

An occasional 1-year-old terminal on the inside of the tree was killed by X-45 at the 10% rate (but not at 5%). This should not be of commercial significance.

The 10% rate of X-77 reduced fruit set of 'Loring' trees about 40%. Fruit size, though not statistically different, showed some upward trend. The 10% rate of X-77 caused severe burning of flower buds and some leaf tip injury similar to that found with limb treatments. Additional hand thinning was required on all treatments.

While analyzing data from experiments summarized in Table 1 and 2, we found a highly significant negative correlation between the cross sectional area of the limbs and the fruit number per cross sectional area (Table 1, unthinned control limbs, $r = -0.82$; Table 2, treatments 1, 2, 3, $r = -0.63$). Fruit

Table 2. Effect of X-77 on 'Loring' peach flower bud set (1981).

X-77 Rate (%)	Fruit/limb	Fruit/cm ² cross sectional limb area	Fruit size (cm)
0	148 a ²	26 ab	2.34 ab
1	140 a	26 ab	2.39 ab
2	160 a	34 a	2.29 b
5	127 ab	23 ab	2.46 a
10	91 b	20 b	2.46 a

²Mean separation within columns by Duncan's multiple range test, 5% level.

per limb measurements are presented in Table 1 and 2 since small differences in limb diameters increased the variation between limbs of similar volume and reduced statistical separations compared to fruit per cross sectional area.

Since the airblast application did not appear to be as effective as the hand sprayer treatments, airblast and hand gun applications should be compared in future studies. Further comparisons of rates, compounds, and timing will be required to identify the most cost effective surfactants for use. The potential for these materials appears to be great since many surfactants are exempt from clearance as wetting agents and should require only a minimum of expense in order to obtain the appropriate labels.

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Sprout Control of Nonbearing Peach with NAA¹

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Abstract. Naphthaleneacetic acid (NAA) ethyl ester formulation at 0.25% plus 20% flat white latex paint applied to nonbearing peach [*Prunus persica* (L.) Batsch] tree trunks reduce sprouting, had no effect on tree growth, and did not induce gummosis.

Removal of undesirable vegetative growth on nonbearing peaches is needed to insure proper development of scaffolds and reduce possible herbicidal uptake. Extensive work with NAA has proven effective in eliminating sprouting of various crops (2, 4, 5, 6, 8). NAA on peaches as a sprout inhibitor following summer pruning proved to be phytotoxic (3). Earlier work by the authors concluded 0.5% NAA with latex on 1st leaf 'Flordaking' resulted in equivalent sprout inhibition as 1.0% but with no tree mortality (1). Though this previous study found no significant effect on tree growth from a single NAA application; NAA usage to train nonbearing peach

trees should extend for 2 years. The dual purpose of this experiment was to: 1) determine if 0.25% NAA would adequately inhibit sprouting and reduce gummosis on 1st and 2nd leaf trees compared to 0.5%, and 2) determine if 2 consecutive annual applications would affect tree growth.

An ethyl ester formulation of NAA (A-112)³ at 0.25 or 0.5% and 20% exterior latex paint was applied with a hand sprayer February 8, 1980. Care was taken to apply the minimum amount of material that insured coverage. NAA was applied from the soil line up the trunk 46 cm to 1st leaf 'Rio Grande' peach (planted January 18) in a randomized complete block design of 3 trees per replication and 3 replications per treatment. 'Rio Grande' vegetative buds were 1-2 cm long at application. Two other treatments were included. The first was removal of all sprouts from the soil line up 46 cm, 0, 1, 3, 5, 7 and 9 months after application. The second treatment was no removal of sprouts during the evaluation period.

Treatments of 0.25 and 0.5% NAA plus 20% exterior latex in 1980 were superimposed over 1979 treatments of 0.5 and 1.0% and paint, respectively, on 2nd leaf 'Flordaking' peach with the same statistical design and application date as above. 'Flordaking' trees had buds which were at first swell during treatment. The control trees were pruned once

on May 8th. This was to determine the effect pruning had on sprouting.

Tree height and trunk diameter were measured 0, 3, 5, 7 and 9 months after treatment for both cultivars. The number of sprouts from the soil line up 46 cm on 'Rio Grande' and on the trunk and 30.5 cm of 3 major scaffold branches per tree of 'Flordaking' and a subjective rating of 0 (no gummosis) to 10 (severe gummosis) were determined 1, 3, 5, 7 and 9 months following application.

The 0.5% NAA concentration caused tree mortality by the 5th month to 78% of the 'Rio Grande' trees and so is not discussed below. There was no difference among the remaining treatments in tree height or diameter throughout the duration of the experiment (Table 1). Gummosis was not significant at anytime during the experiment. An average of 0.1 sprouts or less per tree resulted from 0.25% NAA. The number of sprouts of the trees without sprout removal naturally decreased during the experiment as it did in another study (1).

Trunk diameter and tree height of the 'Flordaking' trees were not statistically different for either NAA treatment compared to the check trees for the duration of the experiment (Table 2). Some NAA-induced gummosis 1 month after application was evident but it was not statistically different from the check. Gummosis was reduced to 0 by the 9th month rating date. The number of sprouts was significantly reduced by both NAA concentrations over the untreated check for all ratings except the fifth month. This was due to the manual sprout removal on the check trees following the third month's rating. This single pruning of these trees greatly reduced the number of sprouts while in an earlier study on 2 different cultivars in 2nd leaf, unpruned check trees had an 18 to 74% increase in sprouting with no effect on vegetative growth from the 3rd to the 7th month (1). There was no advantage of the 0.5% concentration in control of sprouts over 0.25% NAA.

Tree death from the 0.5% concentration and the excellent sprout control with only slight gummosis resulting from the 0.25%

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³Mention of a trademark or proprietary product does not constitute a guarantee or warranty of the product by the University of Florida and does not imply its approval to the exclusion of other products that may also be suitable. NAA product supplied by Union Carbide Corporation Agricultural Products, New York, NY.

Table 1. Effect of manual, chemical, and no sprout removal on tree height, trunk diameter, gummosis and number of sprouts of 1st leaf 'Rio Grande' peach.¹

Treatment	Tree ht (cm)	Trunk diam (cm)	Gummosis ^y	No. sprouts
<i>A+ application</i>				
Manual sprout removal	74a ^x	1.1a	—	—
No sprout removal	70a	1.1a	—	—
0.25% NAA + latex	74a	1.2a	—	—
<i>1 month after application</i>				
Manual sprout removal	—	—	0.0a	6.0b
No sprout removal	—	—	0.0a	5.6b
0.25% NAA + latex	—	—	0.3a	0.0a
<i>5 months after application</i>				
Manual sprout removal	153a	2.7a	0.0a	0.6b
No sprout removal	161a	2.9a	0.0a	4.8c
0.25% NAA + latex	163a	2.9a	0.0a	0.0a
<i>9 months after application</i>				
Manual sprout removal	223a	5.4a	0.0a	0.0a
No sprout removal	226a	5.7a	0.0a	2.9b
0.25% NAA + latex	230a	5.8a	0.0a	0.1a

¹Manual sprout removal 0, 1, 3, 5, 7, and 9 months after NAA application on February 8, 1980.

^yVisual rating of 0 = no gummosis to 10 = severe gummosis.

^xMean separation in columns per rating date by Duncan's multiple range test, 5% level.

Table 2. Effect of 2 annual NAA applications on gummosis, tree growth and number of sprouts of 2nd leaf 'Flordaking' peach.

Treatment ¹	Trunk diam (cm)	Tree ht (cm)	Gummosis ^y	No. sprouts
<i>A+ application</i>				
Untreated check	4.7a ^x	143a	—	—
0.25% NAA	5.3a	142a	—	—
0.50% NAA	5.2a	142a	—	—
<i>1 month after application</i>				
Untreated check	—	—	0.0a	16.3b
0.25% NAA	—	—	0.9a	2.0a
0.50% NAA	—	—	1.5a	1.5a
<i>5 months after application</i>				
Untreated check	6.7a	288a	0.0a	1.1a
0.25% NAA	7.1a	303a	0.1a	1.6a
0.50% NAA	6.8a	287a	0.4a	0.4a
<i>9 months after application</i>				
Untreated check	8.7a	359a	0.0a	1.0b
0.25% NAA	9.0a	367a	0.0a	0.0a
0.50% NAA	8.6a	355a	0.0a	0.1a

¹0.25 and 0.50% NAA + 20% white latex applied 2/8/80 superimposed over 1979 treatments of 0.5 and 1.0% NAA with latex, respectively. Sprouts were removed 5/8/80 on the check trees.

^yVisual rating of 0 = no gummosis to 10 = severe gummosis.

^xMean separation in columns per rating date by Duncan's multiple range test, 5% level.

rate suggests this rate or even a lower concentration is optimum. The advantage to be gained from NAA treatments on first leaf trees is not in a more vigorous tree but to assist in training and reduce the chance of herbicidal uptake. Application of NAA would eliminate the need for laborious manual pruning also.

The first year 'Flordaking' had a gummosis rating of 6 three months after a 0.5% NAA treatment (1). These trees had sprouts 3.2 cm long at the March 12, 1979 application. The second year's data revealed a higher tolerance to a 0.5% application. Two factors that were different were tree age and the vegetative stage of growth at application. There is no apparent reason to believe the fruiting characteristics would be altered in later years. However, auxins, such as NAA have been reported to cause various changes in fruiting behavior (2). Fruiting of treated trees should be followed to fully determine NAA effect.

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