SPRING 2021

CHECKPOINT

The soy checkoff's mission is to maximize profit opportunities for soybean farmers. That starts with checkoff-funded research.

Pa. Soybean Farmers Support Checkoff-Funded Research Projects

Research projects designed to increase the profitability and sustainability of Pennsylvania's soybean growers have been awarded checkoff grants totaling more than $350,000 by the Pennsylvania Soybean Board. The all-farmer board, which administers the national soybean checkoff program in Pennsylvania, approved research proposals by Penn State University researchers focusing on crop management practices and animal agriculture, the largest domestic user of soymeal and the largest sector of Pennsylvania's agricultural industry.

Soybean Response to Nitrogen and Sulfur Rate and Timing of Fertilizer Application

Historically, farmers in Pennsylvania have relied on atmospheric deposition of sulfur to satisfy the nutrient requirements of crops. However, between 2002 and 2018, sulfur deposition in the Eastern United States decreased by 81%. As a result, sulfur deficiency is a growing concern for farmers. Soybean yield is related to sulfur uptake by the plant, suggesting that a deficiency in sulfur could result in reduced yield.

Farmers must carefully consider managing the sulfur and nitrogen they supply their soybeans to achieve high yields and high quality. This research will help identify whether one sulfur (S) fertilization event can meet the needs of both a soybean and corn crop, or if there is a benefit to applying S fertilizer to both crops in the rotation. The results will aid famers in managing the sulfur supplied to their soybean crop to maximize yield and grain quality.

Proactive Monitoring and Management of Soybean Cyst Nematode

Soybean cyst nematode (SCN) is the most destructive soybean pathogen in the United States. One of the greatest challenges for SCN management is the fact that infestations and yield reductions can occur in the absence of visible symptoms. It is very common that recognizing SCN as a problem by farmers is delayed and action is not taken until nematode populations are high and more difficult to manage.

SCN spreads easily through anything that moves soils and infected root plants materials, and once it has been established in a field, larvae and encysted eggs can survive under a wide range of conditions for more than 7 years.

This project will aim to raise awareness of the risk SCN poses to soybean production and offer a free SCN testing program to proactively track SCN across Pennsylvania.

Best Management for White Mold

The persistent annual risk of white mold requires development of a proactive approach to understanding the importance of different risk factors, as well as farm-level economics to incorporate new changes on the farm. Since 1996, there has been only three years where no economic loss from white mold was documented. Farmers need to consider if, and to what extent, white mold will be a problem in their fields.

Research will investigate best management practices for the control of white mold to reduce the risk of the disease causing a significant crop loss. The ultimate goal is to provide a white mold risk assessment app that takes into consideration the high microclimate variability and production practices in Pennsylvania.

Pennsylvania On-Farm Network

Successful soybean production requires reducing the impact of soybean diseases and pests on production. In a continuing project, field trials conducted at Penn State Research Farms are validated in real life by growers on their own farms. These results are important because they present an unbiased assessment of best production practices from locally specific results.

2021 On-Farm projects will focus on:

1. Slug monitoring
2. No-till deep ripping to reduce compaction
3. Cover crop incorporation to improve nitrogen sequestration
4. Good inoculation practices
5. Ilevo seed treatment for management of soybean sudden death syndrome
6. Microbial interactions with the microbiome

Sentinel Plot Program

The sentinel plot program will be run in collaboration with Penn State Extension to provide soybean growers with statewide assessment of insects and diseases active in soybean fields.

Soybean fields in 21 counties throughout the state will be scouted weekly for insect pest and disease population. Reports of the scouting results will be reported weekly via Penn State Extension-based outlets.

The fields that are scouted are representative of most in Pennsylvania and growers can use the reports as indicators of what is active in their fields. The goal is to encourage growers to adopt Integrative Pest Management and to lower production costs by allowing farmers to avoid using unnecessary inputs.

Evaluating the Effects of Intense Precipitation on the Efficacy of Weed Management in Soybeans

With the increasing number of weed species that are developing resistance to commonly used post-emergent herbicides, soil-applied pre-emergent herbicides are becoming an essential part of an effective integrated weed management plan.

Intense rain events in spring and early summer are becoming more common. Soil-applied pre-emergent herbicides rely on rainfall to become activated in the soil, however, too much rain can result in leeching or runoff.

The research will study the amount of rain that will result in a loss in weed control and whether a cover crop can increase or decrease weed control when intense rains occur.

Molecular Assay for Simultaneous Detection of Endemic & Emerging Coronaviruses in Pigs

Coronaviruses have emerged as a major global threat to animal and human health with a marked propensity for interspecies transmission. Over the past 80 years, several novel coronaviruses have caused extensive outbreaks and economic losses in swine.

Currently there are three coronaviruses of concern to pig production globally, including an emerging swine acute diarrhea syndrome virus (SADS-CoV). Between October 2016 and 2019, outbreaks of SADS-CoV were recorded in swine herds throughout China, with a 90% mortality rates in piglets less than 5 days of age. While the SADS-CoV has not been identified in the U.S., emergence of this virus in this country could cause a devastating impact to the U.S. hog industry.

This project aims to develop rapid and specific identification tools for emerging swine coronaviruses to safeguard Pennsylvania swine through early detection and control.

Pigs are potentially at risk for emerging swine coronaviruses.

Enhancing the Nutritional Value of Soybean Meal for Lactating Dairy Cows

The study aims to demonstrate a greater supply of metabolizable protein and increased cow productivity with extruded soybean meal (ESBM) versus canola meal to show that ESBM is equal or superior in nutritive value to canola meal.

High-producing dairy cows will be fed either canola meal or ESBM extruded at 340° F as the main protein source. Milk production and composition (including milk fatty acids), nutrient digestibility and nitrogen losses, and blood amino acid profile will be recorded, as well as enteric methane production by the cows.

The project will demonstrate to dairy producers and their consulting nutritionists the advantages of ESBM over canola meal in terms of milk production and milk components and in decreasing the environmental footprint of milk, which will expand the market for soybeans and soybean meal among dairy producers.

Soybean cyst nematode females (white specks) on soybean roots. *Image: C. Grau*

SOYBEAN RESEARCH & INFORMATION NETWORK

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