Karnataka J. Agric Sci. 3 (3 & 4) : (200-202) 1990

Field Evaluation of Fungicides Against Powdery Mildew of Greengram

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(Received October, 1989)

ABSTRACT

The effect of six fungicides i. e., tridemorph (0.02%), carbendazim (0.05 and 0.1%), wettable sulphur (0.1 and 0.2%), mancozeb (0.2%) copper oxychloride (0.3%) and ziram (0.2%) on powdery mildew control was studied during June. 1988. Among six fungicides evaluated, tridemorph resulted in a reduction of the disease by 87.72 per cent. Carbendazim reduced the disease by 73 05 and 73.12 per cent at 0.5 and 0.1 per cent concentrations, respectively. Wettable sulphur (0.1 and 0.2%) reduced the disease by 61.91 per cent and 69.49 per cent, respectively. Mancozeb, ziram and copper oxychloride could reduce the disease by 58.11, 58.05 and 56.67 per cent, respectively.

Powdery mildew of green gram (*Vigna radiata* (L) Wilczek) caused by *Erysiphe polygoni* DC is one of the serious diseases of green gram, affecting grain yield (Legapsi *et al.* 1978). Gupta *et al.* (1975) and Raut *et al.*, (1986), reported the use of fungicides to control the powdery mildew of green gram satisfactorily. Hence, the effect of fungicides to control the disease was studied to know the cost-benefit ratio. The field trial was conducted at the University of Agricultural Sciences, Dharwad in *Kharif*, 1988.

MATERIAL AND METHODS

The trial was laid out in randomised Block Design with three replications, using Chinamung variety. Sowing was done in 3 m × 2.4 m plots with 30 cm × 10 cm spacing. Fertilizer dose of 20 N, 40 P and 20 K per hectare was applied basally. Insect control measures and agronomic practices were undertaken for good growth of the crop. The fungicides tested were tridemorph (2, 6-dimethyl 4-cyclodedocyl morpholine), carbendazim (Methyl 2-benzimidazole carbamate), wettable sulphur, mancozeb (Manganese ethylene bis-dithiocarbamate), copper oxychloride and ziram (zinc dimethyl dithiocarbamate) at 0.02, 0.05 and 0.1, 0.1 and 0.2, 0.2, 0.3 and 0.2 percent concentrations, respectively. The first spray was given after the appearance of the disease and was repeated twice at ten days interval. The final observations on disease severity were recorded ten days after third spray from five plants on six leaves each i.e., two

Table 1. Effect of Fungicides on control of powdery mildew of greengram and grain yield

Treatments	Mean PDI (Arcsin values)	Per cent reduction of disease over control	Yield (Q/ha)	Per cent increase in yield over control	Income (Rs./ha)	Total Qty. of fungicide (Kg/lit/ha)	Total cost of fungicides (Rs./ha)	Total cost of fungicides + wages (Rs /ha)	Net income (Rs./ha)	Cost benefit ratio
Tridemorph (0.02%)	7.00	87.72	7.93	178.24	4758	0.868	377.2	401.7	4386.3	1 : 7.2
Carbendazim (0. 1%)	15.32	73.12	8.55	200.00	5120	6.94	3123.0	3147.5	1982.5	1 : 0.05
Carbendazim (0.05%)	15.36	73.05	6.61	131.92	3966	3.47	1561.5	1586.0	2380.0	1 : 0.42
Wettable Sulphur (0. 2%)	17.39	69.49	6.09	113.68	3654	7.81	312.4	336.9	3317.1	1 : 4.77
Wettable Sulphur (0. 1%)	21.71	61.91	5.12	79.64	3072	4.34	173.6	198.1	2873.9	1 : 5.87
Mancozeb (0. 2%)	23.65	58.51	4.90	72.90	2940	9.23	775.32	799.8	2140.18	1 : 0.53
Ziram (0. 2%)	23.91	58.05	4.57	60.35	2742	25.69	1541.40	1565.9	1176.10	1 : -0.34
Copper oxychloride (0. 3%)	24.70	56.67	3.83	34.38	2088	20.83	1291.46	1315.9	772.04	1 : -7.1
Check	57.01	—	2.85	—	1710	—	—	—	1710.00	—
S. Em. ±	1.34		0.30							
C. D. at 5%	4.01		0.89							

Labour charges for spraying (Rs./ha) = 26.50

each from bottom, middle and tip portions using O-5 scale, where

O= no infection,
1 = less than one percent leaf area covered,
2 = 1-25 percent leaf area covered,
3 = 26-50 percent leaf area covered,
4 = 51-75 percent leaf area cevered,
5 = 76-100 percent leaf area covered,

The percent disease index was calculated according to Sivaprakasam *et al.* (1981).

RESULTS AND DISCUSSION

The data on effect of fungicides under field conditions are presented in Table 1. Tridemorph (0.02%) could significantly control the powdery mildew infection as compared to other fungicides. It showed only 7.0 percent disease index with reduction of the disease to the extent of 87.72 percent. Next best fungicide was carbendazim (0.05 and 0.1%) which recorded 15.36 and 15.32 per cent disease index resulting in reducing the disease by 73.05 per cent and 73.12 per cent, respectively over control. Wettable sulphur (0.2%) control was on par with carbendazim. Further, mancozeb (0.2%) and ziram (0.2%) were equally good in reducing disease index by 61.91, 58.51 and 58.05 percent, respectively over control. Copper oxychloride (0.3%) was least effective in controlling the disease having 24.70 percent disease index and 56.67 percent reduction over control.

Tridemorph gave highest (1 : 7.2) cost-benefit ratio followed by wettable sulphur (1 :5.8) at 0.1 percent concentration. Copper oxychloride gave lowest (1 : -7.1) cost-benefit ratio.

In the absence of the resistant cultivars, use of chemicals to control the disease is a practice. Among six fungicides, tridemorph gave best result. Maximum grain yield was obtained in carbendazim treated plot with 0.1 percent concentration, though it ranked second in controlling the disease which is in accordance with results of Gurha and Gangal (1980). Carbendazim appears to possess some stimulatory effect in addition to its fungicidal action (Nene & Thapliyal, 1987).

The authors are grateful to the University of Agricultural Sciences, Dharwad for providing the facilities. The first author is thankful to Indian Council of Agricultural Research for awarding Junior Fellowship.

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