

## FOLIAR SPRAY OF FUNGICIDES TO CONTROL ALTERNARIA BLIGHT OF RADISH SEED CROP

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### ABSTRACT

An investigation was conducted in controlling the *Alternaria* blight of radish seed crop (var. Rocki) during the cropping season of 2005-06 at Thakurgaon District. The fungicides viz. Iprodione (0.2%), Mancozeb (0.3%) and Carbendazim (0.1%) were sprayed twice from first disease initiation with 15-d interval. Among the fungicides, Iprodione (0.2%) was found the most effective. Two sprays of Iprodione significantly reduced the leaf area diseased by 76.01% and pod area diseased by 81.87% over control. The 1000-seed weight (g), yield per plant (g) and yield (t/ha) were obtained significantly higher over control by 23.5%, 59.2% and 48.9%, respectively.

**Keywords:** *Alternaria blight, Radish seed, Fungicides*

### INTRODUCTION

Radish (*Raphanus sativus* L.), the third most important vegetable crop of Bangladesh is attacked by a number of diseases (Talukdar 1974; Rashid 2000). Among them, *Alternaria* blight caused by *Alternaria brassicae* (Berk) Sacc and *Alternaria brassicicola* (Schw) Wiltshire is one of the major in this country (Anon. 1984; Mondal *et al.* 1989). The disease causes black spots on leaves, stems and pods resulting in the loss of both yield and quality of seed of radish. Incidence of *Alternaria* blight and its adverse effect on seed yield had been reported by Meenu and Hudal (2004). They reported 46.38% yield loss due to the disease. Many fungicides have been tested for effectiveness in controlling *Alternaria* disease and results indicated that fungicidal spray has significant effect in controlling this disease under field conditions (Suhag *et al.* 1983). In Bangladesh, a number of chemicals have been evaluated against *Alternaria brassicae* in radish with varying degree of success (Ayub *et al.*, 1996). But information on the control of *Alternaria* blight particularly on radish seed crop is limited in this country. Therefore, this investigation was undertaken to study the effect of some fungicides with suitable dosage in controlling *Alternaria* blight of radish seed crop.

### MATERIALS AND METHODS

The study was conducted at the East-West Seed Bangladesh Limited Farm, Gorea, Thakurgaon District in the cropping season 2005-2006 under field conditions. Radish var. Rocki (recently introduced from Japan) of East-West Seed Bd.Ltd. was used in this investigation. The land was prepared following the standard method. Root to seed method was employed. Seeds were sown in the bed (10m × 1m) on 5th November, 2005 at the spacing of 20cm × 20cm at the rate of 5 kg/ha. Forty days old stickling (syn. seedling) was uprooted and two-third of the upper portion

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was cutout and used as planting material. On 15<sup>th</sup> December, the stickling was transplanted in the main plot (3m × 3m each) at a spacing of (60 cm × 45 cm) having 30 plants in each plot. Three fungicides namely Iprodione 0.2% (Rovral 50 WP), Mancozeb 0.3% (Dithane M-45) and Carbendazim 0.1% (Shincar 50 WP) were used as foliar spray (Table 1). All fungicides were sprayed at the time of first disease expression up to two times at 15-day interval while the untreated (control) plots were sprayed with only plain water in the same manner. Experiment was set up in Randomized Complete Block Design with three replications. Ten plants from the central rows of each plot were randomly selected and tagged for recording data on leaf area diseased and pod area diseased by eye estimation (Islam *et al.*, 2001). Leaf spot and pod spot severity was recorded at 59 and 80 days after transplanting, respectively. Data on leaf area diseased was taken from all leaves within thirty centimeters from soil level of the plant. Pod area diseased was taken from all pods bearing on three branches including the main rachis of seed stalk within 30 cm from the base. The crop was harvested at 100 days after transplanting and 1000- seed weight, yield per plant and yield (t/ha) were taken and calculated. Data were analyzed statistically. Mean separation of each treatment on different parameters was done by DMRT.

**Table 1. Fungicides were used in the management of *Alternaria* blight as shown below:**

Sl. No.	Trade name	Chemical name	Active ingredient	Conc. (µg/ml)
1	Rovral	3-(3,5 dichlorophenyl)-N-(1 methyl ethyl)-2,4 dioxuimidazolidene Carboxamide (C <sub>12</sub> H <sub>13</sub> ) <sub>3</sub> N <sub>3</sub> C <sub>12</sub>	50% Iprodione	2000
2	Dithane M-45	Manganous ethylene bisdithio carbamate-ion (C <sub>4</sub> H <sub>6</sub> N <sub>2</sub> S <sub>4</sub> )	80% Mancozeb	3000
3	Shincar	Mythyl-2-Benzimidazole Carbamate	50% Carbendazim	1000

## RESULTS AND DISCUSSION

All fungicidal sprays showed significant reduction in disease severity and increment in seed yield. Significantly the highest reduction of leaf area diseased (76.01%) and pod area diseased (81.87%) were found where two sprays of Iprodione (0.2%) were applied (Fig. 1) over control. Single spray of Iprodione was statistically at par with two sprays of Mancozeb (0.3%) both in the percent leaf area diseased and pod area diseased. Mancozeb performed second best in this study. Significantly the highest yield (0.96 t/ha) was obtained in two sprays plots of Iprodione (Fig. 2) where the lowest seed yield (0.56 t/ha) was recorded in Carbendazim (0.1%) in the single sprayed plots. In case of 1000-seed weight, significantly the highest (12.51 g) was obtained in two sprays plots with Iprodione (Table 2).

Among the variables, positive correlations were found between leaf area diseased (%) & pod area diseased (%), yield per plant (g) with 1000-seed weight (g) & yield (t/ha) and 1000-seed weight & yield (t/ha), respectively. However, negative correlations were obtained between leaf area diseased (%) with yield per plant (g), 1000-seed weight (g) & yield (t/ha), and also pod area diseased (%) with yield per plant (g), 1000-seed weight (g) & yield (t/ha) (Table 3). Findings of the present investigation agree with the findings of many earlier workers (Ayub *et al.*, 1996; Shivapuri *et al.*, 1988; Chattopadhyay and Bhunia, 2003). Ayub *et al.* (1996) reported that *A. brassicae* and *A. brassicicola* cause major damage of radish seed crop in Gazipur, Bangladesh. He recommended to spray Iprodione (0.2%) to control the *Alternaria* blight of

**Table 2. Effect of fungicides on the severity of Alternaria blight and yield of radish seed crop cv. Rocki in the cropping season of 2005-2006**

Treatment	Leaf area diseased (%)	Pod area diseased (%)	1000 seed weight (g)	Yield/ plant (g)	Yield (t/ha)
Iprodione single spray	32.69	13.68	11.67	7.52	0.81
Iprodione two spray	23.67	9.67	12.51	9.56	0.96
Carbendazim single spray	51.00	24.00	10.51	5.63	0.56
Carbendazim two spray	46.67	24.00	10.91	6.59	0.66
Mancozeb single spray	39.00	16.00	10.63	6.98	0.70
Mancozeb two spray	28.66	11.67	11.76	7.55	0.81
Control	98.67	53.33	9.57	3.90	0.49
LSD $\geq$ 0.5	6.12	6.19	0.36	0.53	0.06

Values in a column is the mean of three replications

**Fig. 1 Iprodione (0.2%) two sprays plot****Fig. 2 Without fungicide (control) plot****Table 3. Correlation of the disease severity and yield of radish seed crop cv. Rocki in the cropping season of 2005-2006**

Variables		r-value
Leaf area diseased (%)	Pod area diseased (%)	0.996**
	Yield/ plant (g)	-0.911**
	1000 seed weight (g)	-0.888**
	Yield (t/ha)	-0.840*
Pod area diseased (%)	Yield/ plant (g)	-0.894**
	1000-seed weight (g)	-0.863*
	Yield (t/ha)	-0.826*
Yield/ plant (g)	1000-seed weight (g)	0.958**
	Yield (t/ha)	0.973**
1000-seed weight (g)	Yield (t/ha)	0.959**

\* = Significant at  $P \geq 0.05$  level \*\* = Significant at  $P \geq 0.01$  level

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radish seed crop. The similar results were found by Shivapuri *et al.* (1988). They indicated that the *Alternaria* blight of radish was effectively controlled with two spray of Iprodione (0.2%) followed by Mancozeb (0.25). Chattopadhyay and Bhunia (2003) reported that Iprodione (0.2%) is very effective fungicide in controlling *Alternaria* blight of crucifers followed by Mancozeb (0.3%). Therefore, it may be concluded that two sprays of Iprodione (0.2%) at an interval of 15 days may be recommended to control *Alternaria* blight of radish seed crop cv. Rocki to get significantly higher seed yield.

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