PRUNE MATURITY ADVANCEMENT

with growth regulators

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OF THE 100,000 ACRES of prunes in California, approximately 95% are the French variety (*Prunus domestica*). This variety matures over a short period of time and must be harvested and dehydrated before quality and yield are reduced. This concentrated harvest season places an overload on harvesting and dehydrating equipment to process the fruit at optimum quality, especially in heavy crop years. One possibility for lengthening this harvest season is to advance fruit maturity in a portion of the orchard.

Maturity standards for French prunes involve both flesh firmness and soluble solids. Flesh firmness is used primarily, since soluble solids vary by district and season. The earliest that prunes may be harvested without seriously affecting yield and quality is at 5 lbs average flesh firmness, with 2 to 3 lbs being ideal. Fruit allowed to soften below 2 lbs firmness results in overripe fruit that is graded lower because of darker color and gas pockets in the flesh of the dried product.

Experiments were conducted in several prune districts in 1970, 1971, and 1972 to study the performance of the growth regulator Alar as related to spray concentration and timing needed to advance maturity. Five single tree replications were used per treatment in each experiment in a randomized complete block design. All treatments were by hand-gun application at 400 gallons per acre. Beginning at 15 lbs flesh firmness, random samples of 25 fruit were taken weekly from each replication to determine the effects of Alar on maturity. Fruits were evaluated for weight, flesh firmness and soluble solids.

Timing the application of growth regulators has been one of the most critical aspects of their use. However, these studies have shown that the timing of Alar applications does not appear to be a critical problem in prunes. The harvest date for the control was significantly later (at the 5% level) than all Alar timings, as shown in table 1. However, there was no significant difference between any of the Alar application dates.

TABLE 1. APPLICATION OF ALAR ON PRUNES AT VARIOUS DATES AT 4 LBS. PER ACRE

Application date	Application days before harvest	Harvest date*	Days advanced over control
4-14-70	114	8-6-70	8
5-15-70	84	8-7-70	7
5-26-70	74	8-8-70	6
6-16-70	53	8-8-70	6
7-7-70	29	8-5-70	9
7-28-70	11	8-8-70	6
Control	—	8-14-70	0

* Date when treatment reached 5# flesh firmness.

TABLE 2. DAYS PRUNE MATURITY ADVANCEMENT OVER CONTROL BY ALAR AT TWO RATES

Treatment	A	B	C	D
Alar 2 lbs/acre	2	3	6	9
Alar 4 lbs/acre	8	7	7	9

TABLE 3. EFFECT OF ALAR AT 4 LBS/ACRE ON DRIED PRUNE SIZE

		Screen size			
		30/32	26/32	24/32	24/32
Alar 4 lbs/acre	% fruit	31.3	54.5	10.9	3.3
	Dried ct/lb	57	70	90	117
Control	% fruit	34.4	47.6	12.4	5.6
	Dried ct/lb	56	68	90	127

The data shows that an application anytime between 30 and 100 days before harvest is acceptable. This flexibility in timing gives a grower the advantage of spraying between cultural operations. Also, he could determine the need for advanced maturity, as related to crop size, before the application must be made.

Consistent results have been obtained with Alar at 4 lbs per acre. Alar at 2 lbs per acre has been just as effective in half the experiments conducted, but this cannot be depended upon to give the desired maturity advancement in all situations (table 2).

Experiments with some additives such as oils or surfactants have not made Alar any more effective or consistent in those studies. Tests in 1972 have shown that fruit size and soluble solids are not affected by Alar treatments. Using the harvest criterion of 5 lbs flesh firmness, treated fruit was harvested five days earlier than untreated fruit without affecting size (table 3).

From these results, harvest can be advanced four to seven days by spraying Alar on part of an orchard. By harvesting the treated part of the orchard earlier, the remainder could then possibly be harvested before fruit firmness fell below 2 lbs. Harvest maturity standards for Alar sprayed prunes would be the same as for untreated fruit (beginning harvest at 5 lbs average flesh firmness). Another use for this material would be to treat earlier maturing blocks of the French variety so that they could be harvested and dried at the same time as earlier maturing varieties. This would allow more efficient harvester and dehydrator use early in the season.

Maturity advancement with Alar is a tool that the prune industry could use to improve quality and to manipulate harvest procedures, labor and equipment. Growers, however, will need to determine the maturity response that can be expected in their particular orchards. Finally, a grower would probably not want to use this material to advance maturity of more acreage than he could harvest in one week's time. Alar is not currently registered for use on prunes.

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