1996 FRENCH PRUNE FIELD SIZING

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INTRODUCTION

Large French Prune crops during the 1996 season caused concern that small undersized fruit would be delivered to driers. Undersized prunes have marginal value and may represent a net loss because of costs to haul, dry and market order payments on low value prunes.

Several methods are available to regulate cropping and encourage larger fruit size. Pruning, mechanical thinning, cultural practices and field sizing at harvest are some of the possibilities. Crop control during the season is the preferred method because the tree does not have to invest resources in producing prunes with little or no value. Field sizing at harvest is a last resort and by no means a substitute for in-season crop sizing techniques.

Field sizing at harvest is not a new idea (Sibbett, 1986) but is a relatively new practice for Tehama County Prune Growers. Heavy crops and equipment availability in 1996 provided an opportunity to evaluate the performance and economics of harvest field sizing.

PROCEDURE

During the 1996 harvest, nineteen infield harvest sizing evaluations were made in prune orchards throughout Tehama County. The first evaluation occurred on 8/14/96 at the beginning of prune harvest. The last evaluation was done on 9/7/96 at the tail end of prune harvest. The goal was to sample throughout the harvest period to test field sizing under various sugar, size and fruit pressure scenarios. The test machine was a Kilby 15/16 (.950 actual) bar sizer attached to a Kilby harvester.

At each evaluation, enough trees were harvested to place one bin of fruit in the pan. Prunes were then passed over the sizer and into the bin. As the bin filled, five gallon buckets were used to periodically sample fruit before and after the sizer. Average sample size involved about 20 pounds fresh weight before and after sizing (40 lbs. total; 3.3 percent sample size). Full bin weights were figured from load weights measured at the dryer and were fairly consistent at roughly 1200 pounds per bin. Cull or fruit dropped through the sizer was collected using a tarp beneath the screen. All cull fruit was collected and weighed so total percent cull could be calculated. The sampling procedure generated three groups of fruit: before sizing, after sizing and undersized cull.

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The three samples were immediately evaluated for fresh count per pound, flesh pressure and soluble solids. Soluble solids and pressure were measured by selecting a random 20-prune sample from each lot of fruit. The skin was removed from one side of the prune and the flesh pressure measured using a conventional pressure tester. Juice from each pressure tested prune was squeezed into a cup. The cumulative juice from all 20 prunes was tested for soluble solids using a hand held refractometer. Soluble solids and flesh pressure represent an average of the 20 sample prunes. Green count per pound was accomplished by counting the entire 20 pound sample.

Cull fruit was more challenging to evaluate because of shrivel, disease, soft fruit and generally, a more trashy sample. The procedure was the same for the before and after sample but the cull sample had to be picked through to collect sound prunes suitable for measurement.

Following fresh evaluation, each sample was randomly split into two 5 pound lots, placed in mesh dryer bags and delivered to Sunsweet. Bags were placed near the top of the tray stack and proceeded through the dryer.

Dry fruit was counted and weighed to determine dry away and dry count per pound. Samples were stored at room temperature for 30 days, then reweighed. Dry away and count per pound were adjusted to reflect equilibrium moisture content. Following the second weight check, the two lot samples were combined and delivered to the Dried Fruit Association (DFA) for grade and size evaluation.

RESULTS AND DISCUSSION

Harvest sizing using a 15/16 opening decreased dry count per pound on eleven of the nineteen samples (Table 1). Dry count per pound was unaffected on eight sample dates.

There may be several reasons why differences were not more consistent. For the most part, the percentage of undersized prunes was relatively small. With the exception of an 11.5 percent undersize on 9/4, percent undersize ranged from 0.72 to 4.8 percent. There may not have been enough undersize fruit to have a major impact on the after size sample, particularly late in the season when soluble solids are high and the dry weight of small prunes is higher.

Also, for the first week in September, soluble solids for the cull fruit were 23.0 to 25.0 (Table 2). A significant factor since these prunes will have a heavier dry weight which would improve the dry count for the before sample making it more comparable to the after sample. Secondly, 15/16 is probably a conservative field sizer, so it may be reasonable not to see large differences.

Table 2 shows the fruit characteristics and 1996/1997 calculated market value for prunes removed by the 15/16 sizer. Undersized prunes had little or no market value until the end of the season when soluble solids were high. The risk of removing marketable fruit is greater later in the season as soluble solids increase. The difference in value of undersized prunes for 1996 and 1997 clearly

shows that as the price per ton for small prunes declines, the chance of removing marketable prunes also declines.

CONCLUSIONS

In this evaluation, a 15/16 bar type harvest sizer did a fairly good job of separating fruit with and without market value. As harvest date becomes later and soluble solids increase, the chances of sorting out marketable prunes also increases. Growers need to monitor fruit characteristics and monitor performance of harvest sizing equipment.

The decision to harvest size has to consider the sizing potential of the orchard, crop load, harvest crop size and soluble solids. Growers who use this equipment need to monitor sorted fruit particularly if larger sizer openings are selected.

ACKNOWLEDGMENTS

The authors very much appreciate the Dried Fruit Association (DFA) for donating their facilities to grade dry samples. Their participation made this project possible.

1996 Harvest Samples and Fruit Characteristics

Sample Date	Pressure	SS	Green Ct	% Cull	Dry Ratio	Dry Ct/lb. Before	After	Effect[1]
8/14	5.7	20.0	24	2.00	3.70	93	95	N
8/15	5.0	20.0	26	0.95	3.96	104	101	+
8/16	2.1	23.8	32	2.30	3.10	104	101	+
8/20	4.2	19.0	24	2.20	3.86	93	92	+
8/21	3.7	22.5	18	0.72	3.42	62	64	N
8/22	4.4	21.0	20	3.10	3.39	65	62	+
8/22	4.7	19.2	22	2.20	3.47	76	77	N
8/23	3.8	17.8	27	1.90	3.07	99	96	+
8/26	3.2	21.6	23	1.90	3.77	87	78	+
8/27	3.8	19.8	22	1.30	3.30	75	69	+
8/28	3.7	21.5	21	0.99	3.34	73	71	+
8/29	3.5	20.0	22	4.70	3.42	74	73	+
8/31	2.7	18.0	18	1.60	3.38	64	60	+
9/2	1.8	24.8	24	3.00	2.67	64	64	N
9/3	3.1	15.0	23	4.80	4.10	96	93	+
9/4	2.5	25.2	28	11.50	2.90	82	82	N
9/5	1.9	24.8	25	4.70	2.75	71	73	N
9/6	2.4	22.0	19	1.50	3.03	61	65	N
9/7	2.3	23.8	24	3.80	2.87	75	76	N

[1]N = no effect or change in dry count per pound
+ = positive effect on dry count per pound

Table 1:
Incoming fruit characteristics and dry count per pound before and after field sizing using 15/16 inch opening.

1996 Cull Fruit Characteristics and Economic Value

Date	Pressure	SS	Dry Ratio	Green Ct	Dry Ct	1996[1] Value/ton	1997 Value/ton
8/14	2.6	16.0	4.29	46	198	—	—
8/15	3.9	16.0	4.48	50	216	-168	-197
8/16	1.3	—	3.29	45	166	-109	-142
8/20	3.0	14.2	4.29	39	191	-157	-188
8/21	3.4	22.2	3.50	42	151	-69	-128
8/22	2.9	19.0	3.58	42	150	-70	-145
8/22	2.3	15.5	4.03	44	177	-43	-101
8/23	3.0	16.5	2.96	48	145	-10	-117
8/26	2.3	13.0	4.42	42	190	-131	-183
8/27	2.9	17.6	3.17	40	130	+92	-97
8/28	3.1	14.6	3.75	37	148	+6	-104
8/29	2.6	13.8	4.18	40	164	-100	-174
8/31	2.6	13.0	4.08	46	188	-88	-148
9/2	1.2	—	3.01	39	119	+255	+116
9/3	2.9	11.0	4.90	39	199	-191	-219
9/4	2.1	25.0	3.17	38	116	+133	-62
9/5	2.3	25.0	2.78	35	96	+404	+186
9/6	1.7	23.0	3.02	34	108	+340	+200
9/7	1.5	—	2.86	39	114	+228	+23

[1]Based upon 1996 and 1997 price schedules dry value or loss per ton.

Table 2:
Fruit characteristics and dry ton value from cull fruit removed using a 15/16 sizer opening.