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CLOSE PLANTING OF AVOCADO

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Abstract

This work is the continuation of the paper presented at the World Avocado Congress II in California (1992) which reported results of the six initial years of a trial where three planting distances (6x6, 5.5x3 and 4x2 m) are being compared in an experimental grove of the cv. Bacon. During the seventh and eighth years trees continued to grow inversely proportional to planting density, the grove becoming somewhat crowded at 4x2 m. Conversely; at 6x6 m there was plenty of space between trees. At 5.5x3 m trees formed an equilibrated hedge. Yield per tree continued to increase at the three densities up to the seventh year. At the eighth year it strongly decreased at 4x2 m while it remained almost stationary at the other two densities. Yield taken on a per hectare basis continued to be quite proportional to planting density and reached the highest level at 4x2 m the seventh year (near 44 metric Ton/Ha.). Despite the reduction in tree production the eighth year at this planting distance, yield per hectare was still a little higher than at 5.5x3 m. At 6x6 m yield was much lower than at 5.50. Individual fruit weight and maturity were not affected by planting distance.

1. Introduction

This work is the continuation of the paper presented at the World Avocado Congress II in California (Razeto et al., 1992) on the effect of close planting of avocado trees (cv. Bacon) after the six initial years of the trial. In that opportunity it was reported that when comparing three planting distances (6x6, 5.50 and 4x2 m) the trees started to form dense hedges five and six years after planting at the latter two spacings, respectively. From the fourth year on, yield per tree started to be proportionally lower at closer spacings. However, yield taken on a per hectare basis continued to increase in accordance with planting density up to the sixth year, becoming extremely high particularly with the highest density planting.

The current paper reports the results obtained in the two years that followed (7th and 8th) concerning tree growth, fruit production and fruit size.

2. Material and Methods

"Bacon" trees grafted on Mexicola rootstock were planted in the Spring of 1984 on a uniform and deep clay loam soil, located 50 km West of Santiago. Blocks of three rows were planted for each distance to be tried. Eight, 15 and 22 trees per row were respectively planted at

each distance, respectively. Planting distances being tried are 6x6, 5.50 and 4x2 meters. One row of "Hass" trees was planted between blocks as a pollinator, leaving a 6 m space between blocks (Figure 1).

Trees were grown without any pruning or thinning. Periodical furrow irrigation was done during spring, summer and fall. Yield per tree was weighed yearly. Fruit size and oil content were determined yearly starting with the 1990 harvest, taking a random sample of six fruits per tree. Trunk diameter was measured in March 1990, 1991 and 1992.

All measurements and samplings were done in six trees per treatment, located in the central row of each block.

3. Results and Discussion

During the seventh and eighth years in the 4x2 and 5.5x3 m spacings the trees continued to grow both in height and towards the space between rows since they had already formed a dense hedge on the rows. In the 4x2 spacing some branches of adjacent rows were almost touching each other. Conversely, at 6x6 m, although the trees grew in all directions, there still existed a wide space among them. At the 5.5x3 arrangement the hedge was fairly balanced.

The trunk diameter kept increasing inversely proportional to the plantation density resulting in greater differences among treatments relative to the sixth year (Table 1).

Yield. In the seventh year, the individual production per tree continued to increase in the three planting densities. In the eighth year it increased slightly in 5.5x3 m. decreased somewhat in 6x6 m, and decreased significantly in the 4x2 m spacing (Figure 2). The abrupt production drop resulting from this higher plantation density would probably be due to the debilitation of trees and/or the excessive shading which they already presented.

Production in tons per hectare in the 4x2 m spacing continued to increase in the seventh year reaching the record of 43.7 ton/ha but dropping in the eighth year. Despite this drop, production was still higher than at the 5.5x3 and 6x6 m spacings where it remained quite stable and proportional to planting density from the seventh year on (Figure 3).

Fruit weight and maturity. As shown in Table 2. both in the seventh and eighth years the average individual weight of fruits showed no significant differences according to the planting spacings.

The weight reached by fruit is the normal for the cultivar. With respect to maturity, an adequate oil level (about 12%) was achieved in October of the seventh and eighth years at all densities.

From the results obtained in this investigation it is concluded that avocado trees planted at much closer spacing than the traditional one in order to form a hedgerow is a promising system for the Bacon cultivar and probably for others of similar growth habit and production (erect tree with moderate vigor and precocious production) particularly when the goal is to achieve a rapid production even at the expense of a Possible shorter life of the grove.

4. References

Razeto, B.; J. Longueira and T. Fichet. 1992. Close planting of avocado. Proc. of Second World Avocado Congress. California. pp. 273-279.

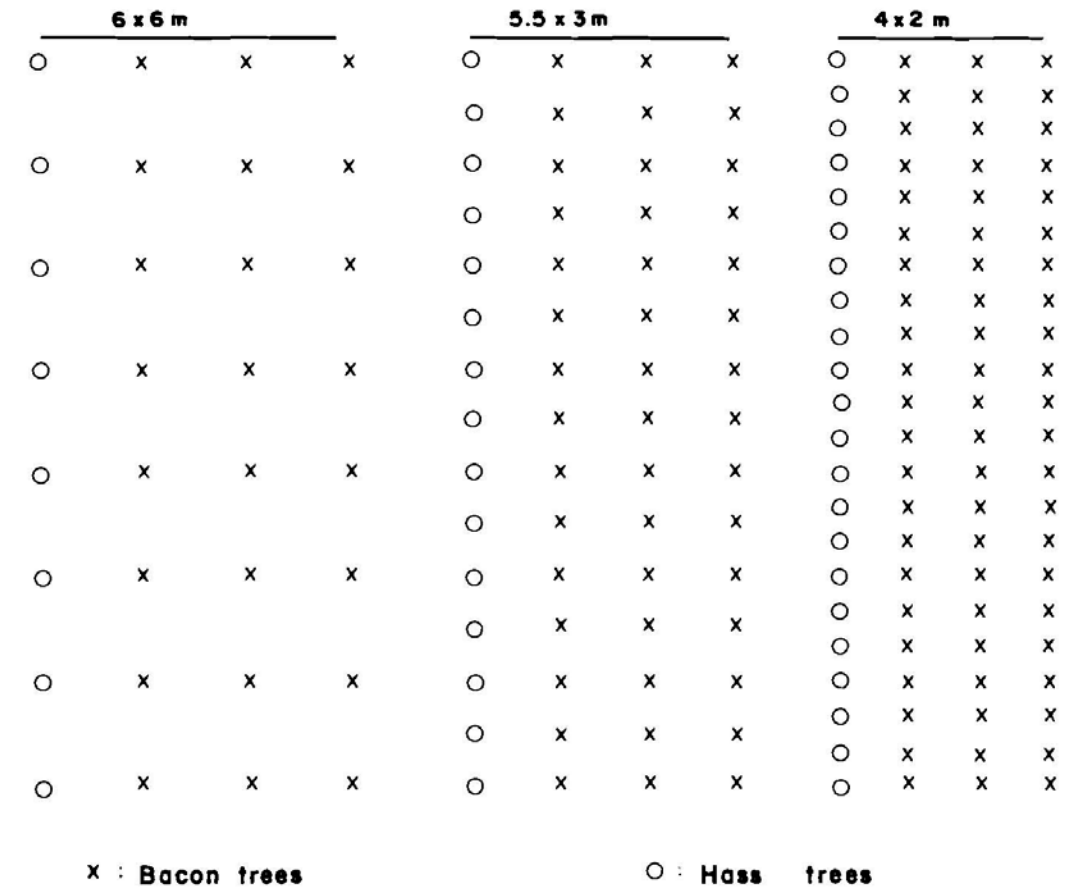

Fig. 1 ; Layout of the experimental grove

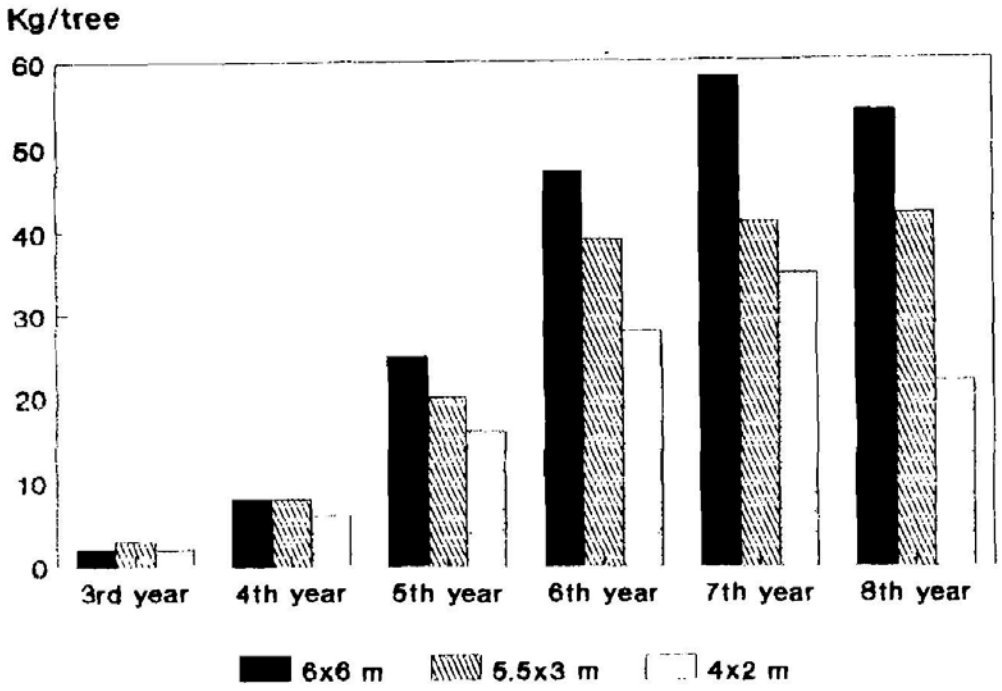

Fig. 2. Effect of planting distance on yield per tree.

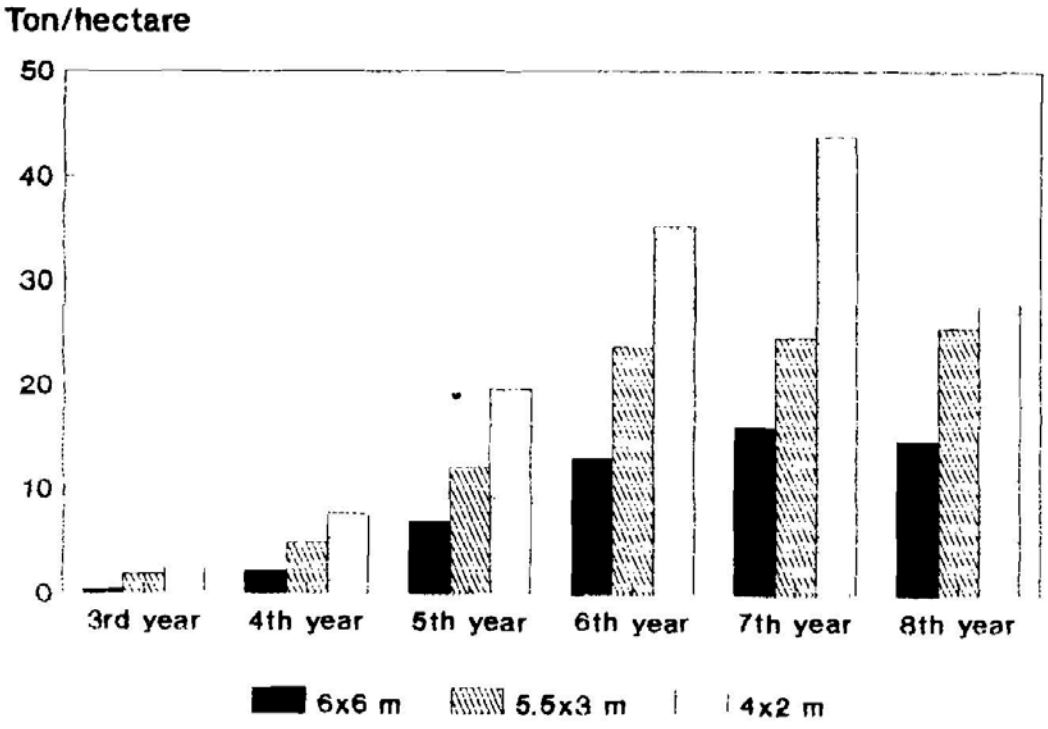

Fig. 3. Effect of planting distance on yield per hectare.

Table 1. Effect of planting distance on trunk diameter, cm.

Planting Distance	Sixth year(1)	Seventh year(1)	Eighth year(1)
6 x 6 m	14.89 a	17.34 a	20.78 a
5.5 x 3 m	13.43 ab	15.56 ab	18.43 a
4 x 2 m	12.24 b	13.51 b	15.40 b

(1) Values in a column followed by the same letter do not differ significantly at $P \leq 0.05$.

Table 2. Effect of planting distance on fruit weight.

Planting Distance (m)	Fruit weight (g)	
	Seventh year(1)	Eighth year(1)
6 x 6	215.1 a	263.3 a
5.5 x 3	210.5 a	257.6 a
4 x 2	195.1 a	253.4 a

(1) Values in a column followed by the same letter do not differ significantly at $P \leq 0.05$.