

Effect of cv Colin V-33 as interstock on avocado (*Persea americana* Mill) growth, cv Fuerte

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SYNOPSIS

Colin V-33 (a dwarf avocado) used as interstock in pieces ranging from 10-30 cm and from 30-50 cm in length were used to evaluate their effect on the growth of 11-year-old Fuerte scions. The rootstocks of the combinations were Mexican type seedlings. The results indicate that the piece of the interstock ranging from 10-30 cm reduced the height of the scion by 38,8 per cent while the piece of 30-50 cm reduced it by 47.33 per cent Fuerte scions without interstock showed an average height of 5.98 m as compared to 3,66 and 3,15 m of the trees with shorter and longer interstocks respectively. A reduction in canopy diameter, circumference of scion and main branches and the distance to the point where the main branches commenced, were also found. No differences were noticed in canopy thickness and in circumference of the rootstock. These findings indicate the potential use of Colin V-33 as a dwarfing interstock for avocado.

INTRODUCTION

The avocado trees of commercial orchards reach a big size because they grow on seedling rootstocks. One of the research objectives for this crop is to reduce the size of the trees. This could allow an increase in planting density, a better pest and disease control, and easier harvesting. One form of reducing the size of trees could be by using dwarfing rootstocks and another through the use of interstocks. In avocado, little has been done on selection of dwarfing interstocks; Bergh (1975) reports that in Israel the research with interstocks of Wurtz has shown no dwarfing effect on scions, In Mexico, Hernandez & Gallegos (1982) report that the selection Cuerno Morado as interstock reduced the growth of Hass.

Because of the importance of small avocado trees, the objective of this research is to evaluate the effect of Colin V-33, a dwarf tree (Sanchez, 1980), as an interstock.

MATERIALS AND METHODS

Eleven-year-old Fuerte trees were used with interstocks of Colin V-33 ranging from 10-30 cm and 30-50 cm in length (Figures 1, 2 and 3). Trees without interstocks (Figure 4) were also evaluated. All of these trees were on Mexican race seedling rootstocks and were located at Coatepec Harinas, State of Mexico.

The variables studied were circumference of rootstock and scion, canopy thickness, circumference of main branches, canopy diameter, scion height, and the distance to the point where main branching began. Statistical analyses were performed using an F-test procedure. A tree was used as an experimental unit with eight replications in a completely randomised design.



Fig 1 & 2 Avocado interstocks of Colin V-33.



Fig 3 An 11-year-old Fuerte avocado tree with Colin V-33 as interstock.

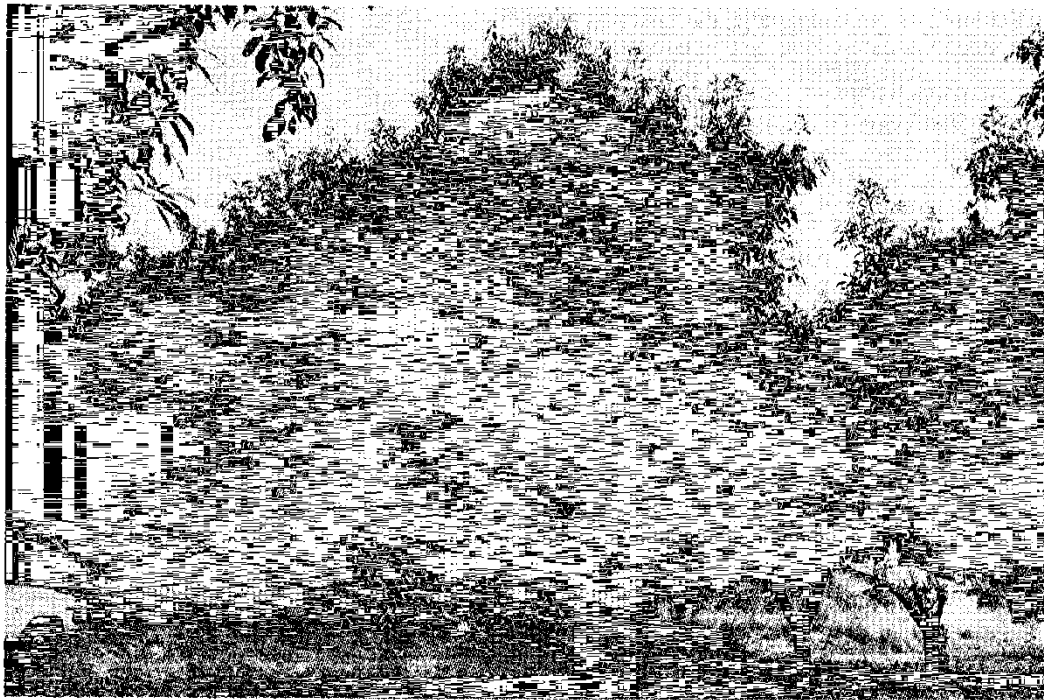


Fig 4 An 11-year-old Fuerte avocado without interstock.

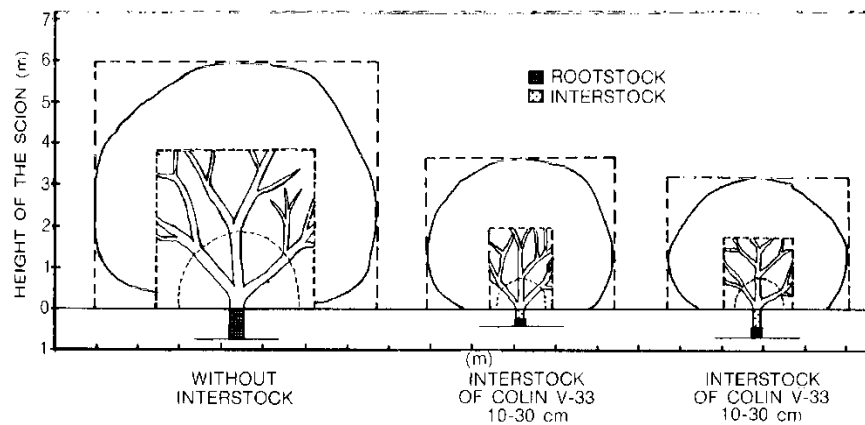


Fig 5 Size of Fuerte scions of trees with and without Colin V-33 interstocks.

RESULTS

The results indicate that the interstock piece ranging from 10-30 cm reduced the height of the scion by 38,8 per cent while the interstock piece of 30-50 cm reduced it by 47,33 per cent. Trees without interstock showed an average height of 5,98 m as compared to 3,66 and 3,15 m of the trees with shorter and longer interstocks respectively, A reduction in canopy diameter, circumference of scion and main branches and the

distance to the point where main branching commenced, were also found (Figure 5). All of these characteristics were significantly different but no differences were found in canopy thickness and in rootstock circumference (Tables 1 and 2).

No differences were found in the effect of interstock length and no significant correlation between the length of the interstock and the height of the scion ($r = -0,27$).

	Rootstock circumference (cm)	Scion circumference (cm)	Main branch circumference (cm)	Length of main branches to its branching (m)
Without interstock	91.37 a ¹	99.87 a	55.14 a	1.35 a
Interstock 10-30 cm	78.87 a	62.12 b	40.29 a	0.58 b
Interstock 30-50 cm	73.87 a	66.75 b	40.24 a	0.57 b
Significance of F test	NS	**	*	**
Coefficient of variability	16.86%	22.20%	22.86%	40.04%
	Canopy lateral thickness (m)	Canopy top thickness (m)	Canopy diameter (m)	Scion height (m)
Without interstock	1.50 ¹	2.16 a	6.73 a	5.98 a
Interstock 10-30 cm	1.42 a	1.71 a	4.48 b	3.66 b
Interstock 30-50 cm	1.38 a	1.47 a	4.35 b	3.15 b
Significance of F-test	NS	NS	**	**
Coefficient of variability	22.27%	30.24%	19.31%	14.01%
¹ Values of the same letter are equal according to the Tukey test at 1 per cent NS Not Significant. * Significant at 5 per cent and ** Significant a 1 per cent				

DISCUSSION

According to the results obtained it seems clear that the interstock of Colin V-33 has a dwarfing effect on Fuerte scions. The dwarfing mechanism has been discussed by Lockard & Scheider (1981). They propose that the supply of auxin to the roots is reduced by the presence of IAA-oxidase, peroxidase and phenolic compounds that are present in the bark tissue of dwarfing interstocks. This bark is thick and has high levels of starch with low levels of auxin. As a consequence of this reduction of auxin supply,

there is a reduction in the production of cytokinins by the roots that alter the normal growth pattern of the tree.

Lopez & Barrientos (1987) found that six-year-old Colin V-33 seedling avocado trees with dwarf habit (7 1,55 m of height) have more bark area (22,7 per cent) than tall trees (7 = 5,75 cm of height) which has a 12,9 per cent bark area. Sixteen-year-old Colin V-33 trees have thicker bark (1,09 cm) than their seedling rootstock (0,60 cm) of Mexican race (Barrientos & Lopez, unpublished data).

This difference in bark thickness of Colin V-33 could be related to that proposed by Lockard & Scheider (1981) in relation to dwarfing mechanism of the interstock.

In relation to the length of interstocks, although no significant differences were found in the size of the tree, there was a trend to reduce the size of the tree as the interstock length increased.

These findings indicate the potential use of Colin V-33 as a dwarfing interstock for avocado.

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