

A COMPARISON OF SITE PREPARATION AND SOWING TECHNIQUES FOR DIRECT SEEDING BOTTOMLAND RED OAKS IN THE LOWER MISSISSIPPI ALLUVIAL VALLEY

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Prior to European settlement, bottomland hardwood forests covered about 24 million acres in the Lower Mississippi Alluvial Valley (LMAV). Due to the rich nature of these alluvial soils and the development of flood control structures, much of this land has been converted to agricultural production. Conversion of nearly 500,000 acres of agricultural land back to forest has occurred, due primarily to the advent of government cost-share programs such as the Conservation Reserve and Wetlands Reserve Programs. Unfortunately, many difficulties have been reported in afforesting these former agricultural fields, chief among these has been poor survival of sowed acorns and planted oak seedlings. Therefore, a study was initiated to compare different intensities of site preparation and acorn sowing methods for afforesting previously farmed bottomland hardwood sites in the LMAV.

Acorns of water oak (*Quercus. nigra* L.), willow oak (*Q. phellos* L.), and Nuttall oak (*Q. nuttallii* Palmer) were planted on two wildlife management areas and two national wildlife refuges in eastern Louisiana. Six site preparation treatments, implemented on one-acre treatment plots, included no disking, strip disking, single disking before and then after sowing, and double disking before sowing. A rolling treatment was added to additional single disc and double disc treatments. Two sowing methods, one employing a Max-merge seed drill and the other a Cyclone broadcast spreader, were used to plant the acorns during the fall of 1993 and spring of 1994. Two additional treatments, hand planting and machine planting of 1-0 bareroot oak seedlings, were included in each species and site combination.

Six years after establishment, few consistent differences were found in oak density between sowing methods (seed drill versus broadcast seeding), fall sowing versus spring sowing, and sowing acorns versus planting oak seedlings. Results indicated that some degree of site preparation is needed to establish oak seedlings as the greatest number of seedlings per acre were found on the single disc and double disc treatments. Nuttall oak had greater densities than either water oak or willow oak on sites where multiple oak species were planted while water oak showed its best results with Cyclone broadcast seeding. There was a trend for the rolling treatment to increase number of oak seedlings on disced plots. These results indicate that no one prescription for oak regeneration fits all potential afforestation projects in the LMAV.