EUCALYPTUS STUMP SPROUT CONTROL

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The December, 1972, freeze severely injured top growth of an estimated two to three million blue gum eucalyptus (*Eucalyptus globulus*) in the East Bay hills of the San Francisco Bay Area of California. Due to the expected large volume of flammable regrowth, plus the huge volumes of flammable blue gum litter already on the ground (up to 100 tons per acre plus 5 tons per acre added yearly), a serious fire danger was expected. In addition, trails, views, and wildlife habitat had been obstructed because of ingrowth. A practical means of preventing basal growth of top-killed trees was clearly needed in this metropolitan area.

Australian experience in converting eucalypt forests to grazing land was not applicable: dropping fire bombs and applying soil-persistent herbicides by airplane. However, Californian experience in controlling unwanted trees in the Sierra foothills was used: a method involving the application of translocative herbicides in fresh cuts of live bark/wood tissue near the ground surface.

Trials to prevent eucalyptus trees from resprouting were initiated in 1973 and continued through 1978. All trials involved *Eucalyptus globulus,* Tasmanian blue gum, which profusely sprouts from adventitious buds located on the trunk from a few inches below ground level to the tree top. The trials included numerous herbicides, rates, and times, and several application methods. In addition, observations were recorded of mechanically removing sprouts.

Methods and Results

The ax-frill method used in these randomized and replicated trials involved making a continuous cut with a hand ax through the bark, cambium, and into live xylem of the trunk, one to three feet above the ground line. Trunk diameter varied from 1 to 24 inches. The frill was made to provide a small reservoir for the herbicide solution. Solutions applied in May were of sufficient volume to flow over the frill and moisten the surrounding soil. Basal-spray treatments were made at the same time to thoroughly wet the top and sides of the freshly cut stumps. There were three successful methods of preventing sprouts (Table 1).

Satisfactory sprout prevention was achieved (89-100%) from these three methods. Observations, however, indicated that re-treatment would be necessary where control was less than 100%. 2,4,5-T was included in this trial because of satisfactory results in Australia. It is not registered for residential use in the United States.

Treatment times for the ax-frill method average 5 to 6 minues per stump (10 to 12 stumps per hour per person). The volume of solution applied per stump averaged 0.5 ounces (250 stumps per gallon). This would be a cost/effective method where stumps are easily accessible.

No sprouting had occurred two years after 12 blue gums were felled and stumps cut to 6 inches below the soil line. A survey of where blue gum sprouts occur indicated that most sprouts originate at the ground surface and none are attached deeper than 4 inches below the ground line.

An ax-frill trial into live tissue, established in May, 1974, and evaluated in April, 1975, substantiated the efficacy of glyphosate treatments (Table 2).

The 1973 and 1974 data indicate satisfactory results can be achieved with glyphosate (3 lbs/gal) at 100% solution; re-treatment will probably be necessary if the herbicide is diluted. Retreatment may be required if 2,4-D WS amine herbicide is used, especially if diluted.

Damage was not observed on non-target vegetation growing close to ax-frill and basal-spray-treated stumps (April application). The vegetation included: *Arbutus menziesii* (Madrone), *Baccharis pilularis* (coyote bush, baccharis), *Rubus* sps. (blackberry, thimbleberry,

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Table 1. Effectiveness of sprout control on eucalyptus, 1973

Treatment	*Formulation lbs/gal*	*Percent concentration*	*Percent control*
1. Ax-Frill Method			
a. 2,4-D water soluble amine	4	50	97
b. 2,4-D water soluble amine	4	100	100
c. 2,4,5-T water soluble	4	50	92
d. 2,4,5-T water soluble	4	100	93
e. Ammonium sulfamate	5	95	89
f. Glyphosate	3	50	92
g. Glyphosate	3	100	100
2. Basal Spray			
2,4,5-T low volatile ester in diesel	4	16#/ 100 gal	93
3. Grinding off stumps to 6 inches below ground surface—no additional treatment			100

Treated April 14, 1973 and evaluated July 18, 1973.

Table 2. Ax-frill treatments 1974

Treatment	*lbs/gal*	*% Solution*	*Sprouted Stumps*	*Non-sprouted Stumps*	*% Control*
Glyphosate	3	25	0	8	100
Glyphosate	3	100	0	16	100
2,4-D WS amine	4	25	2	12	67
2,4-D WS amine		100	6	13	87

salmonberry), *Rhus diversiloba* (poison oak), *Rhamnus californica* (coffee berry), *Pinus radiata* (Monterey pine), *Quercus agrifolia* (coast live oak), *Cupressus macrocarpa* (Monterey cypress), and *Cotoneaster* spp. (cotoneaster). Spray applications made during spring growth on an area basis, using, 2,4-D WS amine, silvex, and glyphosate (all at 4 lbs per acre rate) injured these plants, but all re-grew without persistent symptoms of injury.

Alternative methods of eucalyptus sprout prevention were attempted throughout this 6-year period without success as follows:

1. Felling trees in April, making the cut within a foot of the ground surface with no subsequent treatment.
2. Pruning off and treating 1-1.5 year old sprouts at stump height from previously felled trees in winter and in summer followed by 2,4-D amine and dichlorprop/2,4-D ester/diesel applications to fresh cuts.
3. Breaking out 1 to 3.5 year old sprouts in November or in June with and without 2,4-D fresh-wound treatments.
4. Foliage applications in September of glyphosate and phenoxy herbicides.

In summary, several alternatives are offered for the successful and unsuccessful prevention of blue gum growth or regrowth. When using any pesticide, the user should adhere to label requirements. This research report does not constitute or imply a recommendation by the University of California.

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