

TWENTY-YEAR PERFORMANCE IN A WHITE OAK PROVENANCE TEST

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In 1983 a limited-range provenance test for white oak (*Quercus alba* L.) was established at the Starve Hollow SRA in cooperation with the North Central Forest Experiment Station. The planting was made up of half-sib progeny of nine families/provenances representing six states from Mississippi through Minnesota. The provenances range from 34.4° through 45.0° north latitude, and the planting site at 38.5° is just south of the midpoint of that range.

Two-year-old seedlings were outplanted in six replications of four-tree family plots on an 8- x 8-ft spacing. Weed control was maintained through crown closure with herbicide. The planting was measured periodically, and thinned to the best two trees per plot after the 15th growing season. The most recent height and diameter-at-breast-height measurements were recorded following the 20th growing season when epicormic branching was also scored on a 1 (no epicormic branching) to 4 (very heavy epicormic branching) scale.

There was a strong negative correlation between latitude and both diameter and height (−0.91 and −0.89, respectively). The Mississippi provenance (34.4°), which remained cold hardy almost 300 miles north of its native range, ranked first for diameter growth at 8.13 inches d.b.h. or 115 percent of the plantation mean. It ranked fourth for height growth at 47.3 feet or 105 percent of the plantation mean. An Indiana provenance (39.1°) ranked first for height and second for diameter at 49.7 feet and 8.05 inches respectively. At the other end of the range, the Minnesota provenance (45.0°) performed poorly at 70 percent of the mean for diameter and 83 percent of the mean for height.

Growth data by itself is impressive, but it only tells part of the story. Epicormic branching is an indicator of stress within the tree and is a serious defect from a timber perspective. Scoring for epicormic branching indicated the lowest rating (fewest sprouts) for trees planted close to their native range and the highest rating for trees planted the farthest from their native range (in either direction).