Genetic Resistance Plays Key Role in Reducing Sclerotinia Sclerotia in Soybeans

White mold, caused by *Sclerotinia sclerotiorum*, is a major disease of soybean across the northern U.S., capable of causing significant yield losses. The fungus produces hardened structures called sclerotia, which allow it to survive in the soil for many years and serve as the primary source of future infections. Managing sclerotial buildup is critical to reducing long-term disease pressure. Recent research by North Dakota State University and the University of Wisconsin-Madison examined how soybean genetic resistance to white mold affects sclerotial production, both under greenhouse and field conditions.

In greenhouse trials, a resistant and a susceptible soybean variety were inoculated with three *S. sclerotiorum* isolates of differing aggressiveness. The susceptible variety consistently developed more disease and produced more sclerotia, averaging about 55 mg of sclerotia per plant, compared to only 21 mg in the resistant variety. This equates to roughly 8 new sclerotia produced for the susceptible variety and 3 new sclerotia produced in the resistant soybean. This pattern was consistent across all isolates, showing that genetic resistance limits both disease development and the amount of new inoculum added to the soil.

Field trials in North Dakota and Wisconsin confirmed these findings. Across multiple environments, the susceptible variety produced an estimated 52.3 lb of sclerotia per acre, compared to just 6.6 lb per acre in the resistant variety. Statistical modeling showed that for every 10% increase in SSR incidence, the susceptible variety added about 25.4 lb/ac of new sclerotia, while the resistant variety produced only 14.5 lb/ac. These results highlight that planting resistant varieties can dramatically slow inoculum buildup, even in years when environmental conditions favor disease development.

While resistant varieties may not eliminate sclerotia production entirely, they can greatly reduce the long-term risk of white mold by minimizing the number of new sclerotia returned to the soil. This approach should be part of an integrated management strategy, along with crop rotation, canopy management, and timely fungicide applications in high-risk years. For fields with a history of white mold, the benefits of reduced future disease pressure and inoculum carryover make white mold-resistant soybean varieties an important tool for management.

References: Investigating the Role of Soybean Genetic Resistance on the Production of Sclerotinia sclerotiorum Sclerotia

Wade Webster, Extension Soybean Pathologist, NDSU

701-231-7057