



## EPIDEMIOLOGY AND MANAGEMENT OF MYROTHECIUM LEAF SPOT OF BAEI (*AEGLE MARMELLOS* CORREA) IN NURSERY

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### Abstract

The bael (*Aegle marmelos* Correa) is an important indigenous fruit of arid regions. To test the effect of fungicides against *Myrothecium* leaf spot, a field experiment was conducted at Main Experimental Station Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad during 2015-2016. The results showed minimum disease intensity (PDI 7.41) was recorded in plants having the treatment with Propiconazole @ (0.1%) which was found most effective chemical followed by difenconazole @ (0.1%) (PDI 8.34) and mancozeb @ (0.2%) (PDI 11.96). However, control (untreated) plants showed maximum disease intensity (PDI 30.21). Correlation matrix studies indicated that, Temperature (minimum), Relative humidity (morning) showed highly significant negative correlation whereas maximum temperature and rainfall showed highly significant positive correlation with PDI. Sunshine hrs/day also showed significant positive correlation.

**Key words :** *Aegle marmelos*, bael, *Myrothecium roridum*, fungicide, randomized block design (RBD).

### Introduction

The bael (*Aegle marmelos* Correa) is an important indigenous fruit is native to India and sacred plant to Hindus. Bael belongs to family rutaceae. The bael tree is very hardy and can grow under adverse agro-climatic condition. It has capacity to adapt successfully to a wide range of habitat from arid, semi arid to mesophytic condition and a wide temperature tolerance (from 7°C to 48°C). The bael fruit is one of the most nutritious fruits, it contain 61.5 g water, 1.8 g protein, 0.39 mg thiamine, 1.19 mg fat, 87 mg riboflavin, 1.1 mg niacin, 55 mg Vitamin A, 85 mg calcium, 50 mg phosphorus, 600 mg Potassium and 8 mg vitamin 'C' per 100 g of edible portion (Gopalan *et al.*, 1971). No other fruit has such a high content of riboflavin. The ripe fruit is a tonic, restorative, astringent, laxative and good for heart and brain. The unripe fruit is regarded as astringent, digestive and stomachic and is usually prescribed for diarrhea and dysentery. Anti-diarrheic activity of bael root was studied by Pitre and Srivastava (1987). Nursery plants suffers from number of fungal diseases namely root rot caused by *F.solani*, leaf spot caused by *Myrothecium roridum*, *Alternaria alternata* and *Fusarium pallidoroseum*. Among them *Myrothecium* leaf spot caused much vegetative loss to

nursery plants (Anonymous, 2010). Keeping in view the importance of the bael crop and seriousness of the fungal foliar disease, at nursery stage present research work have been undertaken with the effect of weather parameters on diseases development and efficacy of different fungicides against leaf spot disease caused by *Myrothecium roridum*.

### Materials and Methods

A field experiment was conducted on bael nursery at Main Experimental Station, Horticulture, Narendra Deva University of Agriculture & Technology, Faizabad (U.P.), India in Randomized Block Design with three replications during 2015-2016. For the management of *myrothecium* leaf spot, five fungicides viz. (carbendazim 0.1%, mancozeb 0.2%, copper oxychloride 0.2%, Propiconazole 0.1%, and Difenconazole 0.1%) were applied. Three foliar applications were given at 15 days intervals starting from initiation of disease. The per cent disease intensity (PDI) were recorded 20 days after last spray. The per cent disease intensity and per cent disease control were calculated by 0-5 point scale of Vincent (1947). For epidemiological studies, weather data were recorded from meteorological department of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad and weekly disease intensity(PDI)

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were recorded from experiment and correlated with weather data.

### Scale for disease intensity

Rating	Average disease intensity in (%)	Per cent area covered with disease infection
0	0%	No infection
1	0.1-5 %	0.1-5% area covered
2	5.1-20 %	5.1-20% area covered
3	20.1-50 %	20.1-50% area covered
4	50.1-75%	50.1-75% area covered
5	75.1-100%	75.1% or above

Per cent disease intensity and per cent disease control were calculated by using the following formula :

$$PDI = \frac{\text{Sum of all numerical rating}}{\text{Total no. of leaves examined} \times \text{highest rating}} \times 100$$

$$PDC = \frac{\% \text{ disease in control} - \% \text{ disease in treatment}}{\% \text{ disease in control}} \times 100$$

## Results and Discussion

Myrothecium leaf spot symptoms recorded during first week of July. Symptoms appeared on leaves as small, circular in shape which are brown in colour but later these spot enlarge and covered the more area. Chlorosis around the lesion and concentric rings may be seen. In severe condition, number and size of lesions increased, sporodochia may be seen on older lesion in circle, were black in colour. The disease symptoms were recorded during 2<sup>nd</sup> week of July (29<sup>th</sup> meteorological week) when

weather factors viz., temperature maximum (32.80°C) and minimum (27.00°C), relative humidity morning (84.80%) and evening (70.70%), sunshine hrs/day (4.70) and rainfall (28.00mm.) were observed. It also recorded that disease increased very fast when rain occurred as shown in table 1.

Maximum PDI (30.21) were recorded in 42<sup>nd</sup> meteorological week when weather parameters viz. temperature maximum (35.20°C) and minimum (19.20°C), relative humidity morning (70.40%) and evening (52.10%), sunshine hrs (5.80) and rainfall (0.0mm). Correlation matrix studies indicated that, temperature (minimum), relative humidity (morning) showed highly significant negative correlation whereas maximum temperature and rainfall showed highly significant positive correlation with PDI. Sunshine hrs/day also showed significant positive correlation (table 2). Singh *et al.* (2003) also found similar result in case of Myrothecium leaf spot pigeon pea (cv.T-21) in epidemiological studies.

Results presented in table 3 indicated that minimum disease intensity (PDI 7.41) was recorded in plants having the treatment with Propiconazole @ (0.1%) which was found most effective fungicide followed by difenconazole @ (0.1%) (PDI 8.34) and mancozeb @ (0.2%) (PDI 11.96).in case of management (untreated) plants showed maximum disease intensity (PDI 30.21), maximum disease control (75.12%) was recorded in Propiconazole treated plants followed by difeconazole (73.67%) and mancozeb (57.71%), respectively.

**Table 1 :** Myrothecium leaf spot of bael disease and its correlation with weather parameters.

Date of observation	Meteorological week	Temperature (°c)		Relative humidity (%)		Rain fall (mm)	Sunshine (hrs/day)	PDI
		Max.	Min.	M	E			
18.7.015	29	32.80	27.00	84.80	70.70	28.00	4.70	1.00
25.7.015	30	33.70	26.70	84.50	69.50	2.00	6.10	2.5
1.8.015	31	32.00	26.00	85.80	69.80	6.80	3.60	2.6
8.8.015	32	36.30	25.90	84.70	66.80	13.80	5.60	4.2
15.8.015	33	35.50	26.50	88.00	71.50	29.20	4.20	4.8
22.8.015	34	34.20	29.40	85.40	67.20	23.60	6.40	6.5
29.8.015	35	34.90	26.20	84.50	71.20	00.00	6.50	8.2
5.9.015	36	36.60	24.50	78.20	51.10	00.00	8.00	12.5
12.9.015	37	36.00	25.70	82.20	64.00	00.00	5.40	16.80
19.9.015	38	35.90	25.80	80.00	58.20	15.20	6.90	20.30
26.9.015	49	35.70	22.30	72.00	49.80	00.00	6.70	25.80
1.10.015	40	31.20	21.00	67.10	49.50	00.00	6.80	28.50
8.10.015	41	34.30	20.30	67.00	46.80	00.00	7.00	30.00
15.10.015	42	35.20	19.20	70.40	52.10	00.00	5.80	30.21

**Table 2 :** Correlation coefficient of PDI of Myrothecium leaf spot of bael With weather parameters.

S. no.	Weather parameters	Per cent disease index of leaves
1	Maximum temperature	0.791**
2	Minimum temperature	-0.723**
3	Relative humidity (morning)	-0.940**
4	Relative humidity (evening)	0.153
5	Rainfall (mm)	0.655**
7	Sun shine hrs/day	0.594*

\* Significant, \*\* Highly significant.

**Table 3 :** Effect of fungicides on Myrothecium leaf spot of bael.

Treatments	Concentrations	Disease intensity (%)	Disease control (%)
Carbendazim 50 WP	0.1%	14.83	48.59
Mancozeb 75 WP	0.2%	11.96	57.71
Copper oxychloride 50 WP	0.2%	14.41	52.73
Propiconazole 25 EC	0.1%	7.41	75.12
Difenconazole 35 EC	0.1%	8.34	73.67
Control	-	30.21	-
CD at 5%		1.030	

Efficacy of fungicides *viz.* Carbendazim, mancozeb, copper oxychloride, propiconazole and difenconazole were tested under field condition on Myrothecium leaf spot of bael indicated that all the treatments were found significantly superior over control. Propiconazole @ 0.1% minimize the disease intensity (PDI 7.41) controlled

disease over 75.12%, followed by difenconazole and mancozeb which showed PDI (8.34 & 11.96), per cent disease control (73.67 & 57.71), respectively. Maximum (PDI 30.21) was recorded in untreated plants. It is apparent from the results that spraying of different fungicides significantly reduced the disease incidence, providing superiority of the fungicidal treatment over the control. Singh *et al.* (2008) tested Nine fungicides in the laboratory and also under field condition. Of them, Benomyl, Metalaxyl, Bavistin and Topsin M completely inhibited the growth of Myrothecium leaf spot of grapevine. These effective fungicides were used in field experiments as sprays and it was observed that Bavistin, Benomyl and Metalaxyl were effectively managed the disease.

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