

2,4,5-T on Apricot

effects include early maturity,
larger fruits, less preharvest drop

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A single application of 2,4,5-T to apricot resulted in early fruit maturity, increased fruit size, reduced preharvest fruit drop, and under certain conditions development of red color in the fruit.

Accompanying these beneficial effects in some instances are certain undesirable features, both of the fruit and the trees.

Tests with this growth regulating substance on the apricot were begun in 1951. Depending upon time and concentration of the application, Royal apricots in the Green Valley area matured a maximum of 18 days early and were up to 35% larger in volume than the unsprayed fruits.

The increase in fruit size was the result of a stimulation in growth of the flesh which was up to 21% thicker than that of the unsprayed fruit. In certain instances the fruits were stimulated to grow so much and so rapidly that they split open; the split areas later became infected with brown rot and other fruit spoilage diseases. Of less consequence was the killing of the tips of vigorously growing shoots. A concentration of 100 parts of 2,4,5-T per million parts of water applied at the initiation of pit hardening combined more of the beneficial and less of the harmful effects than applications made otherwise.

Investigations during the 1952 season included semi-commercial scale application to three apricot varieties—Stewart, Royal, and Derby—under different environmental conditions. The following chemical formulations of 2,4,5-T were tested: ammonium salt, trialkylamine salt and the propylene glycol butyl ether ester. The latter formulation, at a low concentration of 12 ppm, proved to be so toxic to the fruit and foliage as to preclude its use in further experimentation.

A concentration of 100 ppm of either the ammonium or trialkylamine salts applied shortly after the beginning of pit hardening brought about fruit growth responses similar to those in 1951. Fruit volume was increased from a minimum of 25% in the Stewart variety to a maximum of 37% in the Royal variety, the Derby being in between. Measurements of the flesh showed that this portion of the fruit increased in thickness from a minimum of 9% in the Stewart variety to a maximum of 20% in the Royal. On

a fresh-weight basis, the average increase in yield of fruit was 17% for the Stewart, 22% for the Derby, and 28% for the Royal. Fruit maturity was hastened three days in the Stewart and Derby varieties and as much as 10 days in the Royal variety.

Objectionable features as a result of spray application were tiny cracks in the skin at the blossom end of the fruit or cracks along the suture that were from $\frac{1}{16}$ " to over an inch in length. This condition varied depending upon variety, location of the experiments, and time of spray application. At one location 5% of the sprayed Royal fruits developed cracks, whereas at another location 70% of the fruit of this variety were thus affected. The Derby variety was completely free of the trouble.

Under California conditions the apricot generally produces three vegetative growth flushes each year. The first and most vigorous flush is terminated during the time of pit hardening in the fruit. The second and third flushes follow during early and late summer.

Trees sprayed with 2,4,5-T failed to produce the second and third growth flushes. Growth the following year, however, was normal when 2,4,5-T was not applied. Injury to the first growth flush in the form of tip die-back also varied with location and time of 2,4,5-T application. In an orchard at Winters, only an occasional branch with tip burn could be found while in an orchard at Green Valley almost all branches were injured in this manner. Tip burning of the shoots is not particularly objectionable, however, since the regular pruning practice on mature trees generally involves their heading back or removal.

A striking effect of 2,4,5-T application in one particular orchard was the pronounced development of red color in the fruit as it matured. Under different environmental conditions, however, an identical concentration of the spray applied at approximately the same time in another orchard failed to induce red color development, although fruit size was increased and maturity hastened.

Preharvest fruit drop is a problem with some apricot varieties and apparently under certain environmental conditions. Fruit drop may begin about the time of pit hardening and continue until

maturity, or it may occur just prior to harvest. Trees sprayed with 50 ppm of 2,4,5-T were found at harvest time to have dropped only 10% of their fruits while comparable unsprayed trees dropped 30% of their crop. The spray was found to be equally effective on all varieties tested. Since 2,4,5-T application brought about a marked reduction in fruit drop during a period of 50 to 60 days, time of application for this purpose alone does not appear critical. It would appear to depend upon the type of fruit drop expected with a particular variety in a given location.

Although 2,4,5-T application appears to offer considerable promise in apricot culture, recommendations for its use can not be made until more extensive data are obtained regarding concentration and time of application under different environmental conditions and the effect of the material upon vegetative growth and fruit production when applied year after year.

Effect of 2,4,5-T Application upon Flesh Thickness in the Royal Apricot

Treatment	Flesh thickness (mm)	Increase over unsprayed (%)
Unsprayed	14.65	. . .
25 ppm	15.57	6.3
50 ppm	16.97	15.8
100 ppm	17.76	21.2

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Sprayed (s) and unsprayed (us) Stewart, Royal, and Derby apricots one month after an application of 100 ppm of 2,4,5-T on April 12, 1952.

