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Seventh Workshop on Seedling Physiology and Growth Problems in Oak Plantings (Abstracts)

D. D. McCreary and J. G. Isebrands



**North Central Research Station
Forest Service—U.S. Department of Agriculture
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St. Paul, Minnesota 55108
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D. D. McCreary and J. G. Isebrands

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REGENERATION OF NATIVE CALIFORNIA OAKS IN THE FOREST ZONE

Philip M. McDonald

USDA Forest Service, Pacific Southwest Research Station
2400 Washington Ave.
Redding, CA 96001

The two native California oaks in the forest zone of California are California black oak (*Quercus kelloggii* Newb.) and tanoak (*Lithocarpus densiflorus* [Hook. and Arn.] Rehd.). Both are ancient species with many adaptations to withstand California's Mediterranean climate, but some weaknesses as well. Both sprout vigorously from the root crown and both produce copious amounts of acorns. Sprouting has been the primary reproduction mode of approximately 90 percent of trees in existing stands. Research on oak regeneration and seedling physiology has been limited and sporadic. No major research program has been active for the last decade, although some plantings have been attempted for wildlife and recreation purposes.

Past research has documented the gain in speed and completeness of germination from point-up versus point-down acorns, the development of a long (30-inch) taproot the first growing season, the early propensity of tanoak seedlings to die back and become seedling-sprouts, and the density and development of seedling-sprouts of both species. Some manipulation of root-crown sprouts and the effect on growth and form also has been done.

Research also has shown that neither species can be established in conventional plantations in clearcuts using direct-seeded germinated acorns of tanoak and germinated acorns and container-grown seedlings (plugs) of California black oak. Irrigation, fertilizer, and shading aided tanoak survival and growth but were insufficient for establishment. Fertilizer aided black oak more than tanoak, but it too did not lead to satisfactory growth or sapling form.

It is sad that we do not know how to achieve consistent and reliable seedling growth. We suspect that shoot growth is delayed until enough water-absorbing roots are present to gather adequate soil moisture and nutrients. Shade at some level also is required. Early close-spacing probably will be needed to provide shade and straight stems.

A field test of California and Missouri regeneration techniques is planned. The California method will stress development of a seedling taproot system versus the Missouri system that emphasizes fibrous roots.