

Prevalence of basal stem rot (BSR) disease of coconut in coastal and inland districts of Tamil Nadu

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Abstract : Field survey on the incidence of Basal Stem Rot (BSR) disease of coconut was conducted in eleven coastal districts viz., Thiruvallur, Villupuram, Cuddalore, Nagapattinam, Thiruvarur, Thanjavur, Pudukkottai, Ramanathapuram, Tuticorin, Kanyakumari and Chengalpattu and in nine inland districts viz., Madurai, Dindigul, Tiruchirapalli, Karur, Perambalur, Salem, Namakkal, Dharmapuri and Krishnagiri of Tamil Nadu. In Tamil Nadu, the district-wise incidence of BSR disease in coconut ranged from 0.11 to 5.43 per cent with a mean incidence of 2.06 per cent. The incidence of BSR ranged from 1.06 to 5.43 per cent with a mean incidence of 3.64 per cent in the coastal districts of Tamil Nadu. In the inland districts, the incidence of BSR ranged from 0.11 to 2.15 per cent with a mean incidence of 0.30 per cent only.

Key words : Basal stem rot, Coconut, Incidence, Crop loss

Introduction

Coconut is an important plantation as well as oil seed crop, which is being cultivated in almost all places of Tamil Nadu, Kerala and Karnataka. This is grown in homestead gardens as well as on plantation scale. Coconut palm is affected by more than 50 diseases in different parts of the world. Among them the Basal Stem Rot (BSR) of coconut caused by *Ganoderma* spp. has been recognized as a serious disease limiting coconut production in India. BSR of coconut also called Thanjavur wilt was first noticed in the year 1952 in Thanjavur district of Tamil Nadu (Vijayan and Natarajan, 1972). Several workers conducted survey on the incidence of BSR disease in Tamil Nadu. But a complete and updated detail on the incidence of BSR disease in the coastal and inland districts of Tamil Nadu is not available. Similarly no systematic and scientific survey has been made on the incidence of BSR disease in Tamil Nadu. Hence in the present study, a detailed and systematic survey has been made on the incidence of BSR disease in coconut.

Materials and methods

The incidence of basal stem rot disease of coconut in eleven coastal districts viz., Thiruvallur, Villupuram, Cuddalore, Nagapattinam, Thiruvarur, Thanjavur, Pudukkottai, Ramanathapuram, Tuticorin, Kanyakumari and Chengalpattu and in nine inland districts viz., Madurai, Dindigul, Tiruchirapalli, Karur, Perambalur, Salem, Namakkal, Dharmapuri and Krishnagiri of Tamil Nadu, India was assessed. The per cent disease incidence was assessed by adopting simple random sampling technique (roving survey). In each block of the above districts, two villages were selected and in each village two coconut groves were identified randomly for the survey.

In addition to survey on the incidence of BSR disease, the crop loss due to BSR disease was also assessed in the above districts. To assess the loss, ten villages in each district were selected randomly. Observations on the incidence of BSR, average yield of the palms / gardens and market price of coconut were made. The yield loss and its value in terms of rupees were calculated by

$$\text{Yield loss (nut reduction) / ha} = \frac{\text{Number of BSR infected palms} \times \text{Average nut yield / palm}}{\text{Total number of palms surveyed (in the district)}} \times \text{Total number of Palms / ha}$$

$$\text{Per hectare loss (in terms of rupees)} = \text{Yield loss/ ha (no. of nuts)} \times \text{Local market price / nut}$$

Results and Discussion

The results of the survey revealed that the mean incidence of BSR disease of coconut was 3.64 per cent in the coastal districts of Tamil Nadu. A maximum incidence of 5.43 per cent was recorded in Thanjavur district. It was followed by Chengalpattu (5.09%) and Thiruvavur (3.52%) districts (Table 1).

The incidence of BSR disease in coconut was the minimum in Villupuram district with an incidence of 1.06 per cent followed by Pudukkottai (1.84 per cent) among the coastal districts of Tamil Nadu.

The village wise incidence ranged from 0.0 to 46.37 per cent in the coastal districts (Table 1).

The mean incidence of BSR disease of coconut in the inland districts was found to be 0.35 per cent only (Table 2). A maximum incidence of 2.15 was recorded in Madurai district followed by Dindigul (0.77%) and Perambalur (0.52%). The incidence of BSR was minimum in Namakkal and Dharmapuri districts with a mean incidence of 0.11 per cent followed by Krishnagiri (0.13%) among the inland districts of Tamil Nadu. The village wise incidence ranged from 0 to 4.80 per cent (Table 2).

Table 1. Incidence of basal stem rot disease of coconut and its impact on nut yield in the coastal districts of Tamil Nadu

S. No	Name of the district	Total No. of trees	No. of BSR affected trees	Mean disease incidence (%)	Average nut yield/palm	Average yield reduction (No. of nuts/ha)	Annual loss/ha (Rs.)
1.	Thanjavur	24802	1348	5.43	48	457	1369
2.	Nagapattinam	8066	231	2.86	77	386	1157
3.	Tiruvavur	3385	119	3.52	103.6	637	1912
4.	Pudukkottai	3970	73	1.84	40.4	222	667
5.	Ramanathapuram	7920	163	2.06	44.2	159	478
6.	Tuticorin	4640	85	1.83	47.3	151	454
7.	Cuddalore	2615	67	2.56	157.1	544	1631
8.	Chengalpattu	2319	118	5.09	61.2	420	1261
9.	Kanyakumari	1155	34	2.94	127.4	506	1517
10.	Villupuram	2080	22	1.06	27.9	52	156
11.	Thiruvallur	2000	33	1.65	79.9	230	690
Total / Mean		62952	2293	3.64	74.0	342	1027

Table 2. Incidence of basal stem rot disease of coconut and its impact on nut yield in inland districts of Tamil Nadu

S. No	Name of the district	Total No. of trees	No. of BSR affected trees	Mean disease incidence (%)	Average nut yield/palm	Average yield reduction (No. of nuts/ha)	Annual loss/ha (Rs.)
1.	Madurai	3725	80	2.15	81.9	237	712
2.	Dindigul	1945	15	0.77	83.1	86	259
3.	Thiruchirapalli	14025	29	0.21	85.2	75	224
4.	Karur	6873	32	0.47	84.0	71	212
5.	Perambalur	1340	7	0.52	89.7	82	246
6.	Salem	5026	10	0.20	92.2	38	14
7.	Namakkal	9905	11	0.11	80.3	16	48
8.	Dharmapuri	7010	8	0.11	59	12	36
9.	Krishnagiri	8585	11	0.13	64	15	45
Total / Mean		58434	203	0.35	80	70	211

Studies on the assessment of yield loss due to BSR disease in the coastal districts of Tamil Nadu revealed that the loss was maximum in Thiruvavur district with an average reduction of 637 nuts/ha (Rs.1912/ha) followed by Cuddalore with an average reduction of 544 nuts/ha (Rs.1631/ha) and Kanyakumari with an average reduction of 506 nuts/ha (Rs.1517/ha). The mean yield loss due to BSR disease in the coastal districts was found to be 342 nuts/ha (Rs.1027/ha) (Table 1).

Among the inland district of Tamil Nadu the yield loss in coconut due to BSR disease was maximum in Madurai with an average reduction of 237 nuts/ha (Rs. 712/ha) followed by Dindigul with an average reduction of 86 nuts/ha (Rs.259/ha). An average reduction of 70 nuts/ha (Rs. 211/ha) was recorded in the inland districts of Tamil Nadu. The yield loss was very minimum in Dharmapuri district with an average reduction of only 12 nuts/ha followed by Krishnagiri (15 nuts/ha) and Namakkal (16 nuts/ha) (Table 2).

Till 1966, the BSR disease of coconut was confined to the coastal areas of Tamil Nadu and the

incidence ranged from 3.3 to 10.8 per cent with the highest incidence (10.8%) in Thanjavur district followed by Ramanathapuram (4.0%), South Arcot (3.5%), Kanyakumari (3.3%) and Chengalpattu (3.3%) districts. In 1978, the disease was noticed in all the districts of Tamil Nadu and incidence ranged from 0.6 to 4.9 per cent (Bhaskaran and Ramanathan, 1984). Observation made during 1990 - 92 in Tuticorin, Kanyakumari and Coimbatore districts indicated that the disease is widespread in these places also and in some of the worst affected gardens in Tuticorin district, the incidence was as high as 25 per cent (Bhaskaran *et al.*, 1996). Survey conducted in Thanjavur during 1998 showed that the mean disease incidence has gone upto 17.1 % (Anonymous, 1998).

Satyanarayana *et al.* (1985) reported that the BSR disease of coconut is mainly prevalent in lighter soils in coastal districts of Andhra Pradesh. Karunanithi *et al.* (2004) also reported that in the coastal districts of Tamil Nadu, incidence of BSR in diseased gardens ranged from 0.0 to 46.37 per cent with a mean incidence of 4.64 per cent.

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