breeding and genetic program. In Costa Rica, three soybean crops can be grown each year and crossing can be made in off-season winter time in Missouri and year-round.

Missouri Subtotal of (46) Projects: **$3,260,533**

Texas Soybean Promotion Board

Project: **Amount:** $0

Investigator: **Organization:** **Category:** / /

Goals:

Texas Subtotal of (0) Projects: **$0**

Grand Total of (185) Projects: **$9,908,869**