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Effects of Fruitone CPA on Thinning Peaches in Texas

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Summary

In 1969 and 1970, Fruitone CPA was sprayed on peach trees to determine its effectiveness for thinning peaches. Concentration rates were 0, 150, and 300 parts per million (ppm). Fruitone CPA caused fruit thinning, but the results were erratic. Factors other than concentration rates apparently influence the effectiveness of this chemical as a peach thinner.

Introduction

Next to citrus, peaches are the most important Texas fruit crop. Because of several problems, however, Texas produces less than one-half of the peaches consumed in the state. A major production problem is setting too much fruit per tree. Many chemical compounds have been evaluated as economical peach thinning agents (2, 3, 4), but none have been consistently adequate. One of the more recent materials offered for trial is Fruitone CPA [2-(3-chlorophenoxy)-propionamide] [2-(3-chlorophenoxy)-propionic acid]¹. To increase the quality of the peaches and to find an alternative to hand thinning of peach fruit, the effectiveness of CPA as a thinner was evaluated under conditions in Texas.

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¹Manufactured by Amchem Products, Inc.

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KEYWORDS: peaches/fruit thinning/Texas.

Materials and Methods

In 1969, Fruitone CPA was applied to peach varieties Redskin, Ranger, and Redglobe at rates of 0, 150, and 300 parts per million (ppm). Trees were 4, 7, and 8 years old, respectively, and in good horticultural condition. Plots consisted of 5 trees each and were replicated 3 times, in a randomized completed block design. Just prior to treatment and before any natural fruit drop, approximately 100 fruits were harvested at random from each variety to obtain embryo length measurements. These measurements determined how close embryo length was to 7 to 10 millimeters (mm), which was considered optimum for application of the thinner. CPA was applied with a hand gun from a hydraulic sprayer having return flow jet agitation at about 100 pounds per square inch (psi) pressure. Trees were sprayed to runoff.

For evaluation of the treatments 150 fruits were initially identified and counted on three sectors of each tree. After treatment and after all fruit drop had occurred, the remaining fruit was counted. Then these fruits were hand thinned to a standard 6-inch spacing, and the number of fruits removed was recorded.

Treatments were repeated in 1970 on the same Redskin and Ranger plots. Selected Redglobe trees were treated for observational purposes only.

Results

When CPA was applied, embryo lengths for varieties Redskin, Redglobe, and Ranger were 8.0, 6.6, and 5.2 mm, respectively. Under some conditions Fruitone CPA effectively thinned peach fruit, but the results were highly variable. A concentration of 150 ppm did not remove adequate numbers of fruit (Table 1).

TABLE 1. AMOUNT OF PEACH FRUIT HAND THINNED FROM TREES TO ADJUST FRUIT LOAD AFTER NATURAL DROPS AND CHEMICAL THINNING WITH FRUITONE CPA

Variety	Fruitone CPA		
	0 ppm (control) Lbs fruit/tree	150 ppm Percentage of Control	300 ppm
	<u>1969</u>		
Redskin	13.0a ¹	64b	17c
Redglobe	10.8a	89ab	44b
Ranger	2.6 ²	46	0
	<u>1970</u>		
Redskin	18.8a	64a	43a
Ranger	20.2a	98a	43a

¹ All comparisons among treatments by variety not followed by the same letter are statistically different at the 5 percent level of probability.

² Nonreplicated.

In 1969, when the fruit crop was of moderate density, the 300 ppm concentration was satisfactory on Redskin trees, but in 1970 when the crop was heavy, thinning was inadequate. In 1969, this thinning treatment removed all fruit from Ranger trees, which were carrying a very light crop. In 1970, results were similar to those with Redskin. Redglobe variety was the most difficult to thin, the results being unsatisfactory. Some trees were adequately thinned, while some showed little effect of the thinner. Light to moderate leaf abscission occurred on trees of all varieties receiving the 300-ppm rate.

After hand thinning the fruit on all trees to the standard 6-inch spacing, the percent fruit remaining per counted region declined with increase in chemical thinning rate on all varieties except Redglobe. The results were not statistically significant in all cases (Table 2). Throughout individual tree canopy, this relationship probably can be attributed to nonuniform thinning by Fruitone CPA. Such heavier thinning at the higher chemical rate would not necessarily be undesirable, since experience and research often have shown inadequate fruit removal by hand thinning alone.

Discussion and Conclusions

Fruitone CPA can induce adequate fruit thinning; however, several factors such as varietal response, physiological stage of fruit development, concentration of thinner, weather

TABLE 2. PERCENTAGE OF FRUIT REMAINING AFTER ALL DROPS AND HAND THINNING (BASED ON 150 FRUIT SAMPLES)

Variety	Year	ppm		
		0	150	300
		Average number of fruit per tree ¹		
Redskin	1969	15.8a ¹	14.6a	7.9a
	1970	26.3a	21.7b	11.8a
Ranger	1969 ²	13.5	8.2	3.1
	1970	31.0a	23.5a	16.8a
Redglobe	1969	11.0a	10.7a	10.5a

¹ All means in the same row followed by the same letter are not statistically different at the 5-percent level of probability.

² Nonreplicated.

conditions, and physiological state of the tree apparently interact to affect the extent of fruit abscission (1). From observations during this study, variable physiological states of trees appeared to be the most serious cause of variability in tree to tree thinning. This variability is apparently associated with soil conditions and root problems that would not be practical to control. Since extent of fruit abscission is closely related to tree physiology, discovery of a satisfactory chemical thinner may be difficult.

References

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