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# Evaluation of Soybean Entries/Varieties against Myrothecium Leaf Spot (*Myrothecium roridum*) under Field Conditions

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**A B S T R A C T**

Myrothecium leaf spot of soybean caused by *Myrothecium roridum.* Fifty six entries/varieties of soybean were screened under natural field condition for resistance of myrothecium leaf Spot of soybean. Thirty seven entries/varieties exhibited highly resistant, sixteen entries/varieties were found moderately resistant, three entries/varieties were found moderately susceptible. The maximum PDI was observed in JS 72-44 (40.05%) followed by NRC 122 (36%) and JS 71-05 (35.5%) under moderately susceptible grouped and the minimum PDI was recorded in JS 72-280 (2.00%) followed by shivalik (2.20%) and RSC 10-13 (2.30%) under highly resistant grouped. None of the entries/varieties were categorized in absolutely resistant, susceptible and highly susceptible categories.

## Introduction

Soybean (*Glycine max. (*L.) Merril) belonging to family Leguminaceae is designated as miracle bean established its potential as an industrially vital and viable oilseed crop in many areas of India. Leaf spot of soybean is caused by *Myrothecium roridum* Tode ex.

Fries is an important disease, which occurred in epidemic proportion entailing into colossal losses to soybean crop in Madhya Pradesh (Shrivastava and Khan, 1994, Singh and Shrivastava, 1994).

Myrothecium leaf spot of soybeanis occurring in almost all the major soybean growing areas of India causing about 30 per cent yield loss (Shrivastava and Khan, 1994). The disease severity of myrothecium leaf spot soybean was in the range of 35 to 45 % and disease incidence of myrothecium leaf spot soybean was in the range of 30 to 55 % (Singh and Shrivastava, 1994). *Myrothecium roridum*is ordinary soil fungi, and survive in this environment as saprophytes in decaying plant tissues (Ellis, 1971).

Initial symptoms of the disease appear as small round or oval, brown spots with dark brown margin on leaves in the infected plant. Since it is an economically important disease, management of the disease plays crucial role.

There are numerous reports on resistance varieties to control the disease. Talukdar (2011) reported that out of 56 varieties, 50 varieties showed highly resistant reaction while remaining 6 varieties were found moderately resistant. None of the varieties found in absolutely resistant, moderately susceptible, susceptible and highly susceptible categories.

## Materials and Methods

### Experimental site

The field experiment was conducted at the research farm, IGAU Raipur, in kharif season 2015. Fifty-six soybean entries/varieties were screened which was sown on 4th July 2015. The entries/varieties were sown in three rows of 3.2mleanthwith the 30 cm row distance and 5cm plant distance.

All the recommended agronomic practices were adopted. The observations on natural occurrence of *M. roridum* on soybean leaf were recorded at regular interval. For calculation of disease severity five plant of each variety were randomly selected and tagged.

Observation on of the disease severity of the foliage was recorded by using 0-9 scale according to Singh *et al.*, (1982) and per cent disease index (PDI) was worked out.

Where,

0 - No lesions

1 - 1% leaf area covered with lesion

3 - 1.1 - 10 % leaf area covered with lesion

5 - 10.1 – 25 % of the leaf area covered no defoliation, little damage

7 - 25.1 – 50 % leaf area covered, some leaf drop, death of a few plant damage conspicuous.

9 -More than 50% leaf area covered, lesion very common on all plants, defoliation common, death of plant common, damage more than 50%.

PDI was calculated using the formula of Wheeler (1969) as given here

$$\text{Percent Disease Index (PDI)} = \frac{\text{Sum of individual rating}}{\text{Number of leaves examined}} \times \frac{100}{\text{Maximum disease rating}}$$

On the basis of PDI and disease scale of ICAR-IISR 2010-11 the entries/varieties were classified as followed.

## Results and Discussion

The data presented in Table 1 and 2indicates that out of 56 entries/varieties, 37entries/varieties, showed highly resistance reaction, 16 entries/varieties, were found moderately resistant and 3 were found moderately susceptible.

None of the entries/varieties found in absolutely resistant, susceptible and highly susceptible categories.

The maximum PDI was observed in JS 72-44 (40.05%) followed by NRC 122 (36%) and JS 71-05 (35.5%) under moderately susceptible grouped and the minimum PDI was recorded in JS 72-280 (2.00%) followed by shivalik (2.20%) and RSC 10-13 (2.30%) under highly resistant grouped (Table 2).

From the result, it is clear that maximum entries/varieties exhibited resistant reaction for the disease of Myrothecium leaf spot of soybean.

**PDI and disease scale of ICAR-IISR 2010-11**

| Infection % | Reaction category |
|---|---|
| 0 | Absolutely resistant |
| 0.01-11.11% | Highly Resistant |
| 11.12 -33.33% | Moderately resistant |
| 33.34-55.55% | Moderately Susceptible |
| 55.56-77.77% | Susceptible |
| 77.78.-100% | Highly Susceptible |

**Table.1** Percent disease index of various soybean entries

| S. N. | Name of entries | Percent disease index | S. N. | Name of entries | Percent disease index |
|---|---|---|---|---|---|
| 1 | JS 75-46 | 4.50 | 29 | TS 72 | 3.80 |
| 2 | JS 72-280 | 2.00 | 30 | DS 3103 | 3.00 |
| 3 | PK 262 | 2.50 | 31 | NRC 118 | 10.50 |
| 4 | PK 472 | 3.50 | 32 | PS 1572 | 2.60 |
| 5 | MACS 58 | 6.20 | 33 | MACS 1480 | 3.40 |
| 6 | JS 93-05 | 5.20 | 34 | AMS100-1 | 4.50 |
| 7 | Punjab1 | 4.10 | 35 | Himso 1686 | 8.90 |
| 8 | Bragg | 5.10 | 36 | KDS 775 | 9.00 |
| 9 | Monetta | 5.00 | 37 | VLS 90 | 10.10 |
| 10 | KHSB 2 | 5.60 | 38 | JS 72-44 | 40.50 |
| 11 | VLS 58 | 3.20 | 39 | JS 71-05 | 35.50 |
| 12 | NRC 7 | 2.50 | 40 | JS 335 | 13.00 |
| 13 | Shivalik | 2.20 | 41 | KDS754 | 12.00 |
| 14 | PS 1569 | 4.10 | 42 | RVS 2010-2 | 13.00 |
| 15 | RVS 2010-1 | 4.40 | 43 | RSC 10-29 | 14.00 |
| 16 | DSb 30-2 | 4.50 | 44 | MAUS 740 | 22.00 |
| 17 | RSC 10-13 | 2.30 | 45 | NRS 122 | 36.00 |
| 18 | MACS 1491 | 3.40 | 46 | KBS 24-2014 | 24.50 |
| 19 | JS 20-94 | 4.10 | 47 | JS 20-116 | 17.00 |
| 20 | NRC 117 | 6.50 | 48 | AMS1001 | 18.50 |
| 21 | AMS 115 | 7.50 | 49 | NRC 123 | 19.50 |
| 22 | KDS 975 | 8.10 | 50 | SL 1074 | 24.50 |
| 23 | VLS 91 | 7.60 | 51 | NRC 120 | 30.00 |
| 24 | NRC 119 | 6.60 | 52 | TS 69 | 23.50 |
| 25 | DSb 29 | 4.90 | 53 | BAUS 72 | 22.50 |
| 26 | PS 1570 | 3.90 | 54 | MACS 1488 | 25.00 |
| 27 | DS 3104 | 4.80 | 55 | VLB 202 | 21.50 |
| 28 | MAUS 710 | 4.90 | 56 | NRC 121 | 25.00 |

**Table.2** Evaluation of soybean entries against myrothecium leaf spot under field conditions

| Infection % | Disease reaction | Number of entries | Name of entries |
|---|---|---|---|
| 0 | Absolutely resistant | 0 | |
| 0.01-11.11 | Highly Resistant | 37 | JS 75-46, JS 72-280, PK 262, PK 472, MACS 58, JS 93-05, Punjab1, Bragg, Monetta, KHSB 2, NRC 7, VLS 58, Shivalik, PS 1569, RVS 2010-1,DSb 30-2, RSC 10-13, MACS 1491, JS 20-94, NRC 117, AMS 115, KDS 975, VLS 91, MAUS 710, TS 72, DS 3103, NRC 118, PS 1572, MACS 1480, AMS 100-1, Himso 1686, KDS 775, VLS 90, NRC 119, DSb 29, PS 1570, DS 3104, |
| 11.12-33.33 | Moderately resistant | 16 | SL 1074, NRC 120, TS 69, BAUS 72, MACS 1488, VLB 202, NRC 121, JS 335 KDS 754, RVS 2010-2, RSC 10-29, MAUS 740, KBS 24-2014, JS 20-116, AMS1001, NRC 123 |
| 33.34-55.55 | Moderately Susceptible | 3 | JS 72-44, JS 71-05, NRS 122 |
| 55.56.-77.77 | Susceptible | 0 | |
| 77.78-100 | Highly Susceptible | 0 | |

Location severity index (LSI) = 1.92

Present finding are in accordance with Singh and Srivastava (1994) who reported only two of the 26 cultivars as resistant for three consecutive years (1984-86), three were moderately resistant and the rest were moderately to highly susceptible against Myrothecium leaf spot disease. Srivastava *et al.,* (1994) recorded JS 81-303, JS 81-1619 and JS 81-335 as highly resistant varieties against *Myrothecium* leaf spot of soybean. Talukdar (2011) reported maximum varieties exhibited highly resistant reaction like PK-472 for the disease of Myrothecium leaf spot of soyabean.

In conclusion, the present study in evaluation of soybean entries/varieties against myrothecium leaf spot under field conditions reported that out of 56 entries /varieties, 37 entries /varieties, showed highly resistance reaction, 16 entries /varieties, were found moderately resistant and 3 were found moderately susceptible and effective in reducing the disease severity under field conditions.

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