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# The Occurrence of Greening Disease in Pakistan

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The occurrence of greening was recently reported in Pakistan. The purpose of this paper is to record its occurrence in the western part of Pakistan near the Afghanistan border and its threat to the important citrus areas of the Middle East and Mediterranean. Citriculture in northwest Pakistan is limited to a few warm areas in the lower foothills such as in the Rio Chinar and Swat valleys. Orange, mandarin and grapefruit trees do well in these areas and develop excellent fruit quality.

In the course of looking at deciduous fruits in these areas various citrus plantings were examined. It was a disappointing surprise to find much of the citrus variety collection of the experiment station at Peshawar showing greening. Since part of the fruit program is to propagate trees for distribution to farmers, the growing nursery stock was examined and many nursery trees were found infected. This was not surprising since buds were taken directly from the experiment station orchard. The greening vector, *Diaphorina citri*, was abundant in the variety orchard, in the nursery, and on ornamental sour orange hedges, which also showed typical symptoms for sour orange (Gon-

zales *et al.*, 1972).

The fact that some of the older citrus orchards both in the Rio Chinar and Swat valleys, the nursery stocks for which were reported to have been propagated at Peshawar, were healthy whereas younger ones were diseased indicates that greening in the experiment station plantings at Peshawar may be of recent origin. The older orchards may have been planted with stock propagated prior to introduction of greening. Greening was undoubtedly introduced in citrus brought to Peshawar from other parts of Pakistan or perhaps from India where the disease is well established.

Fruit is exported from Pakistan to Iran and current quarantines may not be sufficiently effective to prevent movement of nursery stock across national borders. The hot climate of the Khuzestan would probably not support the vector *Diaphorina citri*, (Catling, 1970), but other areas of Iran suitable to citrus culture could support it. If greening should become established in Iran, there is a more or less continuous citrus planting in Iraq and Jordan for a bridge to the Mediterranean.

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