chambers. Disease severity was recorded 15 days after inoculation using 1-9 rating scale.

Among 116 genotypes, 5 *viz.*, BM 4, CO 4, CO 5, ML 515 and TM 98-50 exhibited resistant while 8 *viz.*, AAU 34, LM 319, LM 729, SG 1, TM 98-37, TM 99-50, V 461 and VC 3944 moderately resistant reaction. Sixteen genotypes were found moderately susceptible. Remaining genotypes exhibited susceptible or highly susceptible reaction to the disease. Singh and Gurha (2007) screened 91 genotypes against powdery mildew, only 2 found resistant. Testing for resistance under artificial epiphytotic conditions confirmed the stable resistance in the genotypes found resistant/ moderately resistant during 2003 (Table 1). The genotypes possessing stable resistant reaction could be utilized in resistance breeding programmes.

Reference

Singh, R.A. and S.N. Gurha (2007). Resistance to powdery mildew in urd bean and mung bean genotypes. *Ann. Pl. Protec. Sci.*, **15** : 268-270.

Efficacy of Fungicides against *Phyllosticta* Leaf Spot of Mung bean

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Mung bean (*Vigna radiata*) is cultivated in India as an important pulse crop during *kharif* and summer seasons. The crop is attacked by leaf spot caused by *Phyllosticta phaseolina*. being major one. Present study was undertaken to test efficacy of fungicides against this disease *in vitro* and under field conditions.

Ten fungicides each at three concentrations (Table 1), were evaluated in the laboratory by assessing mycelial growth inhibition through poison food technique. The dia. of the growth of the fungus on fungicide impregnated medium in comparison to the growth on PDA without fungicide was recorded. Each treatment had three replications. The inoculated plates were incubated for 7 days at 25-28^{0}C and radial growth of the fungal colonies was measured and inhibition % of the fungus was also calculated. Field trial was laid in R.B.D. with 2.0 x 2.0 m sub plot using susceptible Cv. SKUA-M-86 of mung bean, replicated thrice. Treatments included sprayings of the fungicides at the doses mentioned in Table 2. The first spray was done after appearance of symptoms and subsequent two sprays at 10 days intervals. Observations were taken on disease severity, disease incidence and grain yield. Disease severity was recorded on the basis of % leaf area affected and disease incidence was calculated on the basis of % plants infected.

Hexaconazole (400 & 300 ppm) and diniconazole (400 & 300 ppm) completely inhibited the growth of the fungus *in vitro* and were found as the most effective fungicides (Table 1). These were followed by hexaconazole and diniconazole at 200 ppm, which differed significantly Amongst the partially effective fungicides, ziram (1000 ppm) caused the lowest inhibition of growth.

All the 10 fungicides tested under field conditions reduced the disease severity, disease incidence and gave better grain yield as compared to control (Table 2). Minimum disease severity, disease incidence and highest grain yield were

Table 1. Inhibitory effect of fungicides on the mycelial growth of *Phyllosticta phaseolina in vitro*

Treatments	Concentration (ppm)	Avg. dia. of fungal colony (mm)		% Inhibition over Control
Hexaconazole	400	0.0	(1.00)*	100.0
	300	0.0	(1.00)	100.0
	200	3.5	(2.12)	94.2
Diniconazole	400	0.0	(1.00)	100.0
	300	0.0	(1.00)	100.0
	200	4.5	(2.34)	92.5
Copper oxychloride	3000	21.5	(4.74)	64.4
	2000	27.0	(5.29)	55.3
	1000	45.5	(6.81)	24.7
Carbendazim	600	20.0	(4.58)	66.9
	500	28.5	(5.43)	52.8
	400	44.5	(6.74)	26.4
Dodine	700	24.5	(5.05)	59.5
	600	29.0	(5.48)	51.2
	500	36.5	(6.09)	39.6
Propineb	4000	23.0	(4.89)	61.9
	3000	32.5	(5.79)	46.2
	2000	41.5	(6.52)	31.4
Zineb	3000	26.5	(5.24)	56.2
	2000	35.5	(6.04)	41.3
	1000	48.0	(6.98)	20.6
Mancozeb	4000	25.0	(5.10)	58.6
	3000	37.5	(6.20)	30.0
	2000	47.5	(6.96)	21.4
Captan	4000	24.0	(5.00)	60.3
	3000	39.5	(6.36)	34.7
	2000	48.0	(7.00)	20.6
Ziram	3000	30.5	(5.61)	49.5
	2000	45.0	(6.78)	25.6
	1000	52.5	(7.31)	13.2
Control		80.5	(7.84)	-
S.E.M.			(0.52)	
CD			(1.03)	

* Figures in parenthesis are square root transformed values.

recorded in case of hexaconazole, followed by diniconazole. Copper oxychloride and carbendazim were on par with each other in case of disease severity. Singh and Singh (2006) also reported the efficacy of hexaconazole against fungal plant diseases. Further, Singh and Singh (2007) observed higher yield of sarson by use of fungicides.

Table 2. Effect of fungicidal sprays against *Phyllosticta* leaf spot of mung bean (mean of 2 years)

Treatment (%)	Avg. disease severity (%)	Avg. disease incidence (%)	Avg. grain yield (kg/ha)
Hexaconazole (0.03)	8.44 (16.88)*	24.47 (29.63)	612.85
Diniconazole (0.03)	9.76 (18.20)	28.02 (31.95)	592.76
Copper oxychloride (0.25)	13.29 (21.37)	34.54 (35.98)	518.91
Carbendazim (0.05)	14.20 (22.13)	37.67 (37.86)	473.72
Dodine (0.06)	14.93 (22.73)	39.07 (38.67)	457.84
Propineb (0.3)	15.97 (23.55)	40.67 (39.61)	441.12
Indofil Z-78 (0.2)	18.42 (25.41)	41.94 (40.36)	429.57
Indofil M-45 (0.2)	19.17 (25.96)	45.07 (42.17)	412.80
Captan (0.3)	20.14 (26.67)	48.50 (44.14)	386.75
Ziram (0.2)	27.71 (31.76)	51.86 (46.07)	367.17
Control	36.97 (37.45)	61.13 (51.44)	321.45
S.Em. ±	(0.46)	(1.10)	2.31
CD (P=0.05)	(0.95)	(2.30)	4.83

* Figures were angular transformed for analysis

References

Singh, P. C. and D. Singh (2006). *In vitro* evaluation of fungicides against *Alternaria alternata*. *Ann. Pl. Protec. Sci.*, **14** : 500-502.

Singh, Ramesh and V.K. Singh (2007). Evaluation of fungicides against Alternaria blight of *Brassica compestris* var. yellow sarson. *Ann. Pl. Protec. Sci.*, **15** : 266-267.