Identification and utilization of new sources of resistance to White Mold in wild tetraploid Arachis for peanut improvement

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Overview

Wild relatives of peanut contribute valuable traits to breeding programs, including resistance to fungal and viral diseases as well as nematodes. At the Wild Peanut Lab, we have developed a "Pipeline" to incorporate wild species genetics into elite peanut varieties. In 2024, we tested peanut lines previously developed with genetics from the wild species *Arachis stenosperma*, *A. valida*, *A. batizocoi* and *A. cardenasii* for resistance to White Mold. Most lines show statistically significant superior resistance to GA 06G, some show slight numerical superiority to GA 12Y. The most promising lines will undergo further testing in 2026. Additionally, we initiated new hybridizations between wild and cultivated peanuts, aiming to create new sources of resistance to White Mold from the wild species *A. microsperma*.

Results

We have developed two methods to evaluate White Mold resistance in wild peanut hybrids with diverse growth habits—one using cuttings in a greenhouse and another in field conditions. Selected lines from the ValSten and BatSten series were tested for resistance to White Mold in Dr. T. Brenneman's "Banana Field" in Tifton. These lines carry genetics from the wild species *A. valida*, *A. stenosperma*, *A. batizocoi*, and *A. cardenasii* and also exhibit nematode resistance. In previous tests, five of these lines have demonstrated elite field performance, with high productivity. The tests revealed useful variation in White Mold resistance, with several showing comparable resistance to GA 12Y.

Fig 1. Mean disease spread in rows inoculated with White Mold. Lines with wild genetics have blue boxes, controls are in grey. Letters above the boxes indicate statistical significance. Most lines show statistically significant superior resistance to GA 06G, some show slight numerical superiority to GA 12Y.