

# Blackberry Yields Increased

growth regulator sprays tested on Boysen, Olallie, and Thornless Logan varieties in San Diego County in 1955

R. S. Bringhurst, Victor Voth, and Julian C. Crane

**Seasonal average increases** of 12% to 18% in fruit yield have resulted from experimental application of growth regulator sprays on blackberries. The experiments were conducted on the Boysen, Olallie and Thornless Logan varieties at Torrey Pines in 1955. Preliminary experiments completed a year earlier on the Olallie and Boysen varieties in Santa Cruz and Stanislaus counties had given some evidence that growth regulator sprays were effective in this respect.

The sprays used contained equal proportions of NOA—beta-naphthoxyacetic—and PCPA—para-chlorophenoxyacetic—acids in concentrations of 50 ppm—parts per million—and 100 ppm of the regulators. The solution was applied to the flowers and foliage to the point of slight drip with a sprayer at 350 pressure at approximately 250 gallons per acre per application.

The plants were sprayed at full bloom and applications were repeated at approximately 10-day intervals until harvest began. Olallie plants were sprayed four times, April 25, May 3, May 12, and May 20, but the Boysen variety was sprayed only three times, May 12, May 20, and May 31. The Logan variety was sprayed four times, May 3, May 12, May 20, and May 31.

The fruit was picked in a commercial manner, and at regular intervals six baskets of field run fruit were sampled at random from each treatment. These were evaluated as representative samples of a particular harvest. The fruit in each basket was weighed and counted and the average weight per berry was determined at each sampled harvest. In addition, the average number of drupelets per fruit was determined periodically throughout the harvest period.

The average weight per fruit from the unsprayed Boysen plants was relatively uniform—about 74 milligrams—throughout the harvest season. The average weight per fruit from the sprayed plants, however, tended to increase as the season progressed. The fruit from these plants was consistently heavier than that from the unsprayed plants at every harvest date. The heaviest fruit on the sprayed plants was harvested near the end of the season—July 2—when a slight decrease in the average weight per berry had occurred on the unsprayed plants.

The percentage increases in average weight of fruit from sprayed over unsprayed Boysen plants are shown in the lower graph in this column. The fruit from the 50 ppm treatment averaged 12% and from the 100 ppm treatment 18% heavier than that from the unsprayed plants. The 100 ppm sprayed plants produced considerably heavier berries at certain harvests than those from plants sprayed with 50 ppm.

The average weight of the Olallie fruit, both from sprayed and unsprayed plants, decreased as the harvest season progressed. However, the decrease in berry weight was substantially less on the sprayed than on the unsprayed plants. The average weight per fruit from the sprayed and unsprayed plants was almost the same—about 61 milligrams—at the first harvest on June 2. As the season progressed, differences in average berry weight between treated and untreated fruits became apparent. A decrease in average berry weight of 42% occurred from the first to the last harvest of the

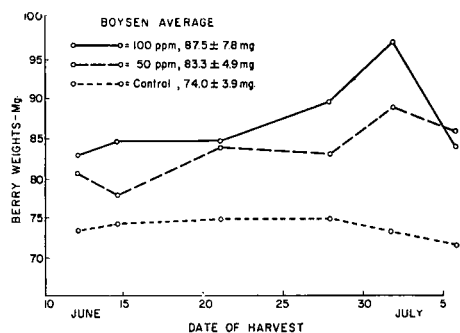
unsprayed plants, but decreases of only 13% and 19% occurred on plants that had been sprayed with 50 ppm and 100 ppm. The average increases in berry weight resulting from the sprays were similar to those obtained with the Boysen variety, 12% from the 50 ppm concentration and 16% from 100 ppm.

On the Thornless Logan variety yields from plants sprayed with 50 ppm of the growth regulators were compared with those from unsprayed plants. An average seasonal increase in fruit weight of 3% was realized. This was not significant.

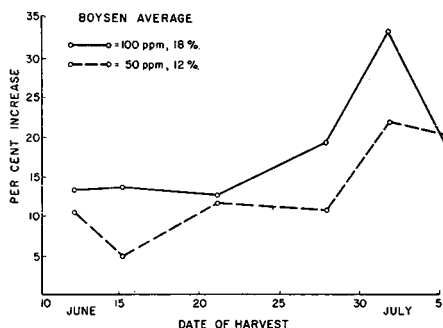
The differences in fruit weight appear to be due to increase in drupelet size since the number of drupelets comprising individual fruits was essentially the same for treated and untreated plants. Boysen had 73 plus-or-minus 10, Olallie 102 plus-or-minus 13, and Thornless Logan 106 plus-or-minus 11 drupelets per fruit.

Measured yield differences were very similar to those reported for the fruit weight.

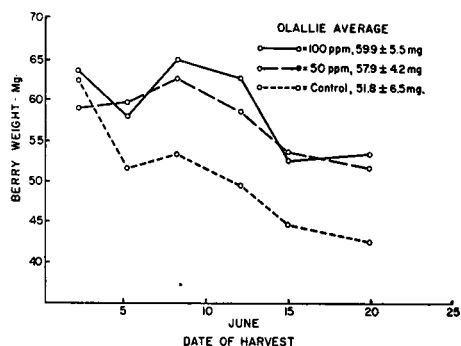
Concluded on page 15



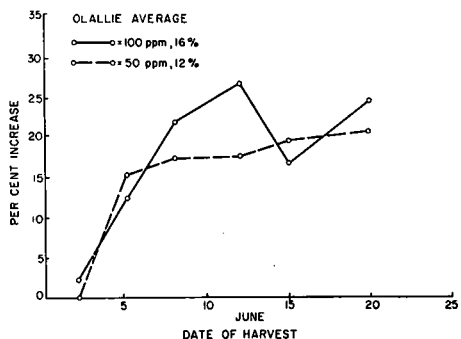
Seasonal average weight of Boysen fruits from plants treated with regulators compared with fruit from untreated plants.



Seasonal percentage increase in weight of Boysen fruits from plants treated with regulators over fruits from untreated plants.



Seasonal average weight of Olallie fruits from plants treated with regulators compared with fruit from untreated plants.



Seasonal percentage increase in weight of Olallie fruits from plants treated with regulators over fruits from untreated plants.

When used during November through February, the amount of 25% wettable powder should be increased to five pounds per acre and applied in dry weather. It is difficult to immediately determine whether or not the scales have been killed by the winter treatment until 10 days to two weeks later.

Excellent control of the scale is possible with a 3% dormant oil emulsion applied as a thorough coverage spray. To avoid injury to trees this treatment can be used only in the full dormant season, from December 20 to February 15.

*A. E. Michelbacher is Associate Professor of Entomology, University of California, Berkeley.*

*Stephen Hitchcock is graduate Research Assistant in Entomology, University of California, Berkeley.*

## BLACKBERRY

Continued from page 5

There was no evidence—throughout the season—of plant injury following spraying even on those plants that received four applications at 10-day intervals.

Further experimentation must be conducted before the best timing, the number of applications needed and the most effective concentration for large-scale applications can be determined.

*R. S. Bringham is Assistant Pomologist, University of California, Davis.*

*Victor Voth is Assistant Specialist in Pomology, University of California, Davis.*

*Julian C. Crane is Associate Pomologist, University of California, Davis.*

## PRUNES

Continued from page 6

two to four weeks before the beginning of pit hardening. One orchard in San Benito County was sprayed with 25 ppm 2,4,5-T on May 3, about a month before the pits began to harden. About 30% of the fruit dropped before they were mature. Of the fruit that remained on the tree until mature 75% were cracked.

In a Sonoma County orchard 51 trees were sprayed with 40 ppm on May 5, about two weeks before the beginning of pit hardening. Approximately half of the sprayed prunes dropped to the ground before they were mature. This fruit and that under the check trees were disked under before harvest. The fruit from the sprayed and unsprayed trees was kept separate through harvesting, dehydrating, and grading. Of the sprayed prunes harvested 30% were off-grade compared to 10% of the unsprayed fruit. Even with the severe pre-harvest loss and the offgrade fruit, the

increased size of fruit—62 prunes per pound compared to 98—made up for this loss. Deducting the cost of hand sorting and 2,4,5-T treatment, the return per tree after the second payment was the same for the sprayed as the unsprayed. No doubt many sprayed fruits which appeared normal may have shown some internal injury. The effect such an early application will have on the next year's crop of flower buds is not known.

Growers who may find it profitable to apply 2,4,5-T to apricots are cautioned to go easy on any trials with prunes. More work is needed to determine if a safe, effective time and concentration can be found for the French prune.

*R. W. Harris is Assistant Professor of Pomology, University of California, Davis.*

*C. J. Hansen is Professor of Pomology, University of California, Davis.*

*Farm Advisors Edward Bowles, Santa Clara; Jack Foott, Tulare; Roy McCallum, San Benito; Fred Petersen, Sutter; Wallace Schreder, Tehama; Enoch Torpen, Sonoma, cooperated with growers in their counties in testing 2,4,5-T.*

## SEED TREATMENT

Continued from page 3

be more severe, but tend to be more uniform with most eggs hatching at about the same time.

Area differences with fungicides seem to occur. Captan in some trials was more effective in areas where cool conditions and early plantings occurred. Chloranil showed up to good advantage in certain parts of southern California. The reasons for the differences are not readily apparent.

Insecticides should always be used with adequate fungicides because insecticides used alone on seeds may increase the incidence of seed decay from *Pythium ultimum*.

The full effects of the storage of seeds treated with the several chemicals have not been determined, and for this reason only seed of high germination should be treated and then, as close as possible to date of planting. Storage of seed for periods up to three months—under conditions not adverse to viability—is considered safe.

Tests have indicated some varietal susceptibility—of different kinds of lima beans—to damage from seed treatments. Concentrated Fordhooks seem to be the most sensitive to chemical injury, Venturas more tolerant, and baby limas the least sensitive to treatments.

Seed treated with these chemicals should not be used for food for either human beings or for domestic animals.

Some of these chemicals are quite toxic to warm-blooded animals and operators handling the chemicals should fol-

low the necessary safety precautions suggested by the manufacturers.

*W. Harry Lange, Jr., is Associate Professor of Entomology, University of California, Davis.*

*William S. Seyman is Farm Advisor, Santa Clara County, University of California.*

*Lysle D. Leach is Professor of Plant Pathology, University of California, Davis.*

*The above progress report is based upon research Project No. 1275.*

## APRICOTS

Continued from page 7

acute moisture deficiency, but six days later the foliage had completely recovered and the trees appeared normal.

Of the four growth regulators used in these tests, 2,4,5-T is superior to the others. Although 2,4,5-TP and 2,4-D brought about increases in fruit size, hastening of maturity and control of pre-harvest fruit drop, 2,4,5-TP significantly increased fruit cracking and 2,4-D killed the terminal portions of the shoots. NAA neither controlled fruit drop nor increased fruit weight to the extent obtained with 2,4,5-T.

The responses of the Stewart variety to 2,4,5-T are typical of those obtained with other commercial varieties produced in California. Although preharvest fruit drop of the apricot is a problem only with specific varieties or under certain environmental conditions, 2,4,5-T has proven to be an effective agent for its control. Whether or not the problem of preharvest fruit drop exists, the application of 2,4,5-T at the critical time brings about increase in fruit size and hastening of maturity.

Five years of experimentation with 2,4,5-T on the apricot has led to rather definite conclusions regarding the optimum time of application and the concentrations to use. To obtain maximum benefits from 2,4,5-T it should be applied at the beginning of pit hardening. The effectiveness of a particular concentration progressively decreases with successively later applications.

Hardening of the pits begins at the blossom end of the fruit and can be determined by cutting through the fruit from the blossom end toward the stem end. When the knife blade meets some resistance at the tip of the pit, it is time to apply the spray, generally 30 to 40 days after full bloom. The foliage should be sprayed to the point of slight drip as thorough coverage is important.

The proper concentration of 2,4,5-T to apply depends upon several factors, the primary one being the general area in which the orchard is located. In coastal valleys—where the period from pit hardening to maturity is relatively long—concentrations above 25 ppm

Concluded on next page