Prune Size Affected by 2,4,5-T

erratic response in fruit size obtained after experimental treatment of mature trees with sprays of growth regulator

R. W. Harris and C. J. Hansen

Fruit size was not increased uniformly in all of the 1955 trials in which mature French prune trees were sprayed with 2,4,5-T. The increase in the fresh weight of sprayed prunes varied from none up to 23%.

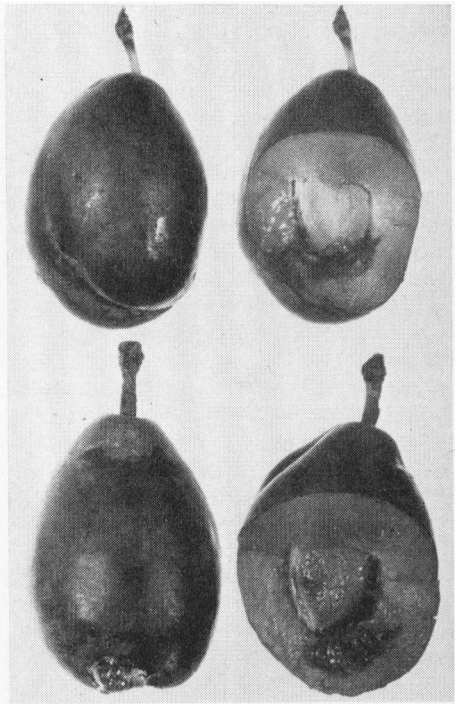
Fruit size was increased up to 20% in exploratory trials during 1954 in Santa Clara and Yolo counties. Sprays of 25 ppm—parts per million—and 50 ppm of 2,4,5-T—triethylamine salt of 2,4,5-trichlorophenoxyacetic acid—were applied to large limbs of mature trees just before or during the pit hardening stage of fruit development. These sprays caused some fruit injury and shoot dieback. The earlier and more concentrated the spray the more serious was the injury.

In the Davis trials during 1955 entire French prune trees were sprayed on May 5, 11, and 19. The tips of most of the pits had begun to harden by May 7. The entire pit was hard in most of the prunes by May 19. The trees were not uniform enough in size and amount of fruit set for the average yields of five trees to have much meaning. However, the yield data are helpful in interpreting the effects of 2,4,5-T on the size of these prunes.

All of the sprays increased the fresh weight of the prunes, from 8% to 23%. In all probability, the only cases where the yield may have greatly influenced the size of fruit were the two sprays applied on May 11. The 20 ppm probably would have appeared more effective in increasing fruit size if the trees had not been carrying such a heavy crop. On the other hand, the 40 ppm spray might have appeared less effective if the trees had had a heavier crop.

On the same dates that the entire trees were sprayed, other sets of trees were sprayed with 40 ppm 2,4,5-T so that half of a tree was sprayed and half unsprayed. When fruit from the sprayed half of each tree was compared to that of the unsprayed half, increases in size similar to that of the entire tree applications resulted. Increases of 19%, 13%, and 16% in the fresh weight followed the 40 ppm application to half trees on May 5, 11, and 19 respectively.

As far as increasing the size of prunes in this trial, there was little difference between the effectiveness of the two concentrations or the three dates of application.



French prunes injured by 50 ppm 2,4,5-T applied on May 1, 1954. Prunes on left show sunken discolored area along suture; the lower prune has exuded gum. On right, same fruit cut to show internal discoloration and gum.

This was not the case for the amount of injured fruit or the amount of fruit which dropped before harvest. The first two sprays, May 5 and 11, caused more fruit injury and fruit drop than did the last spray on May 19. The 20 ppm spray was less toxic than the 40 ppm.

By the early part of June some of the fruit on the sprayed branches had begun to show injury. Dark purple sunken areas appeared on the tip half of the prunes, and the flesh was discolored beneath these areas, sometimes to the pit. Gum exuded from the more severely injured fruits. The number of injured fruits per 100 was counted on July 5. Most of the fruit that was injured early dropped before harvest and accounted for most of the preharvest drop of prunes. At harvest 9% to 15% of the sprayed fruit was cracked, gummy, or discolored. Even some of the sprayed fruit, 23%–33%, which appeared normal on the outside, had darkened areas in the flesh or along the pit suture. Less fruit from the trees sprayed on May 19 at 20 ppm was damaged than from the earlier or more concentrated sprays.

In addition to the trials at Davis in 1955, farm advisors and growers in several of the prune growing counties tested 2,4,5-T. These orchard trials gave quite varied results. The 2,4,5-T—20 ppm and 40 ppm—was applied at the start of pit hardening to three to six trees in each of 23 orchards. In only three out of the 17 trials where fruit size was measured at harvest was there a significant increase in fruit size. Few fruits or shoots were injured in any of these trials.

Fruit and shoots were seriously injured in two orchards that were sprayed

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The Effect of 2,4,5-T Sprays on the Weight, Drop, and Injury of French Prunes Davis, 1955

Values are averages of five trees

2,4,5-T application		Yield		Fruit weight		Fruit drop before harvest	Externally injured fruit		Internal but no external injury at harvest
				Fresh Increase over unsprayed	Dry*		July 5	at harvest	
Date	Conc. ppm	lbs/tree	gms/fruit	%	No/lb	%	%	%	%
May 5	0	322	20.4	0	71	..	..	3	0
	20	348	23.7	16	62	13	18	9	26
	40	292	23.1	13	60	21	29	11	33
May 11	0	499	19.2	0	74	..	..	3	1
	20	550	20.8	8	78	16	8	14	23
	40	206	22.8	19	56	19	25	15	27
May 19	0	252	18.5	0	69	..	..	3	1
	20	235	22.8	23	55	5	2	3	12
	40	251	22.6	22	57	2	6	14	26
Least significant difference									
		5%	2.7	13	..	14	13	6	10
		1%	3.6	18	..	19	18	9	14

* Samples composited from five trees for dehydration. Data could not be analyzed statistically.

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.

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BLACKBERRY

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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.

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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 offgrade compared to 10% of the unsprayed fruit. Even with the severe preharvest 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.

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

SEED TREATMENT

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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 follow the necessary safety precautions suggested by the manufacturers.

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

APRICOTS

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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 preharvest 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

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