

## Propagation of *Quercus phillyreoides* by Stem Cuttings

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**Nature of Work:** *Quercus phillyreoides* A. Gray (ubame oak) is an attractive, ever-green species indigenous to Japan and China. It grows as a shrub or small tree reaching a height of 6 to 9 m (20 to 30 ft) (3). Although relatively unknown in the United States, it appears *Q. phillyreoides* has great potential for use in landscapes in the southern United States in addition to being well suited for urban situations. Its adaptability to southern landscapes has been supported by the excellent performance of two clones of *Q. phillyreoides* growing in the North Carolina State University Arboretum, Raleigh, N.C.

Since a preliminary investigation indicated that stem cuttings of *Q. phillyreoides* can be rooted, the following research was conducted to develop a protocol for propagation of the species by stem cuttings. Specifically, the influence of timing (growth stage) and indolebutyric acid (IBA) treatment on rooting were investigated.

Stem cuttings of two clones (clones 1 and 2) of seedling origin of *Quercus phillyreoides* in the adult growth phase were taken on four dates that represented four growth stages (semi-hardwood, hardwood, softwood, and transitional growth between softwood and semi-hardwood). Semi-hardwood and hardwood cuttings were treated with 0, 3000 (0.3%), 6000 (0.6%), or 9000 ppm (0.9%) IBA in 50% isopropanol. Softwood and softwood/semi-hardwood cuttings received the same treatments in addition to 50% isopropanol, 3000 ppm (0.3%) or 8000 ppm (0.8%) IBA in talc. All cuttings were placed in a raised greenhouse bench containing a medium of 1 peat : 1 perlite (v/v) and rooted under intermittent mist for 12 weeks.

**Results and Discussion:** Greatest rooting for both clones was achieved with softwood cuttings with 97% and 56% rooting for clones 1 and 2, respectively, treated with 8000 ppm (0.8%) IBA in talc. Six weeks later when cuttings were in a softwood/semi-hardwood condition, rooting of clone 1 was still comparable to softwood cuttings whereas negligible rooting was noted for cuttings of clone 2. For both clones, rooting of semi-hardwood cuttings was poor which was the same for hardwood cuttings of clone 2. Moderate rooting of 58% was noted for hardwood cuttings of clone 1. Auxin treatments generally increased root number. As mean root number increased mean root length decreased. Greater overwinter survival was observed for rooted softwood cuttings which produced a flush of new growth following rooting in comparison to softwood/semi-hardwood cuttings which did not flush following rooting.

**Significance to Industry:** The traditional method of propagating most species of oak (*Quercus* L. spp.) is by seed. However, sexual propagation of oaks results in great phenotypic and genotypic variability (1,2). Results herein demonstrate that *Q. phillyreoides*, 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.

#### Literature Cited

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