

Diseases of Horticultural Crops:

Nematode Problems and their Management



P. PARVATHA REDDY

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*Affectionately dedicated
to the memory of my parents*

**Smt. SHIVAMMA
Shri. SANNA BASAPPA**

PREFACE

Horticulture in India is fast emerging as a major commercial venture, because of higher remuneration per unit area and the realization that consumption of fruits and vegetables is essential for health and nutrition. In the last one decade, export potential of horticultural crops has significantly increased attracting even multinationals into floriculture, processing and value added products. Horticulture development has been accorded high priority in the XIth Five Year Plan. The impact of enhanced investment in horticulture has been highly encouraging in terms of vastly improved quality production and export potential - an increase from 96.1 million tonnes in 1990-91 to 169.8 million tonnes during 2004-05. India is now the second largest producer of fruits and vegetables only next to China.

Nematodes continue to threaten horticultural crops throughout the world, particularly in tropical and sub-tropical regions. For century's man's essential crop plants have been plagued by these microscopic organisms that feed on roots, buds, stems, crowns, leaves and developing seed. Estimated overall average annual yield loss of the world's major horticultural crops due to damage by plant parasitic nematodes is 13.54%. For the seven life sustaining horticultural crops (banana, cassava, coconut, field bean, potato, sugar beet and sweet potato) that stand between man and starvation, an estimated annual yield loss of 12.77% is reported. The 16 economically important horticultural crops (cocoa, citrus, coffee, cowpea, eggplant, grapevine, guava, melons, okra, ornamentals, papaya, pepper, pineapple, tea, tomato and yam) that represent a group important for food or export value were reported to have an estimated annual yield loss of 14.31%. Monetary losses due to nematodes on 10 horticultural crops, six of which are life sustaining were estimated at US \$ 19.37 billion annually based on 1984 production figures and prices.

The destructive plant-parasitic nematodes are one of the major limiting factors in the production of horticultural crops throughout the country. Roots damaged by the nematodes are not efficient in the utilization of available moisture and nutrients in the soil resulting in reduced functional

metabolism. Furthermore, roots weakened and damaged by nematodes are easy prey to many types of fungi and bacteria which invade the roots and accelerate root decay. These deleterious effects on plant growth result in reduced yields and poor quality of horticultural crops. Nematode management is therefore, important for high yields and quality that are required by the high cost of modern crop production. Nematode management can be achieved by host resistance and by suppression of nematode population through regulatory, physical, cultural, chemical, biological and integrated methods.

The information on nematode management, especially crop-wise, is very much scattered and there is no book which deals with nematode diseases and their management entirely on horticultural crops. Hence, the present book is an attempt which comprehensively deals with the subject. This book deals with nematode diseases and their management in horticultural crops such as fruit, vegetable, ornamental, medicinal, aromatic, plantation, spice and tuber crops. Each nematode disease is described in adequate detail under the following heads: economic importance, crop losses, distribution, symptoms, hosts range, life cycle, races/biotypes, host-parasite relationship, histopathology, ecology, spread, survival, interaction with other pathogens and management. The management methods presented includes regulatory, physical, cultural, chemical, biological, host resistance and integrated approach. An entire chapter is devoted for sources of availability of critical inputs used for nematode management. Very useful information on nematode diseases and their management is provided in the Appendices. The book is adequately illustrated with about 50 figures.

This book is a practical guide to practicing farmers of horticultural crops. Further, it is a useful reference to policy makers, research and extension workers and students. The material can also be used for teaching undergraduate and post-graduate courses. Suggestions to improve the contents of the book are most welcome (E-mail: reddy_parvatha@yahoo.com). The publisher, Scientific publishers (India), Jodhpur deserves commendation for their professional contribution.

Bangalore
March 10, 2008

P. Parvatha Reddy

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