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Yield and Fruit Size in High Density Peach Hedgerows

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Abstract

'McNeely,' 'Sunqueen,' and 'Washington' peach trees set at 7,683 trees/ha yielded an average of 22.5 MT/ha the second summer in the orchard (1982). 'Washington' yielded more than the other cultivars. Fruit weight averaged acceptable marketable size for all cultivars. Third leaf trees (1983) topped at 1.5 m after the 1982 harvest yielded 51.3 MT/ha, whereas trees topped at 0.9 m after the 1982 harvest had reduced yield. Fruit size was reduced in the 1983 harvest.

Materials and Methods

Summer pruning and high tree density were studied at the Pontotoc Ridge-Flatwoods Branch Experiment Station in north Mississippi to determine yield potential of 'McNeely,' 'Sunqueen,' and 'Washington' peaches. Cuttings were rooted in August 1980 and planted in April 1981 at 0.31 m x 4.25 m (7683 trees/ha). A completely randomized design was used in the orchard with 10 replications of 5 trees per experimental unit. Trees were pruned following the 1982 harvest at either 0.9 m or 1.5 m in height and 0.9 m in width, resulting in low hedgerows of different heights. Recommended cultural practices were followed for pest control.

Harvests from 1982 and 1983 were made 15 and 27 months, respectively, from the time of orchard establishment. Fruit was harvested when judged firm ripe for commercial harvest. Total yields and individual fruit weights were recorded. Data were analyzed as a 3 x 2 factorial with 3 cultivars and 2 pruning heights.

Results and Discussion

Cultivar differences were evident in 1982 when the orchard averaged 22.5 MT/ha (Table 1). 'Washington' was superior to 'McNeely' and 'Sunqueen.' Average fruit size of the 3 cultivars was adequate for commercial markets (2-inch dia. up—standard equals about 80 g, data not shown). Trees were pruned in July immediately following harvest. In 1983 only pruning height resulted in significant yield differences. Yield from trees pruned to 0.9 m height was 6.2 MT/ha and from trees pruned to 1.5 m was 51.3 MT/ha. (Table 2). Fruit size was smaller in 1983 across all cultivars and pruning heights. Average fruit size of 'Washington' and 'Sunqueen' at both hedge heights was inadequate for commercial markets.

A standard orchard (244 trees/ha) near the same site, consisting of mixed cultivars with trees ranging from 3 to 9 years of age, averaged 52% of the yield of the high density orchard in 1982. The reduced yield from the 0.9 m hedge in 1983 was 64% of these standard orchard trees. But the increased yield from the 1.5 m hedge was more than 5 times greater than the yield from the standard orchard.

Data from incompletely replicated plots of other cultivars showed cultivar variability in yield under high density, summer pruning conditions (data not shown). 'Harbrite' had the highest yield in this test. 'Flordagold' in Florida has been shown to have

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Table 1. Yield and fruit size of 3 peach cultivars in the second leaf at 7,683 trees/ha (1982).

Cultivar	Yield[z] (MT/ha)	Average Fruit Weight (g)
Washington	30.0 a	108
McNeely	19.3 b	119
Sunqueen	18.1 b	98
Mean	22.5	

[z]Mean separation by Duncan's Multiple Range Test, 1% level.

higher yields of marketable fruit in high tree density plantings than other clonal selections and cultivars (7).

High density peach hedgerows resulted in high yields early in the orchard life, as described in other high density systems (1, 2, 3, 5, 6, 7). Other advantages of the system are: potential of mechanizing most of the activities of the orchard; efficient use of spray materials (4), fertilizers, and water (6); and close proximity of all fruit to the ground for picking convenience. These data reveal that pruning severity must be considered to avoid yield reductions.

Table 2. The effect of topping height on yield and fruit size of 3 peach cultivars in their third leaf at 7,683 trees/ha (1983).

Topping height	Cultivar	Yield (MT/ha)	Average Fruit Weight (g)
0.9 m	Washington	13.1	77
	McNeely	3.0	86
	Sunqueen	2.4	60
	Mean	6.2[z]	
1.5 m	Washington	47.6	73
	McNeely	54.8	89
	Sunqueen	51.6	69
	Mean	51.3[z]	

[z]Topping height means significant at 1% level.

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