VSB FY2020-2021 Funded Projects

Eastern Virginia AREC Soybean Research Support

Project Leader: Joseph Oakes

Total Budget: $7,500

Total Amount Funded: $7,500

Timeliness of the completion of various tasks that are a part of research programs is very important to their success. Many times, observations such as maturity dates and disease ratings must be done at a certain time or the opportunity will be lost. This project will make a significant contribution to the overall success of the soybean research programs at the Eastern Virginia Agricultural Research and Extension Center (EVAREC), which in turn will benefit soybean producers by providing accurate research-based information to assist them in management of their soybean crop.

Development of Soybean Varieties and Germplasm with High Protein Digestibility

Project Leader: Bo Zhang

Total Budget: $55,660

Total Amount Funded: $44,528

Soybean meal has been widely used in animal feed including swine, poultry, cattle, and even fish. However, soybean has several anti-nutritional factors such as trypsin inhibitors, phytic acid, raffinose family of oligosaccharides, and antigenic factors that prevent animals' protein digestibility. Processing of soybean meal requires precise control of moisture content and temperature in order to denature those anti-nutritional factors. Those extra processing steps add cost to soybean meal production. For example, roasting is applied on raw soybean meal to inactive trypsin inhibitors, so the feed cost becomes higher due to higher energy cost; and synthetic phytase is added to soybean meal to increase bioavailability of phosphorus. The most economic and reliable way to improve animals' protein digestibility is to feed them with soybean meals containing low concentration of anti-nutritional factors. However, no such commercial soybean variety is available for growers and end users. This proposed study will help to increase Virginia soybean growers' feed market share since VA farmers will firstly have access to the value-added varieties adapted to Virginia.

Use of Genomics to Develop Disease Resistant Soybeans

Project Leader: M. A. Saghai Maroof

Total Budget: $25,500

Total Amount Funded: $20,400

Diseases are major constraints for soybean production. Phytophthora root and stem rot, caused by Phytophthora sojae, is the second most important disease problem after soybean cyst nematode. Pythium damping-off and root rot is another soybean disease which results in poor stands and reduces yield. Recent disease screenings have identified 55 Pythium species. Host resistance is the most cost-effective way to manage these soybean diseases. However, resistance genes become ineffective as the pathogen populations change over time. This project aims at identification of new and novel disease resistance genes and their associated DNA markers. Improved germplasm from this study should facilitate development of superior soybean cultivars for domestic and export markets and improve profitability of US soybean producers. The long-term goal of the proposed study is to develop disease-resistant and high-yielding soybean cultivars adapted to the Virginia and the Mid-Atlantic growing conditions.

Development of High Protein Soybean Cultivars

Project Leader: M. A. Saghai Maroof

Total Budget: $18,500

Total Amount Funded: $14,800

Soybean meal has the highest level of crude protein among plant-based protein sources. One of the most important uses of soybean is protein rich soybean meal for poultry and swine feed. The current standard for high protein meal is 47.5%, which means that soybeans with a lower protein content are less valuable to processors and growers. Commercial soybean cultivars generally have values ranging from 38-42% seed protein on a dry weight basis. Therefore, increasing soybean seed protein content is a primary breeding goal. This project aims at identifying new high protein genes/QTLs and associated DNA markers with high protein to use in breeding programs to facilitate the development of soybean cultivars for domestic and export markets and improve the profitability of US soybean producers.

Atlantic Soybean Council

Project Leader: Danielle Bauer

Total Budget: $5,000

Total Amount Funded: $2,500

The Atlantic Soybean Council works to identify gaps and duplications in soybean research in Virginia, Maryland, Delaware, Pennsylvania, New York, and New Jersey. Once these gaps and duplications are

identified, synergies among researchers are created and limited checkoff funding is leveraged for maximum impact.

Agriculture in the Classroom Education and Outreach Support

Project Leader: Tammy Maxey, Senior Education Manager

Total Budget: $18,000

Total Amount Funded: $15,000

Soybeans are featured throughout the many facets of Virginia Agriculture in the Classroom's (AITC) educational programming. From curriculum covered at educator professional development training to volunteer activities for community events and direct-to-student STEM initiatives, AITC provides accurate agricultural information about the growing and processing of Virginia soybeans. For the 2020-2021 year, AITC requests support of $18,000 for educational programming and outreach, and the update and reprinting of AITC's core curriculum unit, Sprouting Success, so that we can continue to share agriculture's story with educators and children across the state.

Applied Soybean Production Research for Virginia

Project Leader: David Holshouser

Total Budget: $59,640

Total Amount Funded: $59,640

Average soybean yield response to seeding rate does not consider environmental variation. Probability tables predicting yield response to planting date and relative maturity and yield response of soybean to rotation and foliar fertilizers are needed. Varieties commonly used by farmers need to be included in the soybean OVT. I assist researchers of worthy projects in conducting experiments, publication of farmer-friendly extension-type articles, and other technology transfer. I learn and network with farmers, Extension, researchers, and crop advisers at various professional meetings. Communication and involvement with the Virginia Soybean Board and Virginia Soybean Association is necessary for good research and extension programing.

Learning to Serve the Soybean Industry

Project Leader: Dr. Ozzie Abaye

Total Budget: $7,000

Total Amount Funded: $7,000

To give students a strong background in crop analysis and engage students more fully in academics through hands-on experiences, to draw upon enhanced global perspectives as students prepare to enter agronomic careers. Compare and contrast cropping systems in Australia and South Africa and the US. Identify crops found specifically in Australia. Explain production constraints small- and large-scale farmers South African and Australia farmers face compared to US farmers. Use teamwork and leadership skills developed by working with students from Australia.

Sulfur and Nitrogen Fertility for High-Yielding Soybean Production in Virginia

Project Leader: Mark S. Reiter, Ph.D.

Total Budget: $23,890

Total Amount Funded: $15,000

Virginia will collaborate with researchers from OH, IN, MN, NC, AR, LA, GA, and WI on a multi-state project to evaluate the response of soybean to sulfur (S) and nitrogen fertilization. Individual states will request funding from their State Qualified Soybean Boards (QSSB). The Extension network lacks information related to utility of N and S application in soybean. The overall objective of this research project is to assist producers with management decisions regarding S and N yield responses as they relate to soybeans.

Development of Improved Soybean Varieties and Germplasm Adapted to Virginia

Project Leader: Bo Zhang

Total Budget: $62,811

Total Amount Funded: $50,249

Climate change and unexpected weather make it more difficult for farmers to predict yield and yearly income due to the highly variable response of currently available varieties and hybrids. Soybean varieties specifically bred, developed, and selected by breeders for Virginia will perform better under Virginia's everchanging weather conditions. Consequently, commercial soybean cultivars released by private companies may be poorly adapted to Virginia since Virginia is not their breeding selection location. The long-term goal of Virginia Tech's public soybean breeding program is to release superior cultivars to fulfill the growers' need and reduce their seed cost in order to increase their farming income.

Evaluating IPM programs for Virginia soybeans and establishing a state-wide scouting network

Project Leader: Sally Taylor

Total Budget: $20,000

Total Amount Funded: $10,000

We want to evaluate utility and profitability of insect management systems in full season and double crop soybean production fields with different maturity groups and in different regions of Virginia in 2020 to confirm and strengthen our 2019 findings. Our primary goal for the 2020 growing season is to establish a soybean scouting network that encompasses different and unique production regions in our state and alerts soybean producers to potential problems as they arise.

On-Farm Investigation and Evaluation of Soybean Production Strategies for 2020

Project Leader: Scott Reiter

Total Budget: $9,750

Total Amount Funded: $9,750

On-farm, research-based production information is used by soybean producers in Virginia to achieve maximum economic yields and increase farm profitability. Agriculture and Natural Resources (ANR) Extension Agents with Virginia Cooperative Extension will continue replicated, on-farm research trials across Virginia in 2020 using producer-cooperator partnerships. In addition to soybean variety trials at multiple Virginia locations, additional research will be conducted on-farm to address producer-identified challenges and evaluate management strategies. Results will be summarized in an Extension publication and distributed at producer meetings in the winter of 2021.

Virginia FFA Agronomy Events

Project Leader: Jennifer H Armstrong

Total Budget: $7,500

Total Amount Funded: $7,500

The Agronomy Career Development Event (CDE) offers FFA the opportunity to see our mission in action, by providing over 70 students the chance to gain knowledge and experience as they pursue careers in the field of agronomy. By networking with industry experts, judges, extension specialists and each other, the junior and senior agronomy CDE participants are exposed to the latest developments in the field of agronomy while developing team-building skills. This event demonstrates the value of pursuing a career in production agriculture.

Virginia Soybean Association Education & Promotion Proposal

Project Leader: Rachel Gresham

Total Budget: $218,778

Total Amount Funded: $202,278

The Virginia Soybean Association strives to educate consumers about the many uses of soybeans, its health benefits, sustainable production methods and the economic significance to the Commonwealth. VSA also works diligently to build relationships with consumers. Through the support of the Virginia Soybean Board, VSA continues to extend its reach to students, teachers and consumers, continually improving the relationship between consumers and producers.