

Management of alternaria blight of pigeonpea crop through chemicals

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SUMMARY

Pigeonpea, [*Cajanus cajan* (L.) Millsp.] is an important grain legume in India. Pigeonpea infected by *Alternaria tenuissima* caused leaf blight having low production. The chemical control of the disease in order to minimize the losses by the method of spraying in pot and field condition. In spraying of fungicides, Indofil (Dithane) M-45 was observed to be the most effective in controlling the disease in pot condition as well as in field evaluation, followed by Difolatan and Chlothanolil. These fungicides were also effective in increasing the yield/hac. in comparison to other fungicides and control.

Pigeonpea is the second most important pulse crop after chickpea in India. It contains about 22.3 per cent protein with good amount of essential amino acids like lysine, cystine and arginine etc. It is necessary to improve the average production of this crop because in comparison to many other countries of the world, its production is low. Now day by day the price of pigeonpea grain is increasing and production and areas are decreasing.

MATERIALS AND METHODS

Studies were carried out for the management of the disease by spraying of chemicals which were found effective in the bioassay test, using highly susceptible pigeonpea variety (Bahar). The plants were raised in 30 cm pots and five plants per pot were maintained and replicated three times. After attaining the age of one month, the plants were inoculated with spore cum - mycelial suspension of the pathogen. Spraying of fungicides was done 48 hours after inoculation and repeated at an interval of ten days with two subsequent sprays. The potted plants sprayed with water served as control. Observations on disease intensity were recorded on the basis of percentage of leaf area affected after 10 days of the last spray.

The fungicides found effective against the pathogen *in vitro* were tested in field during Kharif season 1998 and 1999 for the control of the disease. The experiment was conducted

in a Randomized Block Design with three replications in a plot size 4 x 3 m. A highly susceptible variety, Bahar was sown in spacing between the rows and the plants 60 and 20 cm, respectively. Sixty days old plants were artificially inoculated by spraying spore-cum-mycelial suspension of the pathogen and the plots were irrigated from time to time to maintain proper moisture. The first spraying of the fungicides in recommended doses was given 48 hrs after inoculation, followed by two applications at an interval of 15 days. The control plots were sprayed with water only.

Final observations on disease intensity were recorded 15 days after the last spray on the basis of percentage leaf area affected. Dry pods per plot were recorded after harvest of the crop. Finally grain yield per hectare was also calculated.

RESULTS AND DISCUSSION

The relative efficacy of nine spray fungicides which were found effective or partially effective in bioassay test was evaluated in pot experiments. Amongst them, Indofil (Dithane) M-45 resulted in best control of disease followed by Difolatan and chlorothanlonil. Vishwakarma (1989) observed that the relative efficacy of fungicides for the control of early blight on tomato caused by *Alternaria solani*. Nine various spray fungicides were found effective or partially effective in bioassay test, were also tested in

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Table 1 : Effect of different spray fungicides on the severity of Alternaria leaf blight of pigeonpea in pot culture experiment

Sr. No.	Fungicides	Dose (%)	Average intensity	Disease (%)	Per cent disease control
1.	Indofil (Dithane) M-45	0.2	12.27	20.50	75.14
2.	Difolatan	0.2	14.57	22.43	70.48
3.	SAN 619 F	0.2	16.40	23.87	66.78
4.	Chlorothanlonil	0.2	16.63	24.06	66.31
5.	Ridomil	0.2	21.27	27.31	57.32
6.	Indofil (Dithane) Z-78	0.2	22.53	28.33	54.36
7.	Copper oxychloride	0.2	25.20	30.16	48.95
8.	JKstein	0.1	29.37	32.82	40.51
9.	Panolil	0.15	30.30	33.39	38.62
10.	Control	-	49.37	44.64	-
	C.D. (P=0.05)		0.726	1.51	

Note : Figures in parenthesis indicated angular transformed values

Table 2 : Effect of fungicides in controlling Alternaria leaf blight of pigeonpea caused by A. tnuissima and grain yield in the field

Sr. No.	Fungicides	Dose (%)	Disease intensity				Average yield (g/ha)	
			1998-99		1999-2000		1998-99	1999-2000
			Average disease intensity	Disease control (%)	Average disease intensity	Disease control (%)		
1.	Indofil (Dithane) M-45	0.2	13.40 (20.50)	86.60	9.57 (12.67)	80.15	14.51	18.00
2.	Difolatan	0.2	16.60 (24.03)	66.57	13.50 (11.75)	72.00	13.75	21.55
3.	Chlorothanlonil	0.2	19.50 (26.20)	60.74	15.77 (11.30)	67.30	13.15	23.39
4.	SAN 619F	0.2	20.47 (26.89)	58.78	16.77 (11.05)	65.22	13.00	24.16
5.	Ridomil	0.2	24.13 (29.42)	51.41	20.47 (10.62)	57.55	12.85	26.89
6.	Indofil (Dithane) Z-18	0.2	26.87 (31.21)	45.90	25.47 (10.50)	47.19	12.65	30.30
7.	Copper oxychloride	0.2	29.27 (32.74)	41.07	25.50 (10.25)	47.12	11.75	30.32
8.	Jkstein	0.1	33.63 (35.44)	32.29	28.60 (9.80)	40.70	10.65	32.32
9.	Panolil	0.15	35.70 (36.67)	28.12	29.53 (9.40)	38.77	10.15	32.91
10.	Control	-	49.67 (44.80)	-	48.23 (8.69)	-	9.65	43.98
	C.D. (P=0.05)		1.60		1.23		1.57	1.74

Note : Figures in parenthesis indicated angular transformed values

the field condition to manage the disease during 1999-2000 and 2000-2001. It was recorded that the excellent result was obtained by spraying of Indofil (Dithane) M-45 followed by Difolatan, Chlorothanlonil and San 619F.

The next fungicides in order of superiority were Ridomil, Indofil 2-78, Copper oxychloride, Jkstein and Panolil. Amongst these chemicals, only the application of Indofil M-45 and Difolatan gave the better performance in the sense of production of grain, over the control in both the years. Kolte *et al.* (1979) observed the efficacy of certain chemicals on yellow sarson and field performance of fungicides in the control of Alternaria blight on sunflower. It was also observed that the performance of non-systematic fungicides was better in controlling the disease in comparison to systematic fungicides. Patel *et al.* (1985) evaluated that efficacy of

certain systematic and non systematic fungicides in control of Alternaria leaf spot of cotton. Dharamvir (1972) and Sankhala *et al.* (1972) evaluated the efficacy of fungicides against Alternaria blight of wheat. There is no earlier work regarding the control of this malady of spraying of fungicides. Spurr and Welty (1972) observed that the brown spot of tobacco caused by *Alternaria alternata* was effectively controlled by Difolatan. Narain (1978) also reported that the spray fungicides *viz.*, Difolatan and Dithane M-45 proved to be the best fungicides in controlling the leaf spot of sunflower caused by *Alternaria alternata*. Sinha and Prasad (1989) found that Difolatan was the best followed by Dithane M-45 in controlling the Alternaria blight of cauliflower seed crop. Fugro *et al.* (1995) observed that the fungicidal sprays of Dithane M-45 (0.25%) and chlorothanlonil (0.25%) reduced the

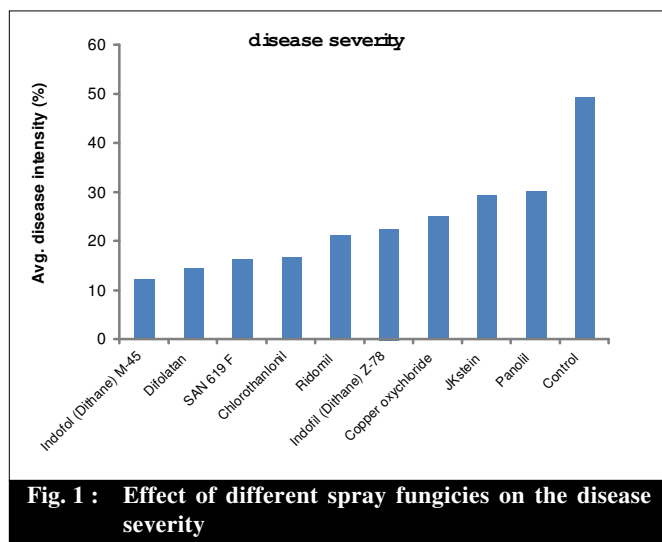


Fig. 1 : Effect of different spray fungicides on the disease severity

incidence of *Alternaria* blight of tomato by 20 per cent. Devanathan and Ramanujam (1995) reported that foliar spray of Mancozeb (0.2%) reduced the disease intensity and increased yield significantly as compared to unsprayed plot in case of early blight of tomato. Chlorothalonil (0.2%) and copper oxychloride (0.3%) were next effective fungicides.

From the findings it was recommended that Indofil (Dithane) M-45 can be sprayed at an interval of 10 days from the first appearance the disease symptoms to minimize the disease on economic level where it occurs in severe form (Narain, 1978; Patel *et al.*, 1985; Singh and Bhowmik, 1985).

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