

Thinning Desertgold peaches increases fruit size

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designated as inoculated were placed two fruit halves that had received the same treatment as the other halves in the can, but each of which had a *Rhizopus arrhizus* lesion about the diameter of a dime. In tests reported here, the fruit skin over the lesion was ruptured by hand rubbing to give the NaOH solution more ready access to the enzyme within the rotted flesh.

The table gives results from several promising treatments one year after the fruits were canned. Treated fruit halves, other than the two containing dime-sized fungus lesions, were generally similar in texture to untreated, uninoculated fruit. The two inoculated halves, by contrast, generally became obviously soft within 6 to 12 months after canning.

NaOH concentrations higher than 1 N often partially removed skin from the halves or, in some cases, caused a gel formation in the syrup. Even at 1 N, contact times evidently should not exceed about 1/2 to 1 minute. Below 0.1 N NaOH, treatments were effective only when the halves were soaked in the solution for several minutes.

Conclusions

Later studies have shown that most of the enzyme activity associated with fungal lesions can be physically removed by fruit-washing procedures. A water spray from multiple jets breaks open lesions as fruits roll beneath, thus allowing a following dip or spray of NaOH solution to contact and destroy the remaining enzymes more effectively.

It thus appears that a satisfactory treatment will consist of a combination of a vigorous water-spray wash followed by a dip or spray of NaOH. Alternatively, a spray of NaOH solution, without a prior water spray, might be delivered by jets to rupture the larger fungal lesions and destroy the pectolytic enzymes in fungal lesions in a single operation. Success of the cold lye treatment will depend on maintaining the correct concentration of NaOH solution and contact time, followed by a thorough rinsing of the treated fruit.

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Each harvest begins about April 25 and continues for two weeks in the Coachella Valley. This district produces the first peach fruit of the season from California, but it is closely followed by other districts. Because the first shipments reaching market receive favorable prices, it is important to Coachella Valley growers that their peaches reach optimum market quality, particularly acceptable fruit size, as early as possible.

Many cultural operations, including proper pruning, fruit thinning, and limb girdling at pit hardening, are practiced to maximize fruit size. This experiment was conducted to evaluate the effect of reducing the number of flower buds at bud swell in January on fruit growth and final fruit size.

Vigorous, five-year-old Desertgold trees on Nemaguard rootstock were used for the experiment. A spray containing 2 percent thiourea was applied on January 20 at bud swell. The application was made as a dilute, full-coverage spray using 2.5 gallons per tree. In other areas of the world, this treatment has reportedly reduced flower buds.

Other procedures that possibly could increase fruit size were also evaluated. These included shortening the bearing shoots by one-half, removing about one-half of the flowers at 95 percent full bloom, removing every other fruit after normal hand thinning, and limb girdling.

The experiment was designed as a four-factorial, in which some level of every treatment was repeated with some level of every other, and no treatment was applied by itself. There was a total of 24 treatments in two randomized blocks.

Flower bud abortion due to thiourea treatment was apparent at 95 percent full bloom on February 9. In plots in which every other fruit was removed after normal thinning, removed fruit were counted and weighed. These data showed that, by pit hardening on March 12, the peaches were already larger on thiourea-sprayed trees (9.26 grams mean fruit weight, compared with 7.88 grams on unsprayed trees), and there were fewer fruit per tree (76 removed per

sprayed tree, 99 per unsprayed tree).

At harvest, thiourea-sprayed trees also had larger peaches (see table). Shortening of fruit wood, flower thinning, and girdling also increased fruit size, but additional fruit thinning over normal thinning did not.

Thiourea sprays at bud-swell offer a method of flower bud thinning that results in larger fruit at harvest. Shortening the fruit-bearing branches after the standard pruning and hand thinning flowers at bloom also increase fruit size. Removing every other fruit after normal hand thinning has little or no effect on final fruit size, indicating that thinning to fewer fruits per tree than is the normal commercial practice is not advisable. Girdling substantially increased fruit size and should be continued as a standard practice. The use of thiourea cannot be recommended at this time, because it is not registered for use on peach trees in the United States.

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SIZE OF DESERTGOLD PEACHES
AT HARVEST,
APRIL 27, 1976, COACHELLA VALLEY

Treatment	Mean fruit diameter* millimeters
Sprayed with thiourea	49.25 [‡]
Not sprayed	46.20
Normal pruning	46.37 [‡]
Normal plus shortening pruning	49.09
Normal thinning	46.95 [†]
Normal plus flower thinning	48.73
Normal plus every other fruit thinned	47.51
Girdled	50.90 [‡]
Not girdled	44.56

* Means of 30 fruit per tree.

† Significant at 5 percent probability level.

‡ Significant at 0.1 percent probability level.