

# Management of lethal leaf blight disease of coconut in Tamil Nadu

R. Bhaskaran A. Ramanathan and R. Vaithilingam  
Coconut Research Station, Tamil Nadu Agricultural University,  
Veppankulam - 614 906, Tamil Nadu

In coconut seedlings and leaflets of grown up palms spindle shaped necrotic spots appear on lower leaves. The spots enlarge and coalesce causing blighting of leaves. In seedlings, eventually the disease causes mortality. In adult palms, the leaves in the lower whorls dry and droop followed by the leaves in the upper whorl.



Leaf blight caused by *L. theobromae*

Coconut palm is affected by several lethal diseases like basal stem rot and debilitating diseases like root (wilt) causing huge economic loss to the coconut growers and to the economy of the country. Among the foliar diseases of coconut, the grey blight disease caused by *Pestalotiopsis palmarum* is ubiquitous in nature wherever coconut is grown. During the past few years, a lethal leaf blight disease caused by *Lasiodiplodia theobromae* (syn. *Botryodiplodia theobromae*) is observed in coconut in Coimbatore and Thanjavur districts of Tamil Nadu causing significant loss in coconut yield. The pathogen causes mortality of the trees. *L. theobromae* is a cosmopolitan fungus infecting the fruits of a wide range of host plants.

In coconut seedlings and leaflets of grown up palms spindle shaped necrotic spots appear on lower leaves. The spots enlarge and coalesce causing blighting of leaves. In seedlings, eventually the disease causes mortality. In adult palms, the leaves in the lower whorls dry and droop followed by the leaves in the upper whorl. Finally the crown topples down leading to the death of the tree (Nakkeeran *et al.*, 1998; Bhaskaran *et al.*, 2007). Though the lethal leaf blight has got limited

distribution in Tamil Nadu, the lethal nature of the disease warrants control measures wherever the disease is noticed. Hence, laboratory and field experiments were conducted at Coconut Research Station, Veppankulam for the management of the disease and the results are reported in this article.

## *In vitro* screening of fungicides

Laboratory screening of fungicides was done by "poisoned food technique" to assess the efficacy against *L. theobromae* using potato dextrose agar medium. The fungicides were tested at 100, 500, 1000 and 2000 ppm concentrations.

The fungicides hexaconazole and propiconazole gave 100 per cent inhibition of mycelial growth of the fungus even at 100 ppm concentration. Carbendazim, tridemorph and copper oxychloride gave 100 per cent inhibition at 500 ppm and above concentrations while mancozeb gave 100 per cent inhibition at 1000 ppm and above concentration (Table 1)

## Field experiments

A field trial was conducted with the fungicides which were found effective in the laboratory screening. TNAU coconut tonic which is

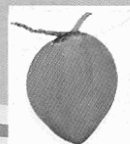


Table 1. In vitro screening of fungicides against *Lasiodiplodia theobromae*

| Fungicides         | Concentration (ppm) | Colorv diameter (cm)*    | Percent inhibition of mycelial growth over control |
|--------------------|---------------------|--------------------------|--|
| Tridemorph         | 100                 | 0.3(0.894) <sup>a</sup>  | 96.8   |
|                    | 500                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 1000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 2000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
| Carbendazim        | 100                 | 0.2 (0.835) <sup>a</sup> | 100.0  |
|                    | 500                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 1000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 2000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
| Hexaconazole       | 100                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 500                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 1000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 2000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
| Propiconazole      | 100                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 500                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 1000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 2000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
| Copper oxychloride | 100                 | 6.8 (2.702) <sup>b</sup> | 26.88  |
|                    | 500                 | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 1000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 2000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
| Mancozeb           | 100                 | 8.3 (2.966) <sup>b</sup> | 10.8   |
|                    | 500                 | 0.1 (0.775) <sup>a</sup> | 9.89   |
|                    | 1000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
|                    | 2000                | 0.0 (0.707) <sup>a</sup> | 100.0  |
| Control            |                     | 9.3 (3.135) <sup>b</sup> |  |
| C.D (P=0.05)       |                     | 0.397                    |  |

\*Mean of three replications

Figures in parentheses are  $x+0.5$  transformed values. Values followed by the same superscript are not significantly different according to DMRT.

commonly used by Tamil Nadu coconut farmers to increase the setting percentage and yield in coconut was also included in the leaf blight management trial to find out its effect on the disease intensity. This experiment was initiated during July 2005 in a farmers's field at Elankadu village of Thanjavur district. Root feeding of fungicides was given thrice at monthly interval every year. The experiment was conducted in RBD with three replications. Per cent disease index (PDI) was recorded in all the treatments three months after completion of all the treatments and the results are presented in Table 2.

Tridemorph root feeding @ 4 ml/

100 ml of water + coconut tonic root feeding has recorded the lowest per cent disease index (36.0) followed by carbendazim root feeding @ 4 g/ 100 ml of water + coconut tonic root feeding (PDI=36.2) as compared to the percent disease index of 47.2 in control palms. Tridemorph + coconut tonic root feeding has recorded the highest annual nut yield also (Table 2).

Earlier published reports on the control of *L. theobromae* is on the infection of the fungus on fruits. Hunter and Buddenhagen (1972) and Saldana *et al.* (1985) reported the control of fruit rot of papaya caused by *L. theobromae*. In the present studies, all the fungicides tested in the laboratory were inhibitory to the mycelial growth of *L. theobromae*. Though hexaconazole and propiconazole were more effective than tridemorph and carbendazim under laboratory conditions, the results of the field experiments indicate that tridemorph root feeding in combination with

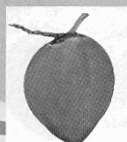
Table 2. Efficacy of fungicides and coconut tonic in the management of lethal leaf blight

| Treatments   | PDI*               | Nut yield              |                        |
|--|--------------------|------------------------|------------------------|
|  |                    | July 2005 to June 2006 | July 2006 to June 2007 |
| T <sub>1</sub> : Tridemorph root feeding 2 ml in 100ml of water  | 39.1 <sup>a</sup>  | 101                    | 97 <sup>a</sup>        |
| T <sub>2</sub> : Carbendazim rwt feeding 2g in 100 ml of water   | 38.8 <sup>a</sup>  | 97                     | 93 <sup>a</sup>        |
| T <sub>3</sub> : T1+coconut tonic 40 ml with 160 ml of water   | 37.2 <sup>a</sup>  | 103                    | 105 <sup>d</sup>       |
| T <sub>4</sub> : T2+ coconut tonic 40 ml with 160 ml of water  | 37.5 <sup>b</sup>  | 104                    | 109 <sup>c</sup>       |
| T <sub>5</sub> : Tridemorph root feeding 4 ml in 100 ml of water + coconut tonic 40 ml with 160 ml of water  | 36.0 <sup>b</sup>  | 109                    | 120 <sup>c</sup>       |
| T <sub>6</sub> : Carbendazim root feeding 4 g in 100 ml of water + coconut tonic 40 ml with 160 ml of water. | 36.2 <sup>ab</sup> | 105                    | 112 <sup>c</sup>       |
| T <sub>7</sub> : Hexaconazole root feeding 4 ml in 100 ml of water   | 37.0 <sup>a</sup>  | 94                     | 96 <sup>c</sup>        |
| T <sub>8</sub> : Propiconazole root feeding 4 ml in 100 ml of water  | 37.5 <sup>b</sup>  | 90                     | 97 <sup>c</sup>        |
| T <sub>9</sub> : Control   | 47.2 <sup>d</sup>  | 87                     | 78 <sup>e</sup>        |
| C.D (P=0.05)   | 0.984              | NS                     | 2.1                    |

\* Mean of three replications

NS- Not Significant

Values followed by the same superscript are not significantly different according to DMRT.



root feeding of TNAU coconut tonic is highly effective in the management of the lethal leaf blight. This treatment gave the highest mean nut yield also. Hence, for the effective management of lethal leaf blight disease of coconut, root feeding of 4 ml of tridemorph in 100 ml of water thrice at monthly interval along with root feeding of TNAU coconut tonic @ 40 ml with 160 ml

of water at six monthly interval can be adopted.

### References

- Bhaskaran, R., Karthikeyan, A., Marimuthu, R., Ramanathan, A. and Sundaram, T. 2007. Leaf blight disease of coconut palm, *Indian Coconut Journal* 37 (11):2-5
- Hunter, J. E. and Buddenhagen, I. W. 1972. Incidence, epidemiology and control of fruit disease of papaya in Hawaii. *Trop. Agri. (Trinidad)* 49: 61-71.

*Agri. (Trinidad)* 49: 61-71.

- Nakkeeran, S., Sridharan, C.S., Karivaratharaju, T.V., Valluvaparidasan, P. and Renuka Devi, P. 1998. Lethal leaf blight of coconut. *TNAU News letter* 28 (4): 1.
- Saldana, M.I., Marquez, M. and Ruiz, P. 1985. Identificacion de enfermedades fungosales del cultivo de la papaya (*Carica papaya* L.) en el estado de Tamasco. *Revista Mexicana de Fitopatologia* 3: 14-17.

### PERIODICALS

1. Indian Coconut Journal (English Monthly) (For Libraries & Institutions) Foreign Countries
2. Bharatiya Nariyal Patrika (Hindi Quarterly)
3. Indian Naliker Journal (Malayalam Monthly)
4. Bharatiya Thengu Patrike (Kannada Quarterly)
5. Indhia Thennai Idhazh (Tamil Quarterly)

### BOOKS

#### English

1. Processing & Marketing of Coconuts in India (SPAMCO II)
2. Intensified Coconut Production with Floriculture
3. Horticulture Development in India - Issues and Strategies 680.00
4. Trends in Coconut Research and Development in India
5. Study on the effects of consumption coconut kernel and coconut oil on the serum lipid profile
6. Indian Spices - Production and Utilization
7. Coconut Processing Technologies
8. Prospects of Coconut Based Cropping System in West Bengal
9. Plantation Crops Research and Development in the New Millennium
10. Problems and Prospects of Coconut in North-Eastern Region of India
11. Coconut Products
12. Sustainable Production and Utilization of Coconut
13. Eriophyid Mite - Issues and Strategies
14. Coconut Marketing in India - Issues and Strategies
15. Home Made Foods from Coconut
16. Tender Coconut
17. Risk Management and Capacity Building for Coconut - Copra Enterprises in India
18. Global Coconut Industry-Outlook for the future

#### Hindi

1. Nariyal Vikas Ke Vividh Aayam (for Libraries & Institutions Rs. 100 + Postage)
2. Bagwani Sabdaval (Horticulture glossary)

#### Malayalam

1. Thondum Chirattayam
2. Kera Bhakshyolpannangal
3. Velichennayum Pinnakkum
4. Naliker Samskaranavum Vipanavum
5. Manushya Poshanathil Velichanna

#### Tamil

1. Thennai

The subscription or cost as the case may be sent in advance by MO/DD to the Chairman, Coconut Development Board, Kera Bhavan, Kochi - 682 011. Please note that we do not send our publications by V.P.P. Subscription for Kannada Journal may be remitted in favour of the Director, Regional Office, Coconut Development Board, Hulimavu, Bannerghatta Road (Beside Horticulture Farm, Govt. of Karnataka, Bangalore South Taluk, Bangalore - 560 076. Ph : 080-6593750. Write your address in CAPITAL LETTERS in M.O. Form as well as in all correspondence.

|  | Life Subscription<br>Rs | Annual Subscription<br>Rs. |
|--|-------------------------|----------------------------|
|  | 1600.00                 | 60.00                      |
|  | 5000.00                 | 200.00                     |
|  |                         | US \$ 100.00               |
|  | 1000.00                 | 40.00                      |
|  | 1000.00                 | 40.00                      |
|  | 1000.00                 | 40.00                      |
|  | 1000.00                 | 40.00                      |
|  | Price                   | Postage                    |
|  | 100.00                  | 36.00                      |
|  | 150.00                  | 52.00                      |
|  | 52.00                   |                            |
|  | 50.00                   | 36.00                      |
|  | 250.00                  | 52.00                      |
|  | 200.00                  | 68.00                      |
|  | 50.00                   | 36.00                      |
|  | 20.00                   | 36.00                      |
|  | 1000.00                 | 68.00                      |
|  | 200.00                  | 36.00                      |
|  | 100.00                  | 36.00                      |
|  | 150.00                  | 36.00                      |
|  | 160.00                  | 36.00                      |
|  | 200.00                  | 36.00                      |
|  | 20.00                   | 36.00                      |
|  | 50.00                   | 36.00                      |
|  | 50.00                   | 36.00                      |
|  | 200.00                  | 36.00                      |
|  | 50.00                   | 36.00                      |
|  | 50.00                   | 36.00                      |
|  | 3.00                    | 21.00                      |
|  | 2.00                    | 21.00                      |
|  | 2.00                    | 21.00                      |
|  | 30.00                   | 36.00                      |
|  | 10.00                   | 36.00                      |
|  | 50.00                   | 36.00                      |