

EVALUATING THE EFFECTIVENESS OF GROUND COVER MANAGEMENT IN OAK PLANTINGS AND STANDS

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Ground cover management in hardwood plantings will affect early survival and growth of hardwood seedlings. Although less frequently researched, the management of ground covers in hardwood plantings can also alter the growth of saplings and pole-sized hardwood trees. Although oaks (*Quercus* spp.) have been included in several replicated studies, it is difficult to determine the impacts on, or make recommendations among, the various practices. These practices can include managing the natural ground flora; controlling the competing vegetation using cultivation, chemicals, or mulching; underplanting with less competitive legumes or grasses; or interplanting with woody nurse crops. My proposed study will utilize existing published literature to determine the growth responses of oaks to ground cover treatments and compare these growth responses to other hardwood species.

Most replicated studies involving ground cover management in tree plantings include one of two controls - plots maintained free of competing vegetation by mechanical or chemical methods, or plots where the natural ground flora is allowed to develop. A database is currently being constructed from published literature that compares multi-year responses of hardwood seedlings, saplings, or pole-sized trees to various practices as a percentage of the response to one or both of these control treatments. This database currently contains information on tree species, study location, size class and specific experimental treatments, year established, initial and final tree size and age, and whether statistically significant differences were reported. The most significant problems encountered in creating the database have been unreported seedling sizes and control treatments that show negative or little growth during the reported test period.

Preliminary analyses indicate that oak seedling and sapling responses to ground cover management practices are similar to most other trees excluding short rotation, intensive culture hardwoods and conifers. Growth of oaks in either mowed plots or plots with unmanaged natural flora averages less than 45 percent of the growth reported for oaks in vegetation-free controls. Similar comparisons reveal growth reductions of 30 percent when oaks are underplanted with forage legumes or grasses. Organic mulches and nitrogen-based fertilizers on average increase oak growth by 20 to 30 percent over oaks in vegetation-free plots. Using results from other hardwood species and with the addition of more oak entries into the database from the existing literature, it may be possible to determine if species differences exist as to how competitive different forage legumes and grasses are likely to be on saplings and pole-sized oak trees.