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SSSSIZING

CHERRY FRUIT

with antitranspirant sprays

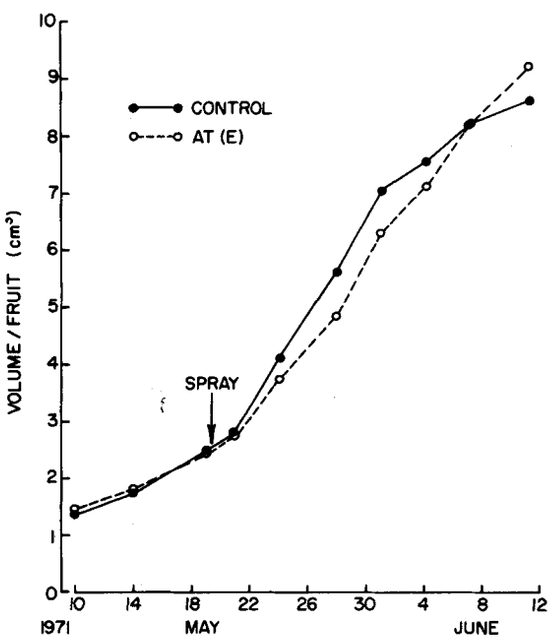
A film-forming antitranspirant sprayed on Bing cherry trees 10 days before harvest improved the water status resulting in fruit size increases of 15%, without affecting dry weight. Application too early (3 weeks before harvest) reduced dry weight, however.

EXPERIMENTS IN 1969 to 1971 had shown that the water status of peach and olive trees could be improved by an antitranspirant sprayed one or two weeks before harvest. This significantly increased fruit size. Since the antitranspirants slow photosynthesis as well as transpiration the spray should be applied when fruit growth depends more on a high water potential in the tree than on the accumulation of photosynthates.

In these tests, the antitranspirant RD-9 from Mobil Oil, was used on an experimental basis for the purpose of increasing fruit size of cherries. This material has not yet received EPA approval, although efforts toward approval are being made. Therefore, the results presented indicate the potential of this material for fruit sizing and are not intended as a recommendation at this stage.

The RD-9, diluted in water at 1:8, v/v, was sprayed with a back-pack mist blower at the rate of six liters per tree. Three trees were given an "early" spray (on May 19), and two other trees a "late" spray (on June 1). Three trees were left unsprayed (control). Pre-spray fruit measurements began on May 10, when the fruits were about 1.5 cm^3 in volume and were still green; harvest was on June 11. Fruit growth (diameter measured with calipers) was determined on 30 tagged fruit per treatment. The

GRAPH 1. EFFECT OF "EARLY" ANTI-TRANSPIRANT SPRAY ON GROWTH OF BING CHERRY FRUIT



GRAPH 2. EFFECT OF "LATE" ANTI-TRANSPIRANT SPRAY ON GROWTH OF BING CHERRY FRUIT

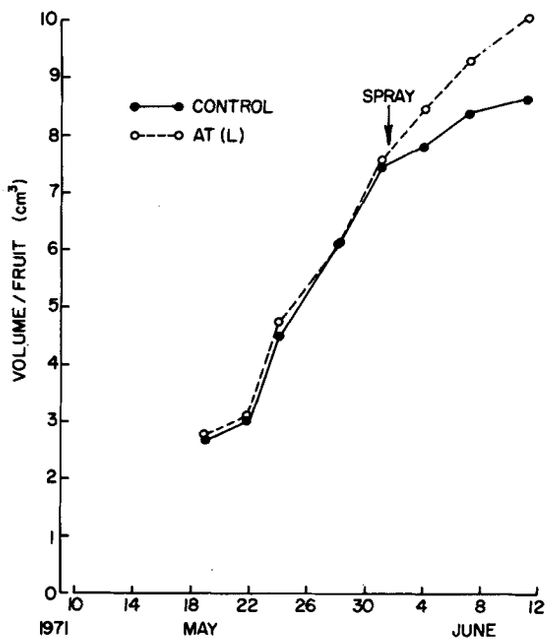


TABLE 1. EFFECT OF ANTITRANSPIRANT ON FINAL VOLUMES OF BING CHERRY FRUIT (1971)

	Volume on spray day (5/19)	Growth (5/19–6/11)	Volume on Harvest day (6/11)	Increase in final volume
		mm³/fruit		
CONTROL	2500	6088	8588	...
AT (early)	2500	7066*	9566	11.5
SEM±			244	
P <			0.05	
	(6/1)	(6/1–6/11)		
CONTROL	7500	1163	8663	...
AT (late)	7500	2462*	9962	15.0
Pooled Std. Dev. ±			966	
P <			0.001	

* Adjusted for prespray variation in growth rate from that of the control.

TABLE 2. EFFECT OF ANTITRANSPIRANT ON BING CHERRY DRY WEIGHT, SOLUBLE SOLIDS, AND MOISTURE CONTENT AT HARVEST (6/11/71)

	Days before harvest	Dry weight (Grams/ 30 fruit)	%	Soluble solids*	Moisture content – fw basis†
	No.			%	%
CONTROL	...	46.9	100	17.1	81.6
AT (early)	22	39.5	84	14.0	84.9
AT (late)‡	10	45.7	98	15.1	83.5

* Measured at 1000–1430 h on 6/11.
† Samples collected at 1600 h on 6/11.
‡ Treatments were significantly different ($P < 0.01$).

diameters were then converted to volumes, assuming the fruit to be a sphere.

Earlier experiments on other fruit crops provided ample evidence that an antitranspirant spray, applied to the stomata-bearing surfaces (underside) of leaves to form a film, greatly increases resistance to escape of water from the leaves, raising their water potential and improving the water status of the tree as a whole. This can enhance fruit growth rate.

Effects on fruit growth

The effect of the "early" antitranspirant spray is shown in graph 1. Before the spraying, all of the fruit grew at the same rate. After spraying, the fruit on the "early" treated trees enlarged more slowly than fruit on control trees until about one week before harvest. Then the treated fruit greatly exceeded the controls in growth rate, with the result that they were larger than controls on harvest day.

The "late" spray (graph 2), in contrast, enhanced growth rate immediately, so that by harvest these fruit were considerably larger than the controls. From graphs 1 and 2 it can be concluded that applying an antitranspirant too early (about three weeks before harvest) can interfere with fruit growth because of the importance of photosynthesis at this stage. Applying an antitranspirant later (about 10 days before harvest), however, results in increased fruit growth because sizing at this stage is more dependent on maximum plant-water potential than upon the accumulation of photosynthates.

Plant water

Even so, graph 1 shows the importance of plant water potential in the later stages of development. Unlike the controls, the growth curves of fruit from treated trees had not flattened off by June 11. This suggests that the antitranspirant may delay maturity, which could be important for staggering the harvest.

Since the rates of fruit growth prior to spraying were the same for all of the trees, it is safe to assume, for simplicity, that all fruit on the two respective spray days were the same size, i.e., 2500 mm³ on May 19 and 7500 mm³ on June 1. The volume growth per fruit between spraying and harvest, and the final volumes on harvest day are shown in table 1. The early and late antitranspirant applications increased final fruit volume by 11.5 and 15%, respectively.

As expected, the early spray reduced fruit dry weight, by about 16% (table 2). Both treatments reduced soluble solids slightly, but since this is a refractometric determination, the lower values for antitranspirant treatments may be partly due to a dilution effect caused by the higher moisture contents of treated fruit.

Postharvest effects

Since antitranspirant sprays are still under experimentation for fruit sizing, no recommendations can be made. The wax film on the cherry fruit does not improve its appearance, but it could possibly be buffed off after harvest. One advantage in the persistence of the film on the fruit after harvest is that it reduces postharvest desiccation by as much as 50%. This would help maintain plump fruit during shipment and marketing.

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ORNAMEN

...influences

SEEDLINGS AND SMALL PLANTS are often maintained in small pots under reduced or low nutritional levels to prevent rapid growth. The rationale for this practice is to prolong marketability of the small plants. The argument goes that too rapid growth results in the plants becoming excessively pot bound or "overgrown" quickly, thus reducing the market life of the plants. It is further argued that reduced nutrition does not influence subsequent growth rate.

Observations

Observations seem to substantiate this contention: excessively pot bound plants grow at a slower rate than plants not pot bound when subsequently transplanted into larger containers or into the field. This effect has been reported even when root pruning and other techniques were used to alleviate the "pot bound" condition. This reaction has not, however, been demonstrated for all plant species.

Transplant timing

To further study the problem, and to begin to develop data on optimum time for transplanting, two tree species—*Eucalyptus viminalis* and *Jacaranda acutifolia*—were selected. The influence of fertility level, duration in small, hard-wall (2¼ inch clay) pots, and pruning of roots at transplanting on subsequent growth of the plants was studied. Two fertility levels were tested: no fertilizer and a moderate fertility level sufficient for sustained plant growth. At transplanting to 1-gallon containers, the roots of some plants were pruned by cutting all roots on the surface of the root ball.

The experiment was conducted during the fall, winter and spring. Growth of the jacaranda plants was restricted because of the naturally short photoperiods of that time of the year. Thus the data