

Breeding for Resistance to Adelgids in *Abies fraseri*, *Tsuga canadensis*, and *T. caroliniana*

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Abstract

The balsam woolly adelgid (BWA; *Adelges piceae*) and hemlock woolly adelgid (HWA; *Adelges tsugae*) have had a tremendous impact on native ecosystems with Fraser fir (*Abies fraseri* (Pursh) Poir), eastern hemlock (*Tsuga canadensis* (L.) Carrière), and Carolina hemlock (*T. caroliniana* Engelm.) in the eastern United States since their introduction from Asia. They have also caused serious economic damage in Christmas tree plantations and nurseries. The Alliance for Saving Threatened Forests is engaged in research to complement other methods of adelgid control through the development of genetically resistant Fraser fir and hemlocks. The approach focuses on the identification, testing, and breeding of resistance or tolerance found within natural populations. In addition, development of interspecific hybrids is underway, incorporating both traditional breeding techniques and somatic embryogenesis.

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