

PROGRESS OF AN APPLIED DISEASE SCREENING AND SELECTION PROGRAM FOR RESISTANCE TO VASCULAR WILT IN HAWAIIAN *ACACIA KOA*

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Koa (*Acacia koa* A.Gray) is a valuable tree species economically, ecologically, and culturally in Hawaii. A vascular wilt disease of koa caused by the fungal pathogen *Fusarium oxysporum* f. sp. *koa* (FOXY) causes high rates of mortality in field plantings and threatens native koa forests in Hawaii. The Hawaii Agriculture Research Center (HARC), with both public and private partners, operates a tree improvement program to develop koa wilt resistant populations in Hawaii. This applied program was started in 2003 and has made progress including the establishment of first generation seed orchards, delineation of 11 provisional seed zones, and release of the first seed with confirmed levels of genetic resistance for reforestation and restoration. Data from seedling inoculation trials and the first field trials suggest survival on infected sites may be expected to exceed 60 percent in planting using seed from the best parents compared to 30 percent or less survival in unimproved seedlings. One clonal and six seedling field trials were established between 2012–2016 using selections based on the inoculation trials. The screening method serves as a powerful tool to rapidly evaluate koa families prior to outplanting. Additional seedlings screening is on-going to identify parent trees for seed zones not yet established. This rapidly developing resistance program will need to continue the monitoring of field trials to further evaluate the durability of resistance.

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