Black Walnut

Part 9. Transgenic Forest Tree Species

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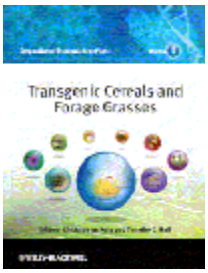
Book Title



Compendium of Transgenic Crop Plants

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Abstract

Black walnut (*Juglans nigra* L.), an important fine hardwood timber species in the eastern United States, is the subject of tree improvement efforts both by conventional breeding and bioengineering. This species is mostly used in production of fine furniture, paneling, moldings, and cabinetry. Traits such as tree height, trunk diameter, pin knots, and trunk taper can be improved by breeding and selection, but the addition of herbicide resistance, resistance to some diseases, wood color, and control of heartwood formation may more easily be achieved through bioengineering, especially when genes for these traits are not known to exist within the species' germplasm. This contribution describes efforts underway with black walnut breeding as well as initial efforts to insert marker genes through bioengineering. The author's current bioengineering work underway is directed toward achievement of herbicide resistance and reduction of sapwood. Commercial deployment of bioengineered trees in the United States will likely require control of flowering, elimination of marker genes, and scientific tests to determine potential risks. Future work will address these potential regulatory requirements.

Keywords:

transgenic; *Juglans nigra* L.; tree breeding; *Agrobacterium*; genetic engineering; bioengineering