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Diseases of *Morinda* in South India and their eco-friendly management

by

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Summary and Conclusion

Naturally growing wild Noni (*M. citrifolia* L.) plants are less susceptible to diseases than commercially cultivated monocultural crop. Earlier a few diseases were reported from Hawaii, American Samoa, China and India. A “Standard Noni Disease Survey Protocol Sheet” was used in our two years disease survey to collect data on the prevalence of various diseases, their severity and other relevant information from commercial Noni farms in four southern states and also from natural stands of Noni plants in Kerala's coastal belt.

In all, 80 disease survey visits were made in 24 Noni farms across the four southern states -Andhra Pradesh, Karnataka, Kerala and Tamil Nadu, during April 2008 to March 2010. In addition, natural stands of Noni plants in five locations at coastal belts in Kerala were also observed for prevalence of diseases.

Based on the information assembled, a check list of 18 Noni diseases and three other problems was prepared. The diseases were grouped into major, potential and minor diseases according to their prevalence and importance. The diseases were found caused by fungal, bacterial (?), nematode and viral pathogens. Foliar diseases - leaf spot, shot hole, leaf blight, zonate spot and target spot - were

more commonly observed in all four states and their severity ranged from low to moderate. These diseases are relatively important during wet season.

Among the potentially important Noni diseases, “unknown disease” alone caused considerable crop loss in a few farms in Karnataka, Andhra Pradesh and Tamil Nadu during winter in 2008-2009 and 2009-2010. The disease seems to be caused by more than one pathogen. We found likely association of *A. tumefaciens* and root knot nematode (*M. incognita*) in some of the “unknown disease” infected root samples. The disease caused over 90% damage to Noni “broad leaf” plants in a farm near Kolar, Karnataka during 2008 - 2009. The other potential diseases like leaf tip blight, root rot, sooty mold, mosaic virus, fruit rot and root knot nematode caused considerable damage in a few locations. Sooty mold and fruit rot were important in higher altitudes in Karnataka and Tamil Nadu. The root rot was observed in poorly managed Noni farms during dry periods. Root knot nematode caused reasonable damage to young Noni plants in Andhra Pradesh.

Minor diseases of Noni like ring spot virus, stem blight, wilt, algal parasite, white spot and *Rhizopus* fruit rot occurred only in a very few farms. As expected, wildy growing Noni plants in coastal belt of Kannur and Kasargod districts in Kerala showed low incidence of foliar diseases. Stem gall problem was noticed only in one farm in Kerala. Even though it was observed in several plants, the fruit yield was not affected. Scorching on leaf / stem confirmed to be a physiological problem. Harvesting of all matured fruits in time could overcome this problem and also help to get higher fruit yield as well as in keeping Noni plants in healthy condition. Fruit crack, another physiological problem, was also found to occur on Noni in our surveys. Most of the diseases found in the surveys are recorded for the first time in India.

Based on diseases prevalence and their importance, a ‘Multilocation field evaluation of various bio-agents in the management of important diseases of Noni’ was carried out in one location each in Andhra Pradesh and Karnataka during 2009 - 2010 to minimize the yield losses caused by various Noni diseases. Soil application of vermicompost (4kg), neem cake (500g) along with *P. fluorescens* + *B. subtilis* + *T. viride* and *Azospirillum* + *Phosphobacterium* (500g) and foliar spray of *P.fluorescens* + *B.subtilis* (@5geach/litre) were effective in managing the foliar diseases of Noni and also showed better plant vigour.

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