

Tree Improvement Program for Redwoods: Green Diamond Resource Company

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A fast growing, vigorous tree yields a higher volume log at rotation age. Higher volume translates to higher value, so a program focused on producing redwood clones that have been selected or bred for higher volume and quality is a worthwhile investment.

The program started with the selection of 300 phenotypically selected trees from across the ownership. Clones of the selected trees were then established in orchards as a clonal bank, seed orchard, and for future breeding purposes. Controlled crosses were made in a half diallel mating design with groups of six parents. Different trees reached reproductive maturity at different times, so crosses were made over several years as trees developed pollen and cones. 202 full-sibling families and 74 clones have been put in one to five of a total of 38 variety trials. Height and diameter measurements were taken at regular intervals after five, seven, ten, and fifteen years in most sites. Data is analyzed and the best performing clones have been put into tissue culture and deployed on a small scale. Response to the production process is evaluated before clones are deployed on a larger scale across the landscape. Progeny have also been evaluated and those with the best genetic prediction will be cloned and put into further tests.

25% of the clones tested so far have proved to have more volume than the woods run seedlings used as a baseline.

The tested trees have also been analyzed for heritability of desired traits. The results of these analyses will guide our future breeding program.