

Spray Thinning of Olives

experimental postbloom applications of hormone NAA bring undersized fruit up to canning size

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Postbloom spray thinning of olives obtained a net gain of \$7.35 per tree in experiments during the 1951 season.

The spraying reduced the number of substandard fruit from 77% to 33%, resulting in an average net gain per tree of \$7.35. Unsprayed trees in the same orchard averaged a loss of \$0.14.

Olives in California set excessively heavy crops in some years, as in 1951. The fruit on such overloaded trees usually fails to reach canning size and must be sold for oil or be lost entirely.

During the 1946-1950 period the average return for canning olives in California was \$285 per ton while oil olives sold for \$126 per ton. Harvesting costs were about \$60 per ton in each case. In addition, trees which have excessive crops usually will bear little, if any, fruit the following year. It is to the grower's advantage to prevent his trees from setting such heavy crops. With large trees and increasing labor costs, hand-thinning may not be practical—especially on large acreages.

Since 1946, experiments have been in progress on the use of chemicals for spray thinning of olives. Tests using a wide variety of chemicals have shown that sprays of one of the growth-regulator—hormone—materials, naphthaleneacetic acid—NAA—will blossom-thin olives very satisfactorily, if applied at the rate of 30 to 50 ppm—parts per million—during full bloom. However, blossom-spray thinning of olives is not practical because at bloom the size of the crop that will set and the need for thinning is not known.

Further experiments showed that by increasing the concentration, NAA removed the small olive fruits after they had set and the size of the crop was known. The sprays must be applied during the period when there is still some natural fruit drop. The optimum time to apply the sprays to obtain partial fruit removal is about 20 to 28 days after full bloom. Spraying earlier removes more of the crop and applications later remove less.

The best concentration of NAA is 100 to 125 ppm used with a 1½% light-medium summer oil. If the oil is not used, a concentration of about 150 ppm is required to obtain adequate thinning.

The fruit drop on sprayed trees occurs two to three weeks after the spray is ap-

plied. The thinning effect is due to a physiological condition as the percentage of fruits forming an abscission layer is increased.

The material is absorbed primarily through the leaves. Treating the fruits only, or fruits and fruit stems, did not increase the natural fruit drop. Treating the leaves only or the entire shoot caused a marked increase in the number of fruits dropping. The small, weaker fruits fall while the larger ones remain.

NAA applied to olive trees at 100 to 125 ppm in a 1½% summer oil causes injury to some of the terminal buds. However, growth from uninjured terminal buds and from lateral buds provides sufficient fruiting wood for subsequent crops. There is no injury to the leaves or to the remaining fruits.

Canning tests, with olives from trees spray-thinned with NAA showed them to process normally. Trees thinned with this material bloomed and fruited normally the following year, whereas some adjacent unsprayed and unthinned trees failed to even bloom.

The advantages of postbloom spray-thinning olives with NAA are:

1. It is a rapid, easy method of thinning which can be done after the size of the crop and the need for thinning is known.
2. It results in larger, earlier maturing fruit, with a higher oil content and higher flesh-pit ratio than is obtained with unthinned fruits.
3. The thinned trees are likely to bear a crop the following year whereas unthinned trees may not.
4. The thinning need not be done every year but only when the trees set an excessive crop.

The disadvantages of spray thinning are:

1. The available time for making the spray application is limited—about one week. Spraying too early may remove too much of the crop; spraying too late may result in a waste of the materials and labor.
2. The cost of the material is high—about 40¢ for the average size bearing tree. However, the volume of spray per tree is low—the thorough spray coverage necessary in insect control is not needed.
3. Some of the terminal buds are in-

jured, but new growth arises from lateral buds. If the trees are not sprayed every year, the loss in growth may not be too serious.

Postbloom spray thinning of olives with NAA is still in the experimental stage and has been used on too limited a scale to justify recommendations for commercial use. Growers wishing to experiment with spray thinning of olives should use only a few trees until they become familiar with this procedure under their own conditions.

NAA is available through farm supply stores from spray chemical companies in several trade preparations. These are formulated primarily for preharvest sprays on apples and pears to prevent premature fruit drop.

The recommended dilution on the package usually provides a concentration of 10 ppm of NAA. When using these preparations as fruit-thinning sprays on olives, the concentrations should be increased by 10 times to provide a strength of 100 ppm. Adding 1½ gallons of light-medium summer oil to 100 gallons of the spray will increase the effectiveness of NAA.

It is very important to make the spray application at the proper time—20 to 28 days after full bloom—or with the Mission and Manzanillo varieties, when most of the fruits are about ¼" in diameter.

Experiments have shown that thinning of trees which are not overloaded is not justified. The increased fruit size does not offset the reduced number of fruits. The chief benefit of thinning is in bringing undersized fruit up to canning size.

The ideal use of fruit-thinning sprays involves an annual inspection of the orchard about three weeks after bloom and spraying the trees or parts of trees that have set excessive crops. Experienced growers usually know what is the maximum fruit set their trees can have and still develop the fruit to canning sizes. This would be approximately three or four fruits per foot of twig. The annual thinning of excessively loaded trees would do much to promote regularity of bearing in olives.

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