

2,4,5-T Sprays on Stone Fruit

tests reveal possible advantages of early fruit maturity as well as danger of injury to trees

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Spray application of 2,4,5-T—2,4,5-trichlorophenoxyacetic acid—to certain stone fruits in exploratory experiments during 1951 and 1952 resulted in early fruit maturity, increased fruit size, enhanced color and a reduced preharvest fruit drop.

Adverse effects varied from none to misshapen fruit, uneven maturity, poor flavor and severe injury or even death to the trees.

An alkanolamine solution of 2,4,5-trichlorophenoxyacetic acid—not yet commercially available—was used in experiments with cherries, plums, shipping peaches, canning peaches, nectarines and prunes.

Cherries

Various concentrations of 2,4,5-T sprays and different times of application were used on trees of Bing, Chapman, Burbank, and Black Tartarian cherries in San Joaquin County in 1951 and on Bing trees in Solano County in 1951 and 1952. None of the sprays produced any significant response as far as early maturity or increased fruit size was concerned. An application of sprays as high as 200 ppm—parts per million—brought about no adverse effects on the trees other than a temporary flagging of the foliage.

Plums

Trees of Beauty plum in Tulare County were sprayed in half-tree units on April 15 or April 28, 1952. Fruit which normally ripened on June 1 was hastened at least five days by sprays of 50 or 100 ppm on either date. The plums were of high color and normal in shape and flavor. The early ripened fruit was the same size at harvest as the unsprayed fruit was at maturity.

The tips of vigorously growing shoots were killed by the material at 50 and 100 ppm, applied April 28. Limbs of trees sprayed April 15 were not seriously damaged, probably due to a salting out of some of the active ingredient in the hard water that was used for the first spray—water softener was used in subsequent sprays. The 2,4,5-T was concentrated enough to hasten ripening but did not cause more than superficial injury to the

tree. This would indicate lower concentrations may give desirable ripening effects without tree injury.

Santa Rosa plum trees in the Arvin area were sprayed with a 2,4,5-T solution—at 40 ppm applied on April 17—60 days before normal harvest which was the most effective spray. The fruit ripened approximately two weeks early. The sprayed fruit was approximately $\frac{1}{4}$ " larger in diameter than the unsprayed fruit when both were harvested at the same maturity although there was some unevenness of ripening of the sprayed

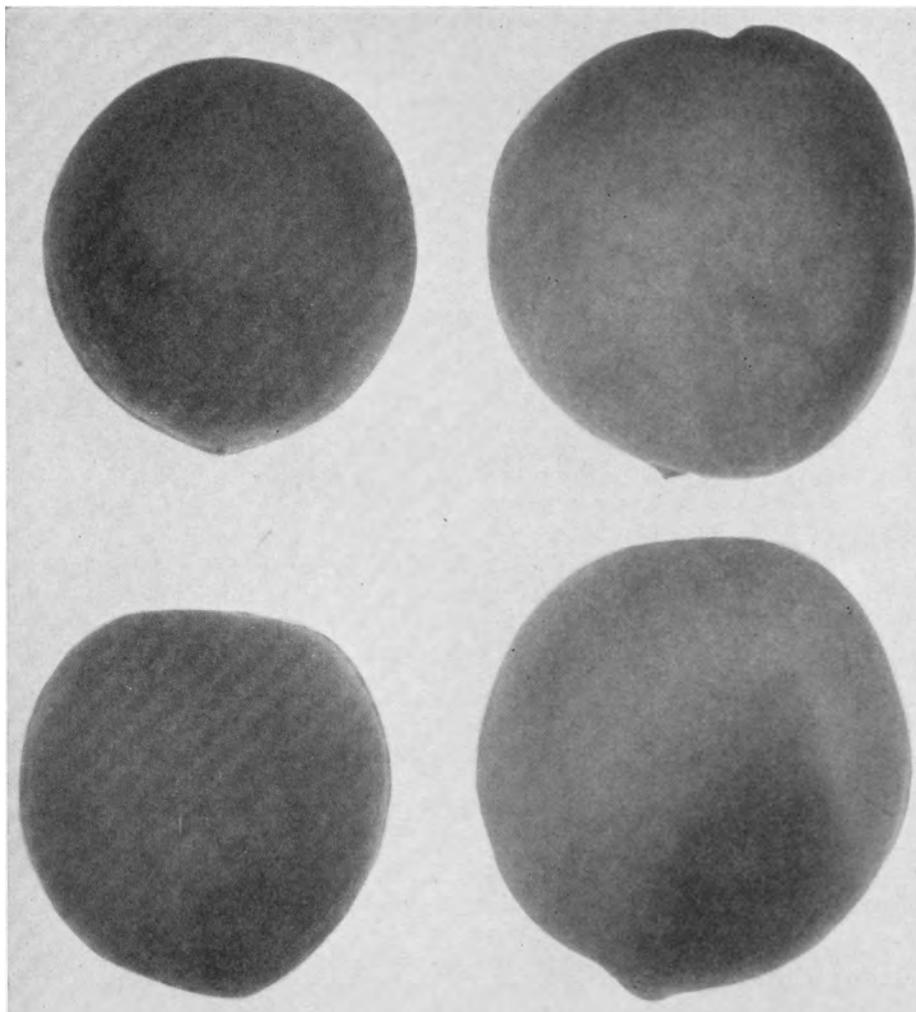
fruit. Plums held for 10 days at 40°F to simulate transit to the eastern markets, remained well colored and acceptable in flavor.

The only damage was a killing back of the vigorous shoot tips but the trees recovered and compared favorably in appearance with unsprayed trees by the end of the season.

Shipping Peaches

The early-maturing varieties of shipping peaches—Florence and Alexander

Florence peaches on the left from unsprayed tree halves compared on June 11, 1951 with fruit from the other halves of the same trees sprayed with 11 or 33 ppm of 2,4,5-T on May 17, 1951. The unsprayed peaches were as large as the sprayed fruit when they were mature a week later.



—in San Joaquin County were sprayed with 2,4,5-T in the spring of 1951.

Fruit on the sprayed half of the trees—treated with 33 ppm, a month before normal harvest—matured seven days earlier than fruit on the unsprayed half of the same trees. The fruit was of good color and flavor, and as large as the unsprayed fruit was seven days later. The Alexander peaches were highly colored by sprays of 11 ppm applied six weeks before harvest, but maturity was not affected.

During 1952 orchards of five early-maturing peach varieties—Mayflower, Florence, Golden Jubilee, Early Elberta, and Red Haven—in Fresno and Tulare counties were selected for more extensive trials. Three different concentrations—10, 20, and 40 ppm—of 2,4,5-T were applied on two or three different dates to units ranging from half a tree up to eight trees.

Except for the Mayflower, there was no significant hastening of fruit maturity that was not accompanied by objectionable deformity of the fruit. This deformity was expressed either as an enlarged suture which ripened ahead of the rest of the fruit or as bumps on the surface of the fruit which were more highly colored than the surrounding skin. The Mayflower fruit ripened up to five days early with a moderate increase in blush, only slight deformity of some of the fruit, and no impairment in flavor.

There was a slight twisting of the newly developed leaves on practically all of the sprayed peach trees. Only in the case of Early Elberta was the growth of shoots reduced. In no case was there any killing of the shoot terminals.

Canning Peaches

In trials with canning peaches, application of 25 ppm of 2,4,5-T to Carolyn peach trees 40 days before harvest reduced the drop of marketable fruit about 40% in 1951.

The same formulation was applied in 1952 on two different dates in two Andora and three Carolyn peach orchards in Butte and Sutter counties. Sullivan 1 peach trees in Tulare County and Elberta peach trees in Solano County were sprayed also.

The normal fruit drop in the Butte and Sutter orchards ranged from 1,500 to 3,000 pounds per acre. In one Andora orchard the sprays had no practical influence on the fruit drop but in the second orchard, sprays at 20 and 40 ppm applied June 26—43 days before harvest—fruit drop was reduced by 30% to 40%. The second spray—15 days prior to harvest—was without effect. The first sprays ripened the fruit in each orchard two to three days early.

Both 20 and 40 ppm of 2,4,5-T applied June 26—49 days before harvest—re-

duced the drop approximately 50% in one Carolyn orchard. In the other two Carolyn orchards, however, the 40 ppm spray applied June 26 also, almost doubled the fruit drop compared with the unsprayed trees but the 20 ppm treatment tended to reduce the drop. This contradiction was because the spray of 40 ppm ripened the peaches about four days early. In the first orchard the earlier ripened fruit was harvested before the unsprayed fruit. That was not the case in the other two orchards, and the ripening effect of the spray overcame any tendency there may have been to reduce the preharvest drop.

The quality of Andora and Carolyn fruit was not noticeably affected by these sprays, although in a few cases the early 40 ppm treatment caused some uneven ripening of a few fruits prior to harvest.

The Sullivan 1 peach trees received three different applications on June 12, 30, or July 9. These early sprays caused early uneven softening of the fruit with some splitting along the suture. The most effective treatment—but little better than no spray—was 30 ppm of 2,4,5-T applied on July 9—34 days before harvest.

The Elberta peach orchard in Solano County experienced fruit drop in excess of 10 tons of fruit to the acre. An application on July 18—three weeks prior to harvest for canning—had some ripening influence which masked any tendency to reduce the fruit drop.

Nectarines

Trials with nectarines began on April 29, 1952—54 days before normal harvest—when sprays of 2,4,5-T were applied to half-tree units of mature John Rivers nectarine trees near Fresno. Two subsequent sprays at two-week intervals were applied to different sets of trees. Fruit maturity was materially hastened by the first two sprays, but the fruit was so deformed and of such poor flavor as to preclude the use of 2,4,5-T on this variety so early in the season. The nectarines on the limbs which received 20 or 40 ppm on May 28 were highly colored, slightly advanced in maturity and normal in shape and flavor.

Shoot growth following the first spray application was markedly reduced at both 20 and 40 ppm of 2,4,5-T. There was no difference in shoot growth between sprayed and unsprayed limbs at the later two sprays.

Prunes

Applications of 20, 40, and 60 ppm of 2,4,5-T to French prunes near Santa Rosa at the initiation of pit hardening—May 10, 1952—advanced the date of maturity between two and three weeks. There was no difference in ultimate size of sprayed and unsprayed prunes. Crack-

ing of sprayed and unsprayed fruit was so severe that other observations at maturity were of little value.

Sprays of 2,4,5-TP—2,4,5-trichlorophenoxypropionic acid—as well as 2,4,5-T were applied later in the season in a French prune orchard in Napa County to see if prunes could be held on the trees and the number of pickings reduced.

A July 10 spray of 2,4,5-T at either 20 or 40 ppm was the most effective application. Over 80% of the prunes remained on the trees until harvested on August 13 while only 54% of the unsprayed fruit remained on the trees until this date. Much of the early fruit—sprayed and unsprayed—which dropped was cracked or sunburned. There was a slight early ripening effect of this spray.

The 2,4,5-TP was effective—but less so than the 2,4,5-T—in holding the prunes on the tree. It had no ripening effect. The fruit was not adversely affected by either material, except for a slight twisting of the leaves.

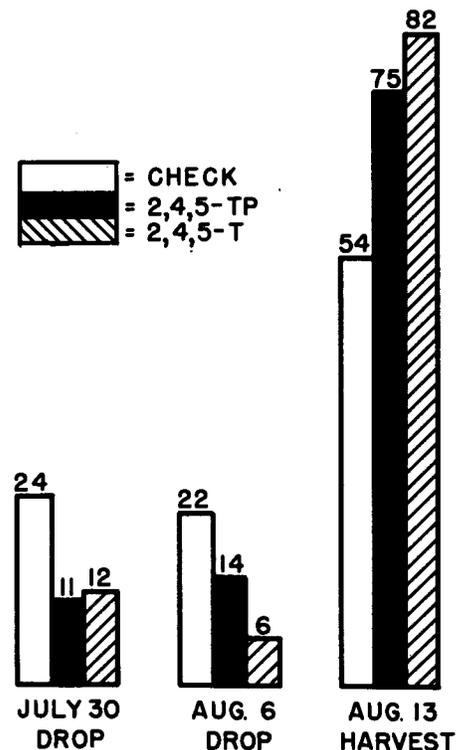
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Per cent of fruit which was picked up on July 30 and August 6 and that which was harvested on August 13 from unsprayed French prune trees and trees sprayed on July 10 with 10 ppm 2,4,5-TP or 40 ppm 2,4,5-T.