JONG HAM – SOYBEAN RESEARCH PROFILE

Farmer Blog



Jong Hyun Ham, phytobacteriology and biological control professor, Louisiana State University Agricultural Center

Why did you decide to pursue a career that includes soybean research?
I started my soybean research program in 2015, so the history of this research area is quite short in my career as a plant pathologist. I decided to work on soybean research because it is a very attractive crop that can provide solutions for many challenges in sustainable agriculture and food security. The unique ability of this crop to assimilate nitrogen in the air using symbiotic bacteria makes it possible to produce enormous amounts of proteins with low economic and environmental costs. In addition, soybeans are one of the most important crops in the U.S. I initiated my research in a hope that I could contribute to the improvement of productivity through studying beneficial bacteria of soybean plants with my expertise in plant bacteriology.

What research topic have you completed in the past or are working on now that could have or has had the most significant impact on soybean production?
My research group has been working on development of bacterial formulations that enhance soybean plant growth. We initially identified more than 100 beneficial bacteria based on various biological activities involved in growth promotion. Using these bacteria, we formulated several bacterial mixtures that showed significant growth-promoting activities and yield gains through seed treatment. Moreover, seed treatment of the bacterial mixtures resulted in suppression of major soybean diseases, indicating their multiple beneficial effects on soybean plants.

How has the soybean checkoff enhanced your ability to find answers to production problems for farmers?
I really appreciate the soybean checkoffs from the Louisiana Soybean and Grain Research and Promotion Board and the United Soybean Board, which have been essential supports

for us to develop a new seed treatment technology using multiple bacterial agents. With the checkoff funds, we could also develop formulation methods for longer shelf life of the bacterial agents.

Within your area of expertise, what are the top two or three general recommendations you would offer farmers to improve their management practices?
According to our study, richness of the soil microbial community associated with soybeans is very critical for plant growth and health. I would recommend managing soil as a living material. Any management practice that reduces diversity and richness of the soil microbial community could result in long-term costs. Keeping the soil within an optimal pH range avoiding acidity and with sufficient organic material is important for maintaining a healthy microbial community.

Within your area of expertise, what do you consider to be critical soybean research needs that can impact the profitability of farmers in the future?
Modern soybean culture requires large amounts of pesticides and fertilizers for massive production with acceptable quality. However, these chemical materials are costly and could cause long-term detrimental effects on the biological and physicochemical conditions of soybean fields. For sustainable soybean production and long-term profits, future research should focus more on enhancement of soybean disease resistance and insect tolerance through better understanding of soybean defense systems and soybean-associated microorganisms.

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