

A Novel Source of Resistance to Peanut Stem Rot from Wild-derived Allotetraploid ValSten1 Identified by Greenhouse and Field Evaluation Methods

Y-C. TSAI*, Department of Plant Pathology, University of Georgia, Athens, GA 30605; Y. CHU, P. OZIAS-AKINS Department of Horticulture, University of Georgia, Tifton, GA 31793; T. BRENNEMAN, Department of Plant Pathology, University of Georgia, Tifton, GA 31793; D. BERTIOLI Department of Crop and Soil Sciences, University of Georgia, Athens, GA 30605; and S. LEAL-BERTIOLI, Department of Plant Pathology, University of Georgia, Athens, GA 30605.

Peanut stem rot (white mold), caused by the fungus *Athelia rolfsii* (*Sclerotium rolfsii*), is one of the most severe soil borne pathogens in US peanut production. Cultivated peanut has limited sources of resistance. Therefore, it is essential to seek stem rot resistance in wild relatives since they can be a potential resistance resource for peanut. Greenhouse bioassays and field evaluations were conducted to characterize resistance among wild-derived allotetraploid peanuts. In a greenhouse bioassay, twelve allotetraploids and two cultivated cultivars, resistant controls Georgia-12Y (GA-12Y), and susceptible control Georgia-09B (GA-09B), were evaluated three times in 2020. Disease was introduced by *A. rolfsii* mycelial plugs (0.7-cm-diameter) on sixty-day-old stem cuttings. The resulting lesion lengths were measured at 3, 5, 7, and 9 days after inoculation (DAI) and the area under the disease progress curve (AUDPC) was calculated. For 2019 and 2020 field evaluations, seven allotetraploids were evaluated with the same controls, GA-12Y, and GA-09B. Testing genotypes were transplanted under the canopy of GA-12Y as interspersed individuals with a similar microclimate. Each plant was inoculated midseason as described above, and the disease was rated during midseason and at harvest. Four allotetraploids, BatSten1 (*A. batizocoi* K9484 x *A. stenosperma* V10309)^{4x}, GregSten1 (*A. gregoryi* V6389 x *A. stenosperma* V10309)^{4x}, ValSten1 (*A. valida* PI 468154 x *A. stenosperma* V10309)^{4x}, and IpaDur3 (*A. ipaensis* KG30076 x *A. duranensis* 30060)^{4x} showed similar disease levels as the resistant control, GA-12Y, and significantly smaller lesions than the susceptible control, GA-09B. ValSten1 consistently has a similar disease level as GA-12Y and statistically lower disease rating than GA-09B. In conclusion, Valsten1 provides a new source of resistance for peanut stem rot breeding.