Present Status of stem rot disease (*Sclerotinia sclerotiorum*) of mustard (*Brassica juncea*) in Rajasthan, India

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ABSTRACT

Stem rot of mustard, incited by *Sclerotinia sclerotiorum* has become an important problem in several mustard growing areas of Rajasthan. Four hundred and eighty three fields of mustard in 19 districts were surveyed in the year 2001 and 2002 to detect the incidence of stem rot. Disease incidence varied from 1.0 to 60 per cent and in fields where disease incidence was 60 per cent, 30-40 per cent seed yield loss was recorded. Higher incidence of disease was favoured by certain factors like 4-6 irrigations, clay type soil, dense plant population, susceptible variety and continuous cultivation of mustard in that area. It was observed that the mustard varieties grown by the cultivators (BIO-902, Pusa Bold, Varuna and RH-30) were susceptible to stem rot disease. Mustard crop sown in 2nd and 3rd week of October was found to be more prone to the disease then crop sown between 4th week of October and 1st week of November. In all 27 isolates of *Sclerotinia* were collected from infected plants. These isolates were classified into 9 groups on the basis of cultural characters.

Key words : *Sclerotinia sclerotiorum*, Indian mustard, survey, isolates.

Indian mustard [*Brassica juncea* (L.) Czern & Coss.] is one of the major oil seed crops cultivated in India. Stem rot disease appears at different growth stages of plants resulting in heavy seed yield loss. Chauhan *et al.* (1992) reported that stem rot of mustard caused yield losses of upto 72 per cent in severe cases in Uttar Pradesh.

Materials and Methods

Four hundred and eighty three mustard fields in major mustard growing areas of Rajasthan were surveyed in February 2001 and 2002 at pod formation/pod maturity stage of the crop. An area of 1 m × 1 m was marked at five randomly selected spots on each farmer's field and per cent incidence of stem rot was calculated. In all 27 isolates of *Sclerotinia* were collected from infected plants. The morphological characters of each isolate such as growth pattern, colony diameter, number and size of sclerotia, position of sclerotia in colony were recorded upto 15 days at regular intervals.

Results and Discussion

Out of 483 mustard fields surveyed in 19 districts of Rajasthan, maximum disease incidence i.e. 40-60% was recorded in 26 fields of 9 districts. In 68 fields 20-40% incidence of stem rot was recorded and in rest of the fields it was less than 20%. Data in Table 1 reveals that the mustard crop sown between last week of October and first week of November had

minimum stem rot incidence of 2.85 percent while incidence was significantly higher (28.66%) in sowing done in second to third week of October. Sharma *et al.* (2001) worked on stem rot of mustard in Haryana reported the same trend. This may be due to the fact that in late sowing, the post flowering stage reaches by January end which does not coincide with the congenial period. All cultivars grown by farmers were found susceptible to stem rot, disease incidence ranging from 9.88% in local cultivars to 21.93% on cultivar T-59 (Varuna).

Table 1 : Effect of various agronomic practices on the incidence of stem rot of Indian mustard caused by *Sclerotinia sclerotiorum*

	Agronomic practices	No.of* fields	Disease incidence (%)	ϕ Value
A.	**Date of Sowing :**			
1.	Last week of Sept. - 1st week of Oct.	19	13.88	(21.87)**
2.	2nd week of Oct. - 3rd week of Oct.	19	28.66	(32.34)
3.	4th week of Oct. - 1st week of Nov.	19	2.85	(9.67)
	CD (p = 0.05)			(8.47)
B.	**Varieties :**			
1.	T-59 (Varuna)	12	21.93	(27.93)
2.	Bio-902	12	15.58	(23.24)
3.	RH-30	12	12.85	(21.01)
4.	Pusa Bold	12	10.51	(18.92)
5.	Seva	12	15.10	(22.86)
6.	Local	12	9.88	(18.31)
	CD (p = 0.05)			NS
C.	**Rotations**			
1.	Fallow-mustard-fallow-mustard	16	17.20	(24.51)
2.	Pearl millet-mustard-pearl millet- mustard	16	21.20	(27.40)
3.	Soybean-coriander-cucurbits-mustard	16	20.42	(26.87)
4.	Pearl millet - mustard - pulses - mustard	16	12.19	(20.41)
5.	Pearl millet - wheat - fallow - mustard	16	1.80	(7.63)
	CD (p = 0.05)			(10.13)
D.	**Irrigations :**			
1.	One irrigation	13	4.50	(12.23)
2.	Two irrigation	13	9.40	(17.85)
3.	Three irrigation	13	22.45	(28.27)
4.	Four irrigation	13	24.00	(29.28)
5.	Un-irrigated	13	0.63	(4.53)
	CD (p = 0.05)			(9.28)
E.	**Soil Texture**			
1.	Clay soil	14	14.01	(21.98)
2.	Clay loam soil	14	18.06	(25.16)
3.	Loamy soil	14	24.00	(29.33)
4.	Sandy loam soil	14	9.01	(17.47)
5.	Sandy soil	14	5.58	(13.64)
	CD (p = 0.05)			(9.94)

*Average of number of fields. ** Angular values.

During survey of mustard growing fields, it was observed that crop rotation plays an important role in reducing disease incidence. Minimum stem rot incidence (1.80%) was recorded in pearl millet - wheat - fallow - mustard rotation followed by Pearl millet - mustard - pulses - mustard rotation (12.19%). Similarly a striking correlation was found between disease incidence and number of irrigations given. The disease incidence was significantly high (22.45 and 24%) in fields given three and four irrigations at an interval of 30-35 days. Another factor studied was the correlation of disease incidence with the type of soil. Maximum disease incidence was found in loamy soil (24.00%) followed by clay loam (18.06%), clayey (14.01%) and sandy loam (9.01%) soils while minimum incidence (5.58%) was found in sandy soil.

Twenty seven isolates of *Sclerotinia* were collected from infected plants. These isolates were classified into 9 groups on the basis of colony character, colour, size and number of sclerotia and their location in the colony. These nine groups of isolates will be tested on seven host differentials to record the pathogenic variability. Dhawan *et al.* (1981) isolated 4 isolates of *S. sclerotiorum* from chinese mustard which were markedly different in their virulence.

It may be concluded that minimum disease incidence was observed where sowing was done in the last week of October, wherein 2-3 irrigations were provided, the soil was sandy, pearl millet - wheat - fallow - mustard crop rotation was followed.

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