ASIAN ASH SPECIES AS A SOURCE OF RESISTANCE TO EAB: DEVELOPMENT AND CHARACTERIZATION OF NOVEL ASH SPECIES

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ABSTRACT

No resistance has yet been identified in native North American ash species to the emerald ash borer (EAB) (*Agrilus planipennis* Fairmaire). In contrast to the situation in North America, outbreaks of EAB in Asia appear to be isolated responses to stress and do not devastate the ash population. Our work is based on the hypothesis that the Asian species of ash have evolved resistance genes and mechanisms that allow trees to coexist with the EAB. The long-term goal of our research is to introgress these resistance genes into the native North American ash species through the development of novel ash hybrids and then to perform subsequent rounds of backcrossing to recover all of the characteristics of the native North American species while maintaining EAB resistance.

Over the past 3 years, 31 different ash species combinations have been used to perform controlled cross-pollinations and 1,619 seeds were produced. Only four different species combinations resulted in viable seedlings, producing just 44 hybrid seedlings. Molecular markers, such as AFLPs and SSRs, are being used to confirm the hybrid parentage of these seedlings. At this time, we have confirmed the hybrid parentage of two seedlings (ChiAm1, ChiAm 2) from a cross between a female *Fraxinus chinensis* and a male *Fraxinus americana*. We are continuing to assess the remaining seedlings.

Comparisons between the ChiAm hybrids and their parent species showed no significant differences in the amount of foliage consumed by EAB over a 48-hour period. In contrast, significantly more EAB landings were observed on ChiAm2 than on *F. chinensis* over the same period of time, but no such differences existed in comparing ChiAm1 and *F. chinensis*. Profiles of antennally active leaf volatiles from aerated ChiAm hybrids were different from both of the parent species, *F. chinensis* and *F. americana*. The significance of these differences is being investigated.