

Study of incidence and severity of leaf spot disease in *Jatropha curcas* L.

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Key words : Incidence, Severity, Leaf spot, *Jatropha curcas*

Jatropha (*Jatropha curcas* L.) is a multipurpose crop. In general, the *Jatropha* is considered to be free from various diseases and pests. However, some diseases have been reported recently. The moderate incidence of leaf spot disease was observed in the *Jatropha* plantation at central farm, Marathwada Agricultural University, Parbhani (M.S.). The leaf spot disease was observed on *Jatropha* plant from July to first fortnight of November. The disease incidence was maximum in the month of August and subsequently it decreased up to November. In general, the symptoms of leaf spot disease were developed in rainy season. The disease was not observed in the month of November second fortnight and onwards when the temperatures and humidity were low.

Jatropha (*Jatropha curcas* L.) is an important multipurpose plant belonging to the family Euphorbiaceae. It is believed to be a native of South America and Africa but later spread to other countries of the world. Today it is found in almost all the tropical and sub tropical regions of the world.

In general, the *Jatropha* is considered to be free from different diseases and pests. However, some diseases viz., Root rot (*Cilocybe tabescens*), Leaf spot (*Colletotrichum gloeosporoides*) and Rust (*Phakospora jatrophiicola*) have been reported by Duke (1983). Also foliar diseases caused by *Alternaria* sp., *Dothiorella* sp., *Oidium* sp., and *Fusarium* sp. were reported in addition to the bacterial angular spot caused by *Xanthomonas* sp. on *Jatropha curcas* in Nicaragua (Padilla and Monterroso, 1999). Rangaswamy *et al.* (2005) observed mosaic disease symptomatologically resembling *Jatropha* Mosaic Virus (JMV) disease on some naturally grown *Jatropha curcas* plants during 2004 in Kolar and Bangalore districts of Karnataka state. Leaf spot disease of *Jatropha* caused by *Colletotrichum gloeosporioides* Penz. was found in "Jatropha plantation at Biodiversity cum Genomic Valley Park", Dr.B.S. Konkan Krishi Vidyapeeth, Dapoli (Watve, 2006).

The leaf spot disease of *Jatropha* caused by *Alternaria alternata* (Fr.) Keissler was observed in the *Jatropha* plantation at central farm, Marathwada

Agricultural University, Parbhani in 2006. Hence, study of incidence and severity was undertaken.

Survey of leaf spot of *Jatropha*:

The *Jatropha* plantation is undertaken at Central Farm of Marathwada Agricultural University, Parbhani on an area of 300 ha under "Development of Elite Nursery Raising and Model Plantation of *Jatropha*," sponsored by National Oilseeds and Vegetables Oils Development Board. The survey studies regarding incidence and intensity of leaf spot disease was undertaken from July to November, 2006 at fortnightly intervals.

Per cent disease incidence:

Per cent incidence was calculated from the number of infected plants against the total number of plants at the time of observation by using following formula :

$$\text{Per cent incidence (PI)} = \frac{\text{No. of diseased plants}}{\text{Total no. of plants}} \times 100$$

Per cent disease intensity:

Per cent disease intensity (severity) was calculated as per the standard area diagram and 0 to 9 disease rating scale developed by Mayee and Datar (1986). For this purpose two leaves located at the bottom, two middle and two top of the plant were chosen and scored as per scale i.e. for leaf area infected 0 %, less than 1 %, 1 to 10 %, 11 to 25 %, 26 to 50 % and more than 50 % scored 0, 1, 3, 5, 7 and 9, respectively.

The average intensity of each plot was worked out by using following formula:

$$\text{PDI} = \frac{\text{Summation of all numerical rating}}{\text{Total no. of leaves observed} \times \text{max. rating scale}} \times 100$$

where,

PDI = Per cent disease intensity.

Measurement of disease intensity (severity) were carried out on two randomly selected plants in each plot.

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RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Survey of leaf spot:

Fifteen plots were selected for the study of disease incidence at the Central Farm of Marathwada Agricultural University, Parbhani and 25 plants were randomly selected in each plot. The meteorological parameters viz., temperature, relative humidity and rainfall from July to Nov., 2006 in Parbhani is graphically presented in Fig.1A.

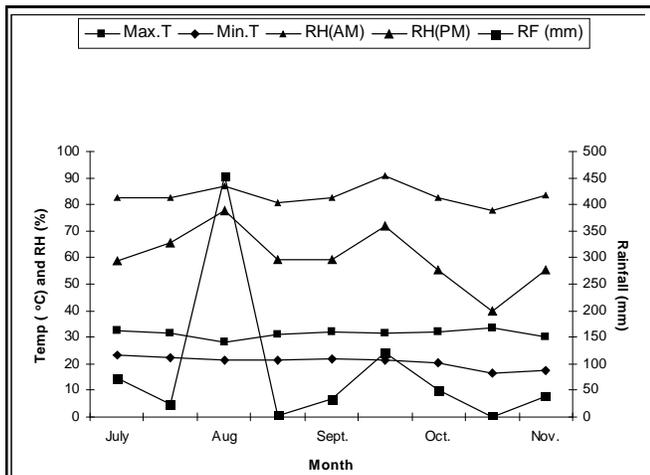


Fig 1 A : Temperature (°C) and Relative humidity (%) from July to Nov., 2006 in Parbhani

Disease incidence:

The incidence of *Alternaria* leaf spot in *Jatropha* are presented Table 1. The results indicated that leaf spot was observed from July to first fortnight of November, 2006. The incidence of disease was low in the month of July (6.93 per cent). Thereafter, the incidence was increased gradually up to August and subsequently it decreased in the month of September, October and first

Table 1 : Per cent disease incidence and per cent intensity of leaf spot of *Jatropha*

Period	PI (%)	PDI (%)
1 July – 15 July	6.93	14.19
16 July – 31 July	28.80	27.77
1 Aug. – 15 Aug.	57.07	41.97
16 Aug.– 31 Aug.	70.67	56.78
1 Sept. – 15 Sept.	60.53	45.67
16 Sept.– 31 Sept.	55.20	33.33
1 Oct. – 15 Oct.	30.93	20.37
16 Oct.– 31 Oct.	19.73	14.81
1 Nov. – 15 Nov.	4.26	7.40

fortnight of November (Fig.1B). The highest disease incidence (70.67 per cent) was noticed in the second fortnight of August. Thus the disease was observed during the rainy season. There was no disease observed in the month of November second fortnight and onwards when the temperatures and humidity were low.

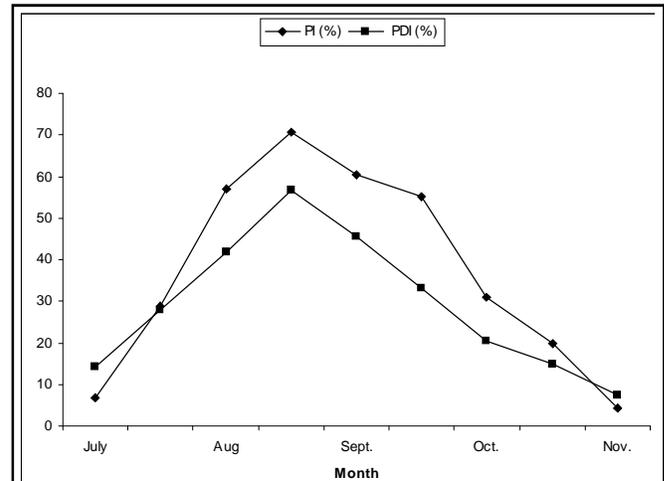


Fig 1 B : Per cent incidence and per cent disease intensity of leaf spot of *Jatropha*

Disease intensity:

The data on per cent disease intensity (PDI) indicated that it was 14.19 per cent in July first fortnight and increased up to second fortnight of August (56.78 per cent). Thereafter PDI was decreased up to first fortnight of November (7.40 per cent). The PDI decreased with decrease in temperature and humidity (Fig.1B).

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Received : May, 2009; Accepted : July, 2009