# Propagation of *Quercus myrsinifolia* and *Quercus canbyi* by Stem Cuttings

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**Nature of Work:** *Quercus myrsinifolia* Bl. (Chinese evergreen oak) is a large, evergreen tree indigenous to Japan, southern China, and Laos (3,4). On the other hand, *Quercus canbyi* Trel. (Canby's oak) is deciduous to semi-evergreen and native to the highlands of the Sierra Madre region of Nuevo Leon in northeastern Mexico and grows as a shrub or small tree (2,5).

Specimens of *Q. myrsinifolia* and *Q. canbyi* growing on the campus of North Carolina State University, Raleigh and at the North Carolina State University Arboretum have performed well. The excellent performance of these species strengthens their potential for use in landscapes of the southern United States.

Traditionally, most species of oak (*Quercus* L.) have been propagated by seed. However, since members of this genus are extremely heterozygous, sexual propagation results in great genotypic and phenotypic variability (1). Development of efficient techniques for asexual propagation of oaks would benefit the nursery industry as this would lead to selection and production of particular clones with desirable landscape characteristics.

In a preliminary investigation, stem cuttings of *Q. myrsinifolia* and *Q. canbyi* produced robust root systems under intermittent mist following treatment with indolebutyric acid (IBA). Therefore, the following research was conducted to develop protocols for propagation of these two species by stem cuttings. Specifically, the influence of timing (growth stage) and IBA treatment on rooting were investigated.

Stem cuttings of two clones (clone 1 and 2) of *Q. myrsinifolia* and one clone of *Q. canbyi* , of seedling origin and in the adult growth phase, were taken on various dates representing specific growth stages. Cuttings of clone 1 of *Q. myrsinifolia* were collected at the semi-hardwood, hardwood, or softwood stages in addition to a transitional stage between softwood and semi-hardwood. For clone 2, stem cuttings were taken only at the softwood and transitional softwood/semi-hardwood stages. Cuttings of *Q. canbyi* were collected at the semi-hardwood, hardwood, or softwood stages. Cuttings of both species were treated with 0, 1500 (0.15%), 3000 (0.3%), 6000 (0.6%), or 9000 ppm (0.9%) IBA in 50% isopropanol. All cuttings were placed in a raised greenhouse bench and rooted under intermittent mist.

**Results and Discussion:** Semi-hardwood or hardwood cuttings of *Q. myrsinifolia* or *Q. canbyi* did not root. Responses of stem cuttings of *Q. myrsinifolia* to IBA treatment varied by growth stage. For softwood cuttings, response to IBA was quadratic with the greatest rooting noted for clones 1 (57%) and 2 (72%) when treated with 1500 and 3000 ppm IBA, respectively. Treatment with IBA had no effect on percent rooting of softwood/ semi-hardwood cuttings of clone 1, with rooting ranging from 47% to 58%.

However, a linear decrease in rooting in response to IBA was observed for clone 2 with the greatest rooting occurring for the nontreated cuttings (89%). Softwood cuttings of *Q. canbyi* responded quadratically to IBA treatment, with maximum rooting of 33% noted for cuttings treated with 1500 ppm IBA.

**Significance to Industry:** Results herein demonstrate that *Q. myrsinifolia* and *Q. canbyi*, when in the adult growth phase, can be propagated by stem cuttings which should allow selection and propagation of trees with desirable physiological and morphological characteristics. Although percent rooting of *Q. canbyi* was low (33%), additional research by the authors has demonstrated that much higher rooting is possible.

## Literature Cited

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