

# RESPONSE OF NATURAL AND ARTIFICIAL PIN OAK REPRODUCTION TO MID- AND UNDERSTORY REMOVAL IN A BOTTOMLAND HARDWOOD FOREST

Jonathan R. Motsinger

Drs. Daniel Dey and John Kabrick, Thesis Supervisors

## ABSTRACT

This study was conducted to determine whether mid- and understory removal in combination with ground flora vegetation control would result in a sufficient increase in light to foster the development of pin oak (*Quercus palustris* Muenchh.) advance reproduction without releasing non-oak competitors. Implementation of three artificial regeneration treatments (direct seeding pin oak acorns, planting 1-0 pin oak bareroot seedlings, and planting pin oak RPM<sup>®</sup> seedlings) was also conducted on these same bottomland forest sites in southeastern Missouri.

The mid- and understory removal treatment increased the amount of photosynthetically active radiation reaching the understory from 3 percent of full sunlight to 16 percent of full sunlight. This increase in light led to an increase in the proportion of pin oak advance reproduction present in the understory from 1.5 percent of all advance reproduction in control areas to 28.1 percent in removal treatment areas. Ground flora control had a negative influence on the proportion of advance reproduction as well as on survival and growth of all reproduction types.

After three years, the highest survivals were observed in RPM<sup>®</sup> and bareroot seedlings. The greatest basal diameter growth rates were observed in direct-seeded and natural seedlings and the greatest height growth rates were observed in direct seeded seedlings. RPM<sup>®</sup> and bareroot seedlings were, however, considerably larger than were the natural and direct seeded seedlings.