

Soybeans with Increased Resistance to Sclerotinia Stem Rot and Drought Tolerance

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing transgenic soybeans with increased resistance to a highly damaging fungal pathogen, as well as improved drought tolerance.

OVERVIEW

Sclerotinia sclerotiorum is a widespread fungal pathogen that is difficult to control and can cause considerable damage to crops. In soybean, this fungus causes Sclerotinia stem rot, also known as white mold. Yield losses exceeding 10 million bushels (270 million kg) per year are common.

The disease is a major problem for crop plants in the north-central United States and southern Canada. Although soybean cultivars have been identified that show partial resistance to *Sclerotinia* infection, resistance among commercial varieties is limited.

THE INVENTION

UW–Madison researchers have demonstrated that knocking down expression of a specific soybean respiratory burst oxidase homolog protein (GmRBOH-VI) leads to enhanced resistance to *S. sclerotiorum* and confers drought tolerance.

Using protein sequence similarity searches, the researchers identified seventeen GmRBOHs and studied their contribution to *Sclerotinia* disease development, drought tolerance and nodulation. Transcript analysis of all seventeen GmRBOHs revealed that out of the six identified groups, group VI (GmRBOH-VI) was specifically and drastically induced following *S. sclerotiorum* challenge. Virus-induced gene silencing of GMRBOH-VI resulted in enhanced resistance to the fungus and, coincidentally, drought stress.

Based on these discoveries, the researchers have developed modified soybeans and production methods available for licensing.



THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



APPLICATIONS

- Production of soybean lines resistant to Sclerotinia stem rot
- Commercial cultivars

KEY BENEFITS

- Enhanced protection against stem rot/white mold
- The risk of long and severe drought is increasing worldwide.

STAGE OF DEVELOPMENT

To further the development of this work, the researchers plan to generate transgenic plants where the relevant genes are knocked down or knocked out, and evaluate the performance of the plants against a wide range of abiotic and biotic stresses.

ADDITIONAL INFORMATION

Tech Fields

Agriculture - Plant biotech

Agriculture - Crop production

CONTACT INFORMATION

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842.

