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## International Organization of Citrus Virologists Conference Proceedings (1957-2010)

### Title

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### Permalink

<https://escholarship.org/uc/item/4xr9m2mj>

### Journal

International Organization of Citrus Virologists Conference Proceedings (1957-2010), 12(12)

### ISSN

2313-5123

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### Publication Date

1993

### DOI

10.5070/C54xr9m2mj

Peer reviewed

# Mandarin Production in the Sub-Himalayan Tracts of India, Nepal and Bhutan, and the Prevalance of Citrus Greening Disease

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**ABSTRACT.** Nepal, Bhutan and the northeastern states of India grow excellent quality mandarins, but the agricultural practices are traditional and management is poor. Citrus greening disease and *Phytophthora* rot are common. Indexing for greening disease shows that the extent of spread has attained alarming proportions in parts of Meghalaya, Sikkim and Nagaland states in India. Visual observations in the Pokhara valley in western Nepal and the Tatapani district of southern Bhutan indicate a similar picture.

The two Himalayan countries of Nepal and Bhutan and the northeastern region of India covering Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, Sikkim and the Darjeeling district of West Bengal grow excellent quality mandarins. According to rough estimates, about 37,000 hectares are cultivated with an annual production of 240,000 tonnes of fruit (1, 2, 3). The characteristic features of the citrus industry of these regions include; i) small mandarin gardens with seedling trees, ii) cultivation with limited labor and material, iii) poor orchard hygiene creating favourable conditions for diseases and pests (greening and *Phytophthora* are common), iv) citrus decline attributed mainly to neglect, and v) production even at the present low level is profitable with a growing market.

Greening disease has been reported from the entire region, and from the results of limited indexing (6) in the northeastern region of India, it can be seen that the spread of the disease has attained alarming proportions (Table 1). The high incidence in the West Garo Hills of Meghalaya is attributable to higher temperatures there, compared to the negligible spread in the higher, cooler Khasi Hills.

Visual observations of greening disease in the Pokhara valley of West Nepal and the Tatapani district of southern Bhutan which are high rainfall areas, show that the disease is also widespread, while incidence is low in the low rainfall district of Dhankuta in eastern Nepal.

TABLE 1  
GREENING INCIDENCE IN MANDARINS  
IN NORTHEASTERN INDIA<sup>z</sup>

State District	No. +/ No. tested
Meghalaya	
Northern slope of Khasi Hills	0/26
Southern slope of Khasi Hills	2/38
Central Plateau	0/5
Central Jaintia Hills	0/16
West Garo Hills	20/60
Tripura	
Jampui Hills	3/20
Sikkim	
East district	18/36
South district	3/8
Nagaland	
Longnok	4/10
Mokochung	7/14
West Bengal	
Darjeeling	19/64
Arunachal Pradesh	
Basar-Along	3/24

<sup>z</sup>Sources (4, 5).

## LITERATURE CITED

1. Anonymous  
1984. Crop survey report of Bhutan, Dept. Agriculture, Thimpu, Bhutan, 15 pp.
2. Anonymous  
1987. A brief introduction of National Citrus Development Programme. Dept. Agriculture, MOA, NCDP, Paripatle Dhankuta, Nepal, 4 pp.

3. Anonymous  
1990. Basic statistics of North Eastern Region. North Eastern Council, Shillong, India. 191 pp.
4. Ghosh, S. P., A. N. Verma, S. Govind, R. P. Medhi, R. N. Prasad Patiram, R. C. Barooah, J. N. Sachan and S. K. Gangowar  
1982. Mandarin orange decline in North Eastern Hills Region and its control. Tech. Bull. No. 16, ICAR Res. Complex, Shillong, India. 32 pp.
5. Mukhopadaya, S. (ed.)  
1985. The die back of mandarin oranges in Darjeeling district. Tech. Bull., BCKV, Kalyani. West Bengal, India. 12 pp.
6. Schwarz, R. E.  
1968. Indexing of greening and exocortis through fluorescent marker substances, p. 118-127. *In: Proc. 4th Conf. IOCV, Univ. Florida Press, Gainesville.*