

BIOMASS AND FUELWOOD PRODUCTION
OF RED MAPLE (ACER RUBRUM)
STANDS IN RHODE ISLAND

BY

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ABSTRACT

Biomass and fuelwood production were determined in the harvest of 213 red maple (Acer rubrum L.) stems from four monospecific stands growing on very poorly to moderately well drained sites in Washington County, Rhode Island.

Trees ranging in diameter from 4.1 cm to 31.8 cm were selected for harvest in a stratified random fashion, with sampling weighted according to the frequency within diameter classes. Sample trees were felled, sectioned, and separated into stemwood, branchwood, foliage, and deadwood. Components were then weighed in the field to determine green weights. Each component was subsampled to permit oven-dry weight and specific gravity determinations.

Moisture content for red maple on an oven-dry weight basis for all study areas averaged 64 percent. The average specific gravity of red maple based on 72 sample trees was 0.51 g/cc, with stemwood significantly higher in density than branchwood.

Total aboveground biomass for red maple at the four sites averaged 109,336 kg/ha, but varied considerably between sites depending upon stand age and stocking. Component percentages of stemwood biomass increased markedly with increasing age and size of trees on the study sites, whereas the proportion of branchwood biomass decreased.

Data pooled from three poorly drained sites indicated average cordwood production for red maple to be 95.2 cords per hectare with a mean annual increment of 2.13 cords per

hectare. Yields for red maple on poorly drained sites were greater than yields previously reported for mixed oaks on well drained sites and mixed hardwoods on moderately well drained sites in Rhode Island.

Allometric and linear regression equations based upon pooled data from all study sites were derived to predict tree oven-dry weight from both tree dbh (d) and dbh squared times tree height (d^2h). Allometric regression equations having R^2 values of 0.972 and 0.980 were developed to represent tree oven-dry weight as functions of d and d^2h , respectively. In comparison, R^2 values for linear regression equations were 0.864 using d and 0.983 using d^2h . A separate series of allometric d equations having R^2 values from 0.801 to 0.934 were derived for stemwood, branchwood, and foliage components of the tree. Models for estimating cordwood volume, diameter class weights, and stand weights were also developed. Tables constructed from these models provided weight and volume yields by tree size. Regression equations developed in this study for estimating red maple biomass were very similar to equations developed for red maple in Maine and West Virginia.