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## Screening of soybean genotypes against *Colletotrichum truncatum*

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### Abstract

Soybean (*Glycine max* (L.) Merrill) is one of the most important oilseed-cum leguminous crop gaining importance during recent years due to its short duration, drought resistance, high yielding ability and nutritive value. It is the world's foremost provider of protein and oil. In Maharashtra, the area production and productivity of soybean were 39.76 lakh hectare, 46.16 lakh metric tonnes and 808 kg/ha, respectively (Anonymous, 2016). Soybean growing major states in the country are Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh, etc. Among the fungal diseases infecting soybean crop, anthracnose/pod blight caused by *Colletotrichum truncatum* is one of the most important and destructive disease.

**Keywords:** Soybean, Genotypes, *Colletotrichum*

### Introduction

Soybean plant health is a critical component of profitable soybean production. *Colletotrichum truncatum*, is the most common species recorded on soybean (Lenne, 1992) and the crop soybean is susceptible to *C. truncatum* at all stages of development particularly from bloom to pod fill.

### Material and Methods

Forty soybean genotypes obtained from soybean Research station, VNMKV, Parbhani were screened against *C. truncatum* under screen house condition and under field condition. To carry out the screen work, under screen house condition, 80 earthen pots were taken and five seeds of each cultivar were sown in each pot. Later two seedlings per pot were maintained for screening purpose and seedlings were inoculated with the spore suspension ( $10^5$  condition) after 20 days of sowing. After inoculation the plants were watered regularly and covered with polythene bags during evening hours to create high humidity. Observations were recorded on tenth days after inoculation by applying 0 to 9 scale given by Mayee and Datar (1986). Accordingly, the genotypes were grouped as immune, resistant moderately resistant, moderately susceptible, susceptible and high susceptible.

To carry out the screening work under field condition, each test entry was planted into two rows of 30 cm row to row and 5 cm plant to plant spacing. The experiment was non replicated. The observation on percent pod infection (PPI) were recorded at 15 days before harvesting of the crop and test entries of soybean were graded and categorized as : immune (0% PI), highly resistant (L 1% PI), resistant (2-5 % PI), moderately resistant (6-25 PI), susceptible (25-50% PI) and highly susceptible (>75% PI).

### Results and Discussion

Results of Table No. 1 revealed at under artificial epiphyotics and controlled conditions of the screen house, all the 40 soybean entries exhibited different reactions against, *C. truncatum*. Sixteen test entries viz., MACS-1201, VLS-76, JS-9752, MACS-1336, MAUS-2, PS-1477, SL-794, MACS-1140, MAUS-158, VLS-75, PS-1476, BAUS-40, Dsb-20, MACS-1311, MAUS-71 and SL-871 were found moderately resistant with mean percent disease intensity in the range of 12.20 to 23.10 per cent. However, five test entries viz., NRC-86, PS-1466, DS-27-11, DS-12-13, NRC-85 found moderately susceptible with mean per cent disease intensity in the range of 26.70 to 29.10 per cent. Fifteen test entries viz., Dsb-18, SL-799, KBS-8, RKS-63, MACS-1039, KS-103, KDS-344, AMS-243, CSB-08-08, JS (SH)-2003-8, MAUS-449, JS-20-29, MAUS-453, AMS-MB-5-19 and JS-93-05 were found susceptible with mean per cent disease intensity in the range of 51.20 to 54.25 per cent and four test entries viz., SL-778, Bragg, AMS-MB-5-18, and JS-335 were found highly susceptible with per cent disease

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intensity in the range of 75.14 to 77.70 per cent. None was found highly resistant or immune to the disease.

Further the results of Table No. 2 indicated that, of the 40 cultivars/varieties, genotypes, germplasm lines screened, none of the genotypes was found immune or highly resistant to the disease. However, sixteen genotypes *viz.*, MACS-1201, VLS-76, JS-9752, MACS-1336, MAUS-2, PS-1477, SL-794, MACS-1140, SL-871, MAUS-158, VLS-75, PS-1476, BAUS-40, Dsb-20, MACS-1311 and MAUS-71 were found moderately resistant (6-25% PI). Twenty one genotypes *viz.*, Dsb-18, NRC-86, PS-1466, SL-799, KBS-8, RKS-63, MACS-1039, KS-103, KDS-344, AMS-243, CSB-08-08, JS (SH)-2003-8, MAUS-449, JS-20-29, MAUS-453, AMS-MB-5-19, JS-93-05, DS-27-11, NRC-85, DS-12-13 and JS-335 were

found susceptible (26-50% PI) and three genotypes SL-778, Bragg, AMS-MB-5-18 were found highly susceptible (>51% PI).

These results obtained on screening of soybean varieties, genotypes against anthracnose disease are somewhat in similarity to those reported earlier by several workers (Verma and Upadhyay, 1973; Bowers, 1984; Rahman and Fakira, 1985; Amusa *et al.*, 1994; Singh, 1993; Khati *et al.*, 2007).

Thus soybean genotypes, germplasm line, varieties found moderately resistant against anthracnose/pod blight could further be exploited either for breeding disease resistant varieties of soybean or encouraged for the commercial cultivation on large scale.

**Table 1:** Reactions of soybean genotypes, germplasm lines, cultivars and varieties against *C. truncatum* under screen house conditions (Kharif 2012)

Name of cultivars	Mean PDI (%)	Varietal Reaction	Name of cultivars	Mean PDI (%)	Varietal Reaction
SL-778	75.14	HS	SL-871	21.22	MR
MACS-1201	16.20	MR	KS-103	52.70	S
VLS-76	19.10	MR	KDS-344	52.10	S
JS-9752	12.25	MR	MAUS-158	24.17	MR
Dsb-18	52.70	S	VLS-75	20.25	MR
NRC-86	28.50	MS	AMS-243	52.10	S
PS-1466	27.80	MS	CSB-08-08	52.15	S
MACS-1336	17.10	MR	JS(SH)-2003-8	51.90	S
SL-799	54.10	S	PS-1476	22.70	MR
Bragg	75.80	HS	DS-12-13	29.10	MS
KBS-8	51.70	S	BAUS-40	19.20	MR
AMS-MB-5-18	75.85	HS	Dsb-20	23.10	MR
MAUS-2	12.20	MR	NRC-85	28.70	MS
PS-1477	21.20	MR	MAUS-449	51.60	S
SL-794	20.80	MR	MACS-1311	18.10	MR
JS-335	77.70	HS	JS-20-29	52.32	S
RKS-63	51.80	S	MAUS-453	51.20	S
DS-27-11	26.70	MS	AMS-MB-5-19	52.20	S
MACS-1039	52.20	S	JS-93-05	54.25	S
MACS-1140	18.25	MR	MAUS-71	22.10	MR

**HS:** Highly susceptible; **S:** Susceptible

**MR:** Moderately resistant **MS:** Moderately susceptible

**Table 2:** Reactions of soybean genotypes, germplasm lines, cultivars varieties against *C. truncatum* under field conditions (Kharif 2012)

Sr.No.	Reactions	PPI	Genotypes
1	Immune	0	None
2	Highly Resistant	<1	None
3	Resistant	(2-5%)	None
4	Moderately Resistant	(6-25%)	MACS-1201, VLS-76, JS-9752, MACS-1336, MAUS-2, PS-1477, SL-794, MACS-1140, SL-871, MAUS-158, VLS-75, PS-1476, BAUS-40, Dsb-20, MACS-1311, MAUS-71
5	Susceptible	(26-50%)	Dsb-18, NRC-86, PS-1466, SL-799, KBS-8, RKS-63, MACS-1039, KS-103, KDS-344, AMS-243, CSB-08-08, JS(SH)-2003-8, MAUS-449, JS-20-29, MAUS-453, AMS-MB-5-19, JS-93-05, JS-335, DS-27-11, NRC-85, DS-12-13
6	Highly Susceptible	>51%	SL-778, Bragg, AMS-MB-5-18

\* PPI-Per cent pod infection

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