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## **Decline of Citrus on Sweet Lime Rootstock in the Bella Vista Region of Argentina**

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APPROXIMATELY 3 million citrus trees are cultivated in the Bella Vista area, which produces 30 per cent of Argentina's sweet orange crop. About 60 per cent of the trees are on sweet lime [*Citrus aurantifolia* (Christm.) Swing.] rootstock which came into general use following the epidemic of tristeza. However, the condition of many orchards is unsatisfactory, and large numbers of trees are declining. A survey of orchard trees was undertaken to investigate this condition.

Since 1961, 10 per cent of 81,900 orchard trees in the Bella Vista region have been carefully examined (Table 1). Pieces of bark for examination were cut from the branches, trunk, and rootstock of each tree.

TABLE 1. SWEET ORANGE VARIETIES ON SWEET LIME ROOTSTOCK IN THE BELLA VISTA REGION, SHOWING VIRUS SYMPTOMS AND DECLINE

Varieties grafted	Plantation locations				Total	Symptoms
	Lomas	C. 3 de abril	C. Progreso	I. Alta		
Criolla	28,200	6,500	18,000	2,000	54,700	100 per cent stem pitting
Valencia late	9,600	600			10,200	100 per cent stem pitting
Pera	5,300	3,600	4,000	500	13,400	{ 20 per cent xyloporosis and 80 per cent stem pitting 100 per cent xyloporosis
Lue Gim Gong			2,400	1,200	3,500	
					<u>81,800</u>	

The degree of decline varies with different varieties and with the age of the tree, but Pera and Lue Gim Gong varieties of sweet orange [*C. sinensis* (L.) Osb.] and Duncan grapefruit (*C. paradisi* Macf.) appear to be the most severely affected. Of all trees examined, 92 per cent exhibited stem pitting (Fig. 1) on the sweet lime rootstock, but 100 per cent of the Valencia late and Criolla (common) sweet orange showed this symptom. These are the four varieties most widely grown in this area.

Until they are ten years old, trees exhibiting stem pitting grow fairly well on sweet lime rootstock and bear normal size fruit, but they show a moderate degree of dieback. After 10 years of age, affected trees decline and after 15 years production becomes very low.

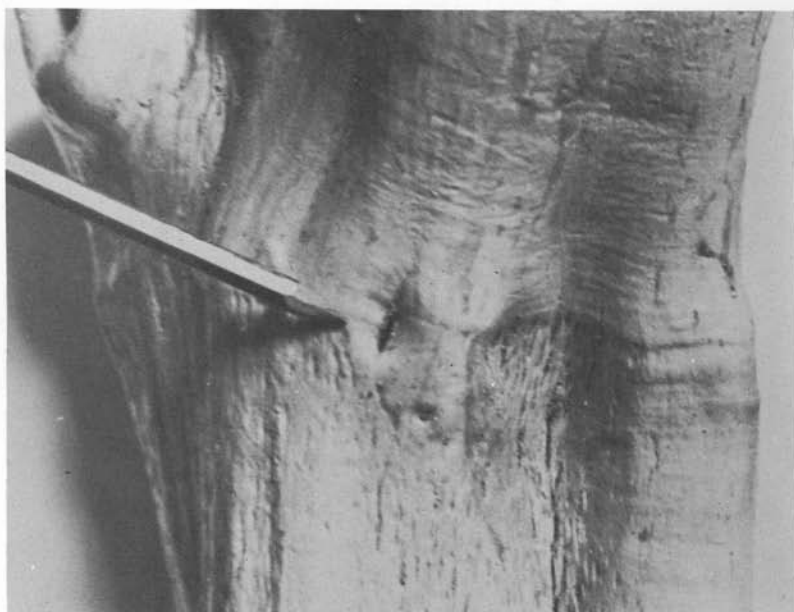


FIGURE 1. Stem pitting at the bud-union of a tree on sweet lime rootstock.

Xyloporosis was found on all Lue Gim Gong trees and on 20 per cent of Pera trees on sweet lime rootstock. These trees decline from an early age and bear small, deformed fruits.

Many trees show an overgrowth of the top variety at the bud-union, and when the bark is removed from such trees, three or four pegs of strong yellow color are found that projected into the bark (Fig. 2). At

the same time, the wood of the rootstock shows typical xyloporosis symptoms such as ovoid cavities and gummy pegs of brown color.



FIGURE 2. *Trunk with xyloporosis symptoms on sweet lime rootstock.*

### *Conclusions*

The orange varieties on sweet lime rootstock that decline after ten years of age are affected by tristeza virus, whereas those that decline from an early age are affected by xyloporosis virus. There are numerous reports that trees on sweet lime rootstock may decline from tristeza infection, and we believe that is the case here. Under these conditions, and since this is a "tristeza zone," the use of sweet lime rootstock is not recommended in this region.

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