

Evaluation of fungitoxicants against alternaria blight and white rust diseases of Indian mustard (*Brassica juncea*)

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The production of rapeseed-mustard group of crops, which was hovering around 2.68 million tonnes with a productivity level of 650 kg/ha until 1985-86 increased to 6.94 million tonnes in 1996-97 with productivity increase to 1001 kg/ha. Yet it is far below than world average of 1333 kg/ha. Considerable potential exists for improving both production and productivity of oilseed brassicas through breeding improved varieties resistant to diseases and management of diseases. Among diseases, alternaria blight [*Alternaria brassicae* (Berk.) Sacc.] and white rust [*Albugo candida* (Pers. ex Lev.) Kuntze] are most damaging diseases and prevalent in almost all mustard-growing localities throughout the world causing substantial losses.

The yield losses due to infection of *Albugo candida* on leaf and staghead phase occurs up to 27.4 and 62.17 % respectively in isolation and 89.8 % in combination (Lakhra and Saharan 1989) in *Brassica juncea*. Heavy infections of *Alternaria brassicae* and *A. brassicola* (Schwein) Wiltshire on leaves, stems and siliquae reduce the yield considerably and also the oil content in affected seeds. Verma and Saharan (1994) reported yield losses ranging from 10 to 75% in oilseed brassicas in India. To control these diseases, so far only Mancozeb and Copper oxychloride fungicides have been reported against both the diseases and still the demand for fungicides, superior in control, always exist in mustard-growing areas.

Hence a study was undertaken to evaluate the new fungicides against both the diseases in an integrated manner.

Six fungitoxicants, viz. Mancozeb 0.2% (Manganese ethylene-1,2-bis-di-thio carbamate), Ridomil MZ 0.25% (Metalaxyl, 8% i.e. Methyl DL-N-(2,6-di methyl phenyl)-N-(2, methoxy acetyl) alaninate + Mancozeb, 64%), Captan 0.2% (N-tri-chloro methyl thio-4-cyclohexene-1,2 dicarboxymide), Rovral 0.2% (Iprodione), Bayletan 0.05% (1-(4-chloro phenoxy)-3,3-di methyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone) and copper oxychloride (CuOCl₂) were evaluated against alternaria blight and white rust diseases.

Unsprayed check served as the control. The sprays of Ridomil scap and Rovral were done only 60 and 80 days after sowing, whereas other fungicides at 60, 80 and 100 days after sowing. The experiment was conducted in randomized block design with a plot size of 5 m × 3 m. The variety 'Varuna' was used in the experiment. The observation on disease intensity (%) of both the diseases at leaf and pod infection stages were recorded on 0-5 scale (0, 1-10%; 2, 11-25%; 3, 26-50%; 4, 51-75%; 5, 75-100%).

All the fungicides were found significantly superior in controlling both the diseases, though efficacy of chemicals was highly variable.

Rovral (0.2%) was found to be the best against alternaria blight disease. Mean disease intensity on leaf and pod was 8.75 and 5.6% respectively compared with the control, where it was 28.7 and 24.3% respectively. Among other fungicides, Bayletan followed by Mancozeb and Copper oxychloride also showed good promise against the disease (Table 1). The highest yield level was obtained in Rovral, followed by Ridomil MZ and Mancozeb which were superior to that of control (Table 1).

Among all the fungicides, Ridomil MZ excelled in the control of white rust disease. Mean disease intensity and staghead were only 8.7 and 0.5 % respectively compared with the control where it was 30.5 and 7.2 % respectively. Next in order were Bayletan (0.05%) and Mancozeb (0.2%) (Table 1).

The seed yield was 1.91 tonnes/ha with Ridomil MZ treatment which was closely comparable with highest yield obtained with Rovral (2.09 tonnes/ha.). However, the yield levels were significantly higher than control where it was only 1.57 tonnes/ha.

It was concluded that Rovral (0.2%) was very effective in controlling alternaria blight disease and increasing seed yield. The fungicides Rovral (0.2%) was reported best against the disease in annual progress report of Co-ordinated Research Project on Rapeseed and Mustard (AICRP-RM 1994, 1998). Ridomil MZ (0.25%) was best against white rust disease. Dueck and Stone (1979) also reported Metalaxyl or Ridomil MZ, best for the control of *Albugo candida* in turnip rape.

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Table 1 Evaluation of fungitoxicants against alternaria blight and white rust diseases of Indian mustard during 1995-97

Chemical	Dose Alternaria blight (PDI)										Yield (tonnes/ha)								White rust (PDI)					
	(%)	1995		1996		1997		Mean		P	1995		1996		1997		Mean		SH	L	Mean	SH	L	Mean
		L	P	L	P	L	P	L	P		L	P	L	P	L	P	L	P						
Mancozeb	0.2	15.6	12.5	16.3	14.0	8.0	13.3	13.3	10.7	2.3	13.8	4.1	*	*	*	12.3	3.2	2.04	1.98	1.70	1.9			
Ridomil MZ	0.25	19.3	15.3	18.2	15.7	11.4	16.3	15.5	7.2	0.5	10.2	0.5				8.7	0.5	2.07	1.92	1.61	1.9			
Captan	0.2	23.9	17.5	26.5	21.7	13.7	21.3	19.6	14.3	4.7	19.3	6.2				16.8	5.5	1.91	1.78	1.54	1.7			
Roveral	0.2	7.5	4.9	10.0	6.3		8.8	5.6	16.6	4.3	21.0	3.5				18.8	3.9	2.12	2.07		2.1			
Bayletan	0.05	12.2	8.6	13.8	9.3	7.6	11.2	8.95	9.6	2.1	15.1	3.0				12.4	2.6	2.09	1.81	1.74	1.9			
Copper oxy-chloride	0.3	14.8	13.2	15.7	13.5	9.9	13.5	13.4	13.4	3.5	16.3	4.1				14.9	3.8	1.99	1.81	1.66	1.8			
Control		31.0	20.3	33.3	28.4	22.3	28.7	24.4	26.3	6.2	34.7	8.2				30.5	7.2	1.73	1.57	1.44	1.6			
SEM ±		2.02	1.31	2.31	1.82	0.65	1.04	1.1	1.92	0.38	2.02	0.7				0.96	0.4	0.02	0.05	0.07	0.03			
CD (P=0.05)	6.2	4.05	7.11	5.6	2.03		3.09	3.2	5.94	1.2	6.22	2.1				2.7	1.1	0.06	0.15	0.20	0.08			

*Disease incidence was very low; L, Leaf; P, pod; SH %, per cent staghead; PDI, Per cent disease intensity

SUMMARY

An experiment was conducted during 1994-95 to 1996-97 to evaluate fungitoxicants against alternaria blight and white rust diseases of Indian mustard [*Brassica juncea* (L.) Czernj. & Cosson]. RidomilMZ, Mancozeb, Bayletan, Captan, Roveral and Copper oxychloride were tried as foliar spray. All the fungicides were significantly controlled both the diseases, though their efficacy varied. Roveral 0.2% was very effective in checking alternaria blight and increasing yield. RidomilMZ (0.25%) excelled others in controlling white rust.

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