
Efficacy of fungicides in control of anthracnose disease of chilli in Sundarban region of West Bengal

A. BISWAS

Bidhan Chandra Krishi Viswavidyalaya, Regional Research Station,
Coastal Zone under NARP, Kakdwip 743347, South 24-Parganas,
West Bengal*

Three sprayings, viz, one in the nursery bed before transplanting and two in the mainfield, i.e., one at one month and another at two months after transplanting, may control anthracnose disease of chilli in Sundarban region of West Bengal. Among the six fungicides tested Bavistin (0.1%) spraying is the best followed by Dithane M 45 (0.25%).

Key words : Chilli, Anthracnose, Control, Carbendazim, Mancozeb

Chilli (*Capsicum annum* L., Family Solanaceae), one of the main cash crops of the coastal saline zone, particularly the Sundarban region of West Bengal during the Rabi season has been observed to suffer due to two very serious forms of anthracnose disease i.e. die-back and ripe fruit-rot, caused by a fungus *Colletotrichum capsici* (Syd.) Butler and Bisby. Sundari, the widely cultivated variety for dried ripe red chilli in Sundarban region is mostly affected by this disease and poses a serious problem to cultivators of this region. The disease symptoms appear mostly on ripened fruits at the end of January to the first half of February when the plants become mature. The fruits with many diseased spots drop off prematurely resulting in heavy loss of yield. Sometimes, the disease causes serious damage to mature dry red fruits in storage and transport. The fungus may also attack the fruitstalk and spread along the stem causing die-back symptoms. In the present paper an attempt has been made to study the efficacy of some commonly available fungicides to control the disease in the field.

* Erstwhile 'Zonal Adaptive Research Station, Govt. of W. Bengal

MATERIALS AND METHODS

A field experiment was conducted for three successive years (1988-89, 1989-90, 1990-91) in the Regional Research Station (Coastal Zone under NARP) of Bidhan Chandra Krishi Viswavidyalaya at Kakdwip, South 24-Parganas with the following seven treatments (T) and one local anthracnose susceptible chilli variety 'Sundari' in randomised block design with three replications.

T ₁ —Foltag (Captafol 80% WDP)	—0.2%
T ₂ —Captan (Captaf 50% W)	—0.25%
T ₃ —Bavistin (Carbendazim 50% WP)	—0.1%
T ₄ —Blitox (Copper oxychloride 50% WDP)	—0.4%
T ₅ —Dithane M-45 (Mancozeb 75% WP)	—0.25%
T ₆ —Cuman L. (Ziram 27% SC)	—0.3%
T ₇ —Control (Water spraying)	

Seven separate nursery beds, each with a size of 90 cms X 30 cms for each treatment, were prepared. Soil of nursery bed was highly pulverised and was raised 15 cms from the soil of field. Well decomposed farmyard manure or compost was applied @ 20 tonnes/ha. during the last ploughing. A 15 cms deep irrigation channel was prepared around each nursery bed. During October—November untreated seeds of the said chilli variety @ 10 g/bed were sown thinly in lines spaced 5 cms apart, sand and well decomposed compost were sprinkled over the seeds. A fine mulching with paddy straw was given soon after sowing to prevent excessive moisture loss. The mulch was removed as soon as the seeds start germinating. Water was not allowed to stagnate on the bed. Seeds germinated in 7 days and 30 days old seedlings were sprayed with fungicides treatment wise.

The main experimental field was ploughed 3-4 times to get a fine tilth. FYM or compost @ 10 tonnes/ha. was incorporated during the last ploughing.

Seedling were transplanted in the main experimental field after one week of spraying in the nursery beds. The size of each plot in the main experimental field was 3 m X 3 m. Each plot contained 36 plants in 6 rows with a wider spacing of 60 cm X 60 cm for convenience of making better interculture operations and recording data. Inter-plot spacing was 1 m.

The plants were applied with a fertilizer level of 70, 35, 35 kg respectively per hectare of N, P₂O₅, K₂O. Half of nitrogen and full of phosphorus and potassium fertilizers were applied at the time of transplanting while rest half of the nitrogen was applied at the time of flowering i. e. about one month after transplanting. A light irrigation was given just after transplanting and thereafter needbased irrigations were followed. Other normal interculture

operations were followed. Two spraying were done in the mainfield, i. e. one at one month after transplanting and another at two months after transplanting.

Data on incidence of anthracnose disease was recorded three times, i. e. one in the nursery bed just before transplanting, another at about 15 days after 1st spraying in the mainfield and the last one at about 15 days after 2nd spraying in the mainfield. Die back was expressed as % by counting number of affected and total plants in each treatment. Fruit rot infection was assessed at the time of each picking and recorded as % of infected fruits from total number of fruits picked.

Data are presented in Table 1.

RESULTS AND DISCUSSION

It was observed in the experiment that the nursery beds except the control one were free from the disease till transplanting though the seeds were not pretreated with any fungicide. However, one spraying in the nursery bed was proved beneficial as prophylactic measure. About 5-10% seedlings of the control nursery bed were affected as no fungicide was sprayed there. The disease appeared later in the mainfield, possible might be due to the secondary infection. Two sprayings in the mainfield after transplanting, i. e. one at one month after transplanting and another at months after transplanting, reduced the disease in a considerable amount. Table 1 indicates that among the six fungicides tested, Bavistin is the best followed by Dithane M-45 which controlled the disease to a great extent in comparison to other fungicides for the three successive years.

More or less similar results were found by other workers in different states of India. Narain and Panigrahi (1971) observed Ziram to be most effective against *C. capsici*. Jharia *et al.* (1977) reported that four sprays of Zineb (0.25%) were most effective against die-back and fruit rot. Captafal (0.2%) sprays at monthly interval commencing from transplanting against anthracnose and Mancozeb against ripe fruit-rot were advocated by Chauhan and Duhan (1977). Bavistin (0.1%) spray was also reported to give control of this disease (Sankaralingam *et al.*, 1983).

No adverse effect on fruit was noticed from any fungicide. It, was, however, observed that the fruits which were sprayed with fungicides dried better than the fruits of the control plot. Healthy fruits harvested from the plots sprayed with fungicides remained healthy after drying and the skin of the dried ripe fruits were bright red even in storage. But fruits from control plots that were healthy when picked, showed diseased spots afterwards

Table 1. Data showing efficacy of six fungicides to control anthracnose disease of chilli under conditions at Kakdwip during three successive years

Fungicides	1988-89				1989-90				1990-91			
	1		2		1		2		1		2	
	A	B	A	B	A	B	A	B	A	B	A	B
Faltaf	5.5 (13.5)	6.0 (14.1)	5.0 (13.1)	4.0 (11.4)	6.0 (14.2)	6.5 (14.7)	5.0 (12.9)	5.0 (12.9)	6.4 (14.6)	7.0 (15.3)	5.9 (14.1)	6.5 (14.7)
Captan	6.0 (14.1)	5.0 (12.8)	3.5 (10.7)	3.5 (10.6)	6.5 (14.7)	5.0 (12.9)	6.3 (14.4)	4.7 (12.5)	7.3 (15.6)	5.0 (12.9)	6.9 (15.1)	4.6 (12.3)
Bavistin	4.0 (11.5)	2.5 (8.7)	2.5 (9.0)	1.5 (6.9)	4.5 (12.2)	2.0 (8.1)	4.0 (11.5)	1.5 (6.9)	4.5 (12.2)	2.6 (9.3)	3.8 (11.1)	2.2 (8.5)
Blitox	6.5 (14.7)	7.5 (15.8)	6.0 (14.0)	4.5 (12.1)	7.5 (15.8)	9.0 (17.5)	6.5 (14.7)	7.8 (16.2)	8.2 (16.6)	8.5 (16.9)	8.0 (16.4)	7.8 (16.1)
Dithane M-45	4.5 (12.1)	3.0 (10.0)	3.0 (10.0)	3.0 (10.0)	5.0 (12.9)	3.5 (10.8)	4.8 (12.6)	3.0 (10.0)	5.5 (13.5)	3.5 (10.8)	4.8 (12.8)	3.0 (10.0)
Cuman L	5.8 (13.1)	3.5 (10.7)	4.0 (11.4)	3.2 (10.2)	7.0 (15.3)	6.0 (14.2)	7.0 (15.3)	5.5 (13.5)	8.2 (16.6)	6.4 (14.6)	8.1 (16.5)	5.7 (13.8)
Control	8.6 (17.1)	20.6 (26.9)	12.7 (20.9)	35.0 (36.3)	9.7 (18.1)	22.5 (28.3)	12.4 (20.7)	36.2 (37.1)	12.9 (21.0)	20.2 (26.7)	15.9 (23.5)	37.7 (37.9)
C.D. (0.05)	3.88	1.83	3.04	2.86	2.50	2.70	1.92	3.31	6.29	3.79	3.98	5.07

Each data is average of 3 replicat'ons

1 = 1st date of recording of data

2 = 2nd date of recording of data

Values in parentheses indicate angular transformed values

A = % incidence of die back

B = % incidence of fruit rot

during storage. In control, where sterile distilled water was sprayed, all fruits which were severely infected dropped off from plants.

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