



# STATE FOREST NOTES

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## TIMBER STAND IMPROVEMENT BY POISONING BLACK OAK ON MOUNTAIN HOME STATE FOREST

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In parts of the mixed conifer type in the Southern Sierra an over-story of California black oak (*Quercus kelloggii*) interferes with the development of the understory of sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), and incense-cedar (*Libocedrus decurrens*). This broadleaf canopy is a natural plant succession prior to the domination of high conifer on many sites (fig. 1). Cutting the oak is expensive and has the additional disadvantage that, in falling, the heavy-foliaged oak trees injure or destroy many of the young conifers. Oaks that are killed without being felled naturally lose the weight of leaves. Many small and large branches rot and fall before the main stem falls, thus doing less damage to the young conifer growth than the felling of a heavy live tree would do.

Tests of poisoning black oak trees which were overtopping stands of conifer saplings 4 to 12 inches DBH were started August 24, 1954, on the Mountain Home State Forest, Tulare County, California. Tulare County Farm Advisor, Vincent H. Schweers, <sup>1/</sup> recommended the procedure and furnished on-the-ground assistance for the first trial.

The chemical used for all the poisoning was AM SOL (a 2,4-D Amine Weed Killer). This is a liquid amine formulation containing 4.0 pounds of dichlorophenoxyacetic acid equivalent per gallon, made by the Niagara Chemical Division of the Food Machinery and Chemical Corporation. This formulation is one of the least expensive of the hormone herbicides.

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<sup>1/</sup> SCHWEERS, Vincent H. 1953. Killing trees with chemicals. University of California Agricultural Extension Service, Tulare County. 4 pp. Mimeograph.



Fig. 1. Black oak trees on Mountain Home State which were poisoned in 1955 to prevent interference with the growth of the sugar pine seedlings growing under them. An axe-cut can be seen to the left of the 5x6 - inch paper.



Fig. 2. Axe-cuts at standard spacing for Mountain Home treatment to kill black oaks. The paper is 5x6 inches. The photo was taken four years after treatment.

All poisoning was done by the frill or cut-surface method similar to that described by Harvey, W. A., et al. <sup>2/</sup>. Horizontal cuts were made with a four-pound axe at a 45 degree angle. The cuts were deep enough to bite into the wood one-fourth inch or more. A twisting motion with the axe helped to make an open "frill" in the wood. The frill was filled with the undiluted 2,4-D preparation from a pump-type oil can or poured from an open can. All axe-cuts made at Mountain Home were spaced farther apart than other researchers with this process used, according to their reports <sup>3/</sup>. In 1954 about 100 trees were treated, most of them with axe-cuts spaced so that about 3 inches of undisturbed bark was left between axe-cuts (fig. 2). Wider spacings were tried, up to a spacing of 12 inches between cuts. No attempt was made to make cuts nearer the ground than was convenient to the chopper. At various times late in the summers of 1955, 1958, and 1959, black oaks were treated at locations on the Forest other than the primary test which we call Plot 11.

The results of the 1954 poisoning were uniformly successful on all spacings except those that were over 10 inches between edges of axe-cuts. All other poisoned trees began to fade in a few weeks and did not put out new leaves the following spring. Five years later the bark was beginning to fall off, but very few limbs had fallen.

In the trial test a few trees were girdled through the bark without poisoning. The girdled trees were still alive and thrifty in 1959.

The results of the 1955 poisoning work, which was on a more open site (figs. 2 and 3), were similar except that there were a few partial kills where axe-cuts were as close as 3 inches between their edges. This may have been due to failure to adequately poison one or more axe-cuts. The work was done by Conservation Camp inmates under ordinary field working conditions. The trees treated in 1958 and 1959 appear to be successfully killed after having received the standard treatment of leaving as much bark between cuts as the width of the cut.

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<sup>2/</sup> HARVEY, W. A., W. H. JOHNSON, and F. L. BALL. 1959. Control of oak trees on California foothill range. Down to Earth 15 (1): 3-6.

<sup>3/</sup> HARVEY, et al., ibid.; CARNES, E. T. and L. C. WALKER, 1956. Complete frilling essential for hardwood control. Jour. For. 54 (5): 340; GIBBS, Carter B. 1959. Amines of 2,4-D hold promise for hardwood control. Down to Earth 15 (3): 6.



Fig. 3. Same black oak trees as in fig. 2. Picture taken in September 1959.

It is our finding that to kill California black oak at Mountain Home, complete frilling is not necessary. Therefore, satisfactory results can be obtained less expensively than if the methods recommended by other investigators are adopted.