Bark Suberification of Citrus Trees: Evidence of the Genetic Nature of the Trouble

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Abnormalities of unexplained origin were observed on the bark of the trunk and branches, on the peel of the fruits, and on leaves.

SYMPTOMATOLOGY

Affected trees usually attract attention because of their subnormal development. The bark of the scion trunks and branches is corky, with brown or gray elevated excrescences but from the bud union downward the Ranpur lime rootstock remains unaffected (fig. 1C).

These elevated excrescences are small spots or elongated roughened stripes covering part or almost all the surface of the trunk. The leaves and fruits (figs. 1 and 2) from affected trees have scar-like spots resembling star melanose or injuries caused by copper sprays (Klotz, 1973). The excrescences are superficial and involve only the external part of the affected tissues; the wood of the trunk and the albedo of fruits appear normal. Similar symptoms have been described as "bark suberification" by Chapot (1964).

A tree of a nucellar clone of Baia Monte Parnazo, a navel sweet orange in the collection of the Limeira Experiment Station and a group of 4-year-old trees of a late variety, Natal sweet orange, in the Barretos area showed this disorder. The navel clone had the most conspicuous symptoms.

TRANSMISSION TESTS AND CYTOLOGICAL STUDIES

Attempts to transmit the disease were made by grafting pieces of the bark and buds from affected trees into branches of normal nucellar-clone trees. Two kinds of shoots developed above the bud grafts, normal shoots originating from buds of the healthy trees and abnormal shoots from grafted buds in which the trouble was perpetuated (fig. 2). New sprouts from pruned branches of affected trees reproduced the symptoms of bark suberification.

Shoots originating from buds of healthy trees but grafted onto abnormal ones were normal, indicating that the disorder did not influence them.

Cytological studies on normal and affected leaves of Monte Parnazo navel sweet orange revealed no chromosomal differences indicating that they probably have the same level of ploidy.

CONCLUSION

These studies and observations lead us to conclude that this disorder is probably a genetic mutation perpetuated by grafted buds. The affected trees should be replaced because of their small size and low production of poor quality fruits.

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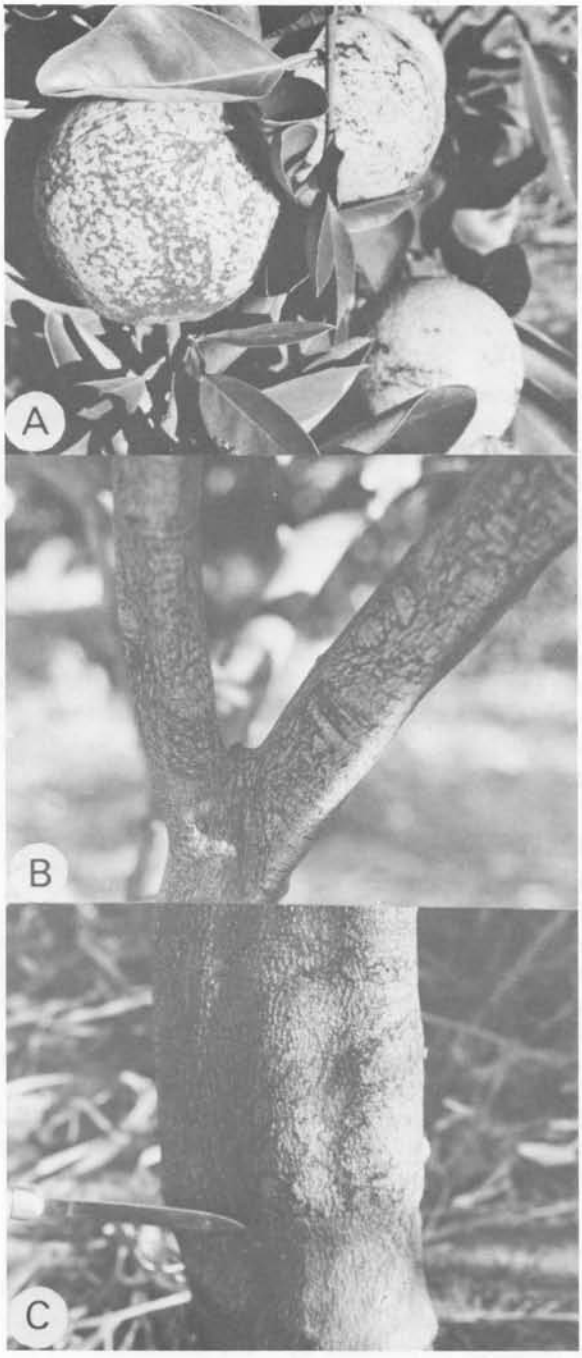

Fig. 1. Bark suberification of Natal sweet orange. A, roughness on the peel of fruits. B, roughness of the bark of branches. C, roughness of the trunk above the bud union.

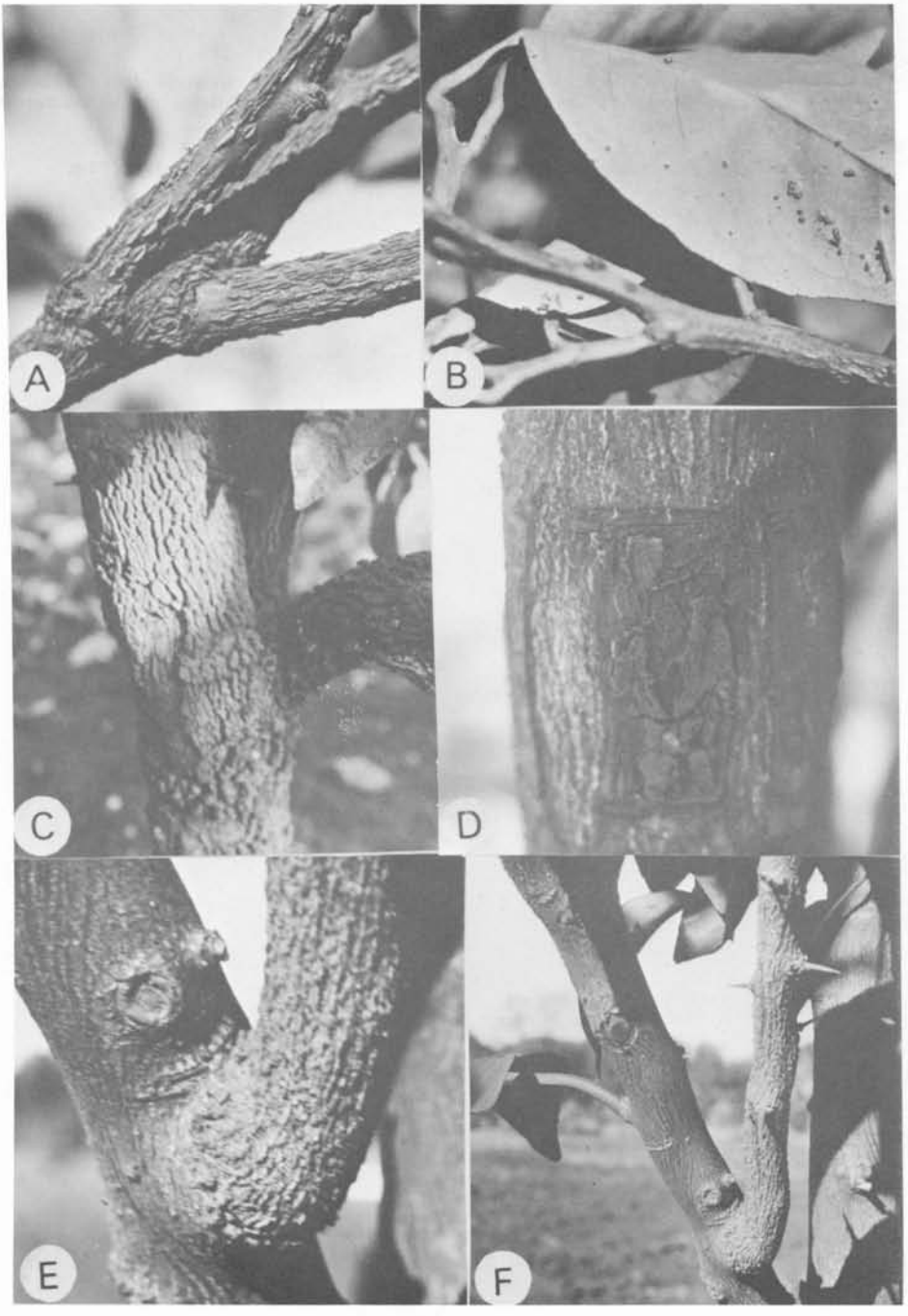

Fig. 2. Bark suberification on Monte Parnazo navel sweet orange. A and B, excrescences on small branches and leaves. C, severe roughening of the bark of the trunk above the bud union. D, bark from affected trees budded on normal trees did not transmit the disorder. E and F, shoots grown from buds of affected trees developed the disorder.

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