

Control of Sprouts on Topworked Avocado Stumps with NAA Formulations¹

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Abstract. A 1% ethyl ester or sodium salt formulation of naphthaleneacetic acid (NAA) in 30% aqueous solution of white latex paint sprayed below the grafts effectively controlled trunk sprouts in topworked avocados (*Persea americana* Mill). Regrowth was suppressed over a 7-month growing period with no adverse effects on the grafts.

Topworking is practiced on a large scale in the avocado industry to convert seedling or otherwise commercially less desirable trees to superior cultivars. Considerable stump sprouting is stimulated when avocado trees are pruned for topworking. To permit good growth of the grafts, the sprouts (suckers) must be removed repeatedly until the grafts have grown sufficiently to suppress trunk re-growth, by shading of the trunks and by apical dominance of the new top. Removal of sprouts is costly and in addition, the growth of stump sprouts may inhibit the grafts.

Satisfactory control of trunk and scaffold sprouts on fruit trees and other woody plants have been reported (1–8). Boswell and Nauer (unpublished data) found that NAA applied to the trunks of topworked fig trees resulted in reduced growth of the grafts. The present work was initiated to determine if NAA³ treatments would control sprouts on topworked avocados without affecting the grafts.

'Fuerte' on 'Topa Topa' avocado seedling rootstocks were planted in San Diego County in the spring of 1972 and topworked to 'Bacon' scions in March 1975. Trunks had an average circumference of about 30 cm. 'Fuerte' trunks were cut off at about 60 cm above ground level, and 'Bacon' scions inserted using a saw-kerf procedure (9). A collar of white butcher paper was wrapped around the grafts from about 10 cm below to about 30 cm above to protect them from sunburn (Fig. 1).

We selected 105 trees for uniformity in height and girth with 35 single-tree plots per treatment in a completely randomized design. Some buds on the grafts had begun growth and trunk sprouts were 1 to 8 cm long. Two formulations, Na salt and ethyl ester of 1% NAA in 30% aqueous solutions of white latex paint were applied on April 4, 1975 with a hand pump sprayer. White latex paint was used as a carrier because it is

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³ This report does not constitute a recommendation, nor does it imply that materials tested are registered for use.

commonly applied to prevent sunburn. The entire trunks were sprayed below the collar of white butcher paper to the soil level a length of 50 cm. Check tree trunks were brush painted with undiluted white latex paint. Trunk circumferences were measured 15 cm above soil level and sprout counts were initially on April 4, and at 6, 24 and 28 weeks following application. Scion heights were measured 28 weeks after application. One replicate of each treatment was excluded from the analysis because of graft failure (Table 1). Sprouts on the trunks showed symptoms of wilting and shriveling, 2 hr after treatment with both formulations of NAA and no live sprouts remained in either NAA treatment after 45 days. Check trees averaged 19.9 sprouts. Sprouts were removed from the check trees 6 and again 24 weeks after trial initiated to increase scion growth. Wounds produced by removal of sprouts over 25 cm in length were treated with a tree seal formulation to minimize entrance of disease organisms. Check trees averaged 12.5 sprouts 24 weeks after treatment, while treated trees showed no sprout growth. Measurements made 28 weeks after treatment showed average scion heights of 127, 128, and 126 cm for the Na salt, ethyl ester and check trees, respectively. Differences were not statistically significant. Measurements of trunk circumference at 28 weeks all averaged 32. These data indicate that applications of NAA inhibited sprout growth without visible or reduction in scion and trunk growth.

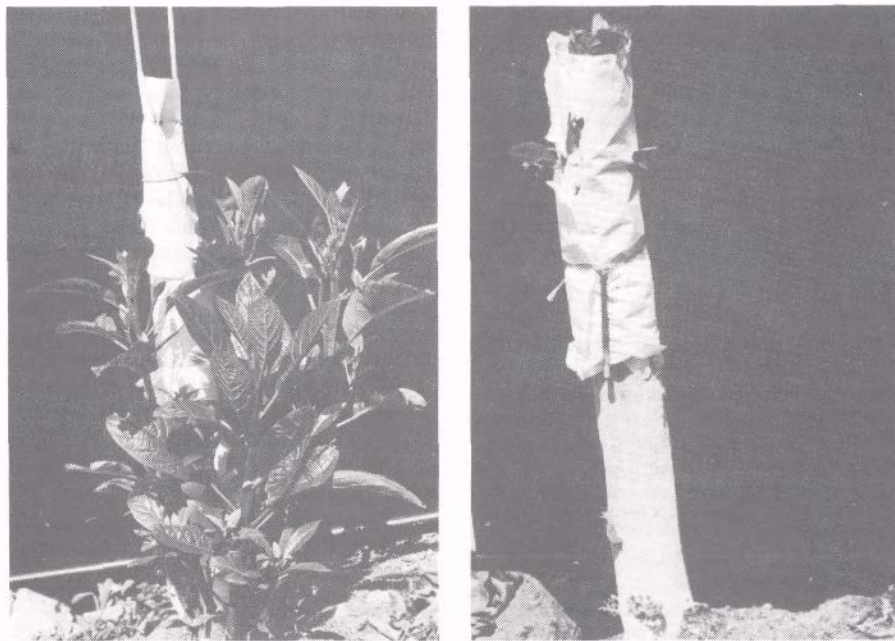


Fig. 1. Typical avocado topworked trunk 45 days after treatment. Tree treated with white latex paint only (left) tree treated with 1% ethyl ester in 30% aqueous white latex paint (right).

A precise cost comparison of the chemical and hand methods of sprout control has not been made; such will depend on a more accurate determination of optimum spray concentration and thoroughness, under various conditions, as well as on better knowledge of optimum sprout removal frequency. Our experience indicates that NAA treatment should reduce total control costs by at least one-third. Furthermore, hand removal can always be carried out later without harm to the graft, if spray treatment is delayed.

Table 1. Effectiveness of 2 formulations of NAA in white latex paint for sprout control on topworked avocado tree trunks, applied April 4, 1975.

Treatments	Mean live sprouts per trunk ^Y			
	Time after treatment (weeks)			
	0	6	24	28
Check	19.1a ^Z	19.9a	12.5b	0.0
1% Na salt NAA	18.8a	0.0c	0.0c	0.0
1% ethyl ester NAA	19.2a	0.0c	0.0c	0.0

^ZDifferent letters indicate significance at 1% level.

^YMeans of 34 single-tree replicates. Sprouts were removed from the check trees after the counts at 6 and 24 weeks after applications.

Literature Cited

1. Boswell, S. B., R. M. Burns, C. D. McCarty and Isao Iwagaki. 1975. Control of unwanted lemon trunk sprouts. *Citrograph* 60:77-78.
2. _____ and C. D. McCarty. 1974. NAA prevents basal sprouting of fig trees. *Western Fruit Grower* 28(2):24, 30.
3. _____, _____, and M. P. Miller. 1973. Chemical control of citrus stump sprouts. *Calif. Agr.* 27(1):3-4.
4. _____, _____, L. L. Ede, and J. H. Chesson. 1975. Control of lemon sprouts for mechanical harvesting. *Citrograph* 60:405-407.
5. Harris, R. W., R. M. Sachs, and R. E. Fessell. 1971. Control of trunk sprouts with growth regulators. *Calif. Agr.* 25(11): 11-13.
6. Jackson, J. E. and A. Blanco. 1974. Containment pruning and use of NAA paints. Rpt. East Mailing Res. Sta. 1973. p. 177- 179.
7. LaRue, J. H., G. S. Sibbett, M. S. Bailey, L. B. Fitch, J. T. Yeager, and M. Gerdts. 1974. NAA sprout inhibition shown in olives, pomegranates, prunes and walnuts. *Calif. Agr.* 28(9):18-19.
8. Phillips, R. L. and D. P. H. Tucker. 1974. Chemical inhibition of sprouting of pruned lemon trees. *HortScience* 9:199- 200.
9. Platt, R. G. and E. F. Frolich. 1965. Propagation of avocados. *Calif. Agr. Expt. Sta., Ext. Serv. Cir.* 531, p. 16-17.