



Efficacy of different fungicide against anthracnose of mango (*Mangifera indica* L.) in Eastern Bihar

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Abstract : India is the largest producer of mango (*Mangifera indica* L.) in the world accounting for 52-63 per cent of total production. One of the major constraints in mango production is anthracnose disease caused by *Colletotricum gloeosporioides*, perfect stage-*Glomerella cingulata*. It invades on leaves, twigs, inflorescence and fruits reasonably ample loss considering total fruit reduction and production of poor quality fruit produced, rendered decreased rate in price. Therefore, an attempt was made with different fungicides in controlling anthracnose of mango. This investigation suggests carbendazim (4.48% PDI) as the most effective fungicide rendering maximum yield (126.8 kg/ tree).

Key Words : Mango crop, Anthracnose, Fungicides

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INTRODUCTION

Mango (*Mangifera indica* L.) is the leading fruit crop of India and considered to be the king of fruits, besides delicious taste, excellent flavour and attractive fragrance. It is rich in vitamin A and C. The tree is hardy in nature and requires comparatively low maintenance costs. Mango is the most important fruit covering about 35 per cent of area and accounting of 22 per cent total production of total fruits in the country, which is highest in the world with India's share of about 54 per cent. India has the richest collection of mango cultivars. The crop is of increasing significance because of its demand in the international market and worldwide expansion of mango production up to 27.9 mt of fruit during 2005 (Arauz, 2006). Unfortunately this crop suffers from a number of diseases at all stages of its development *i.e.* right from nursery stage to grow-up plant. Among the major diseases of mango, mango anthracnose disease cause considerable damage to mango crop (Prakash, 2004).

Anthracnose is present recognized as a most important field of mango worldwide (Ploetz and Prakash, 1997). Mango anthracnose (a fungal infection) caused by *Colletotricum*

gloeosporioides is one of the most prominent diseases that mango producers must combat in Eastern Bihar and other parts of India where mangoes are grown. The disease symptoms appear on leaves, twigs petioles, panicles and fruits. Anthracnose-free mangoes are almost impossible to contain in spite of extensive field application of fungicides, which have been effective in reducing the disease. (Mc-Millan, 1971; Rucle and Ledin, 1955). Many fungicides have been recommended against mango anthracnose. However, the search for newer and safer fungicides against major diseases is minimizing the diseases to the maximum extent as possible. Therefore, an attempt was made to study the comparative efficacy of different fungicides for the management of mango anthracnose.

MATERIALS AND METHODS

The experiments were conducted at the Sub Tropical Fruits (STF) Farm, Department of Horticulture, Bihar Agricultural University, Sabour, Bhagalpur-813210 (Bihar), India for five crop seasons (2007-08 to 2011-12) in Randomized Block Design with nine fungicide treatments and four

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replications on most popular mango variety Lagra (Malda). The fungicides used were carbendazim @0.1% (Bavistin 50WP), thiophanate methyl @0.1% (Roko 70WP), mancozeb @0.2% (Indofil M-45 75WP), chlorothalonil @0.2% (Kavach 75 WP), propineb @0.2% (Antracol 70WP), companion @0.2% (carbendazim 12% + mancozeb 63%), tricyclazole @0.1% (Beam 75WP), hexaconazole @0.1% and (Control). The first round sprays in the experiment with fungicides on new flush and the two more sprays were given at 10 days interval. Water sprayed trees served as control. Observations on the disease severity were recorded at 10 days after the third spray with fungicides by using 0-5 scale (Narasimhudu, 2007) as: 0 = healthy; 1 = up to 10; 2 = >10 to 20; 3 = >20 to 30; 4 = >30 to 50 and 5 = > 50 per cent leaf/fruit area infected. The per cent disease index (PDI) and per cent disease control (PDC) were calculated as per the standard formula (Das and Raj, 1995). Replicated fruit yield were recorded and expressed as kg/tree. The trees were 10 years old. For each treatment 3 replications were maintained. The percentage of mango anthracnose was observed visually. The data for the five years were pooled and analysed using a Complete Randomized Block Design.

RESULTS AND DISCUSSION

All the fungicides were effective in the suppression of the disease in the five years average of incidence of mango on Langra (Malda) germplasm (Fig. 1). Carbendazim @ 0.1 % was more effective (PDI value of 4.48). It was followed by thiophanate-methyl (0.1%), tricyclazole (0.1%), companion (0.2%), mancozeb (0.2) propineb (0.2%) chlorothalonil (0.2%) and hexaconazole(0.1%) . Carbendazim @ 0.1% was the most effective (<4.48 PDI) in the five years. Per cent disease control in five years pooled mean revealed that the minimum disease control was noticed in the trees treated with hexaconazole (17.34%) and was closely followed by trees treated with chlorothalonil (14.46%) and propineb (13.22%). Increase of fruit yield /tree was also reflected in fungicidal treatments and differed significantly among them. The highest fruit yield was

obtained in carbendazim treated tree (126.80kg/tree) followed by thiophanate-methyl (123.20kg/tree) and tricyclazole (122.00kg/tree). The lowest fruit was recorded in hexaconazole (108.02kg/tree) which was statistically at par with chlorothalonil (109.58kg/tree) (Table 1). Several workers have reported efficacy of different fungicides viz., carbendazim, thiophanate methyl, chlorothalonil and mancozeb (Sharma and Verma 2007), carbendazim and benomyl (Ray *et al.*, 2005), carbendazim (Prakash and Misra, 1988), mancozeb (Lingaraj, 1969), carbendazim and zineb (Jadeja and Vaibhav, 1980), benomyl, thiophanate methyl, captafol and vinclozolin (McMillan, 1973), zineb, maneb and captan, benomyl (McMillan, 1971), mancozeb (Ahmed *et al.*, 1991) and thiophanate methyl, thiophanate methyl and mancozeb and benomyl (Akhtar *et al.*, 1998) against anthracnose of mango in *in vitro* and *in vivo* conditions. The present investigation has demonstrated that carbendazim @ 0.1% is the most promising fungicide in the field and this can be recommended for the controlling anthracnose of mango.

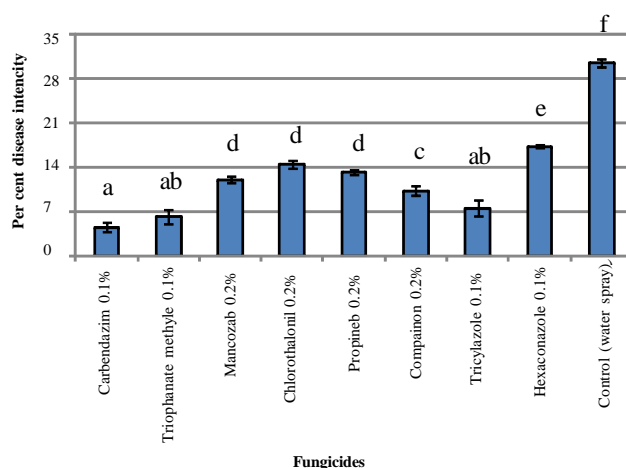


Fig. 1: Effect of different fungicides against anthracnose of mango depicting pooled value over five years. The error bars are standard error of means

Table 1: Effect of fungicides against mango anthracnose and increase fruit yield per tree (age 10 year) in tests for five years

Treatments	Conc. (%)	Per cent disease intensity	Fruit yield (kg) per tree (age 10 year)					Mean
			07-08	08-09	09-10	10-11	11-12	
Carbendazim	0.1	4.48	137.00	Nil	110.94	Nil	132.46	126.80
Triophanate methyl	0.1	6.18	126.00	Nil	122.99	Nil	120.62	123.20
Mancozeb	0.2	12.07	116.66	Nil	114.27	Nil	112.99	114.64
Chlorothalonil	0.2	14.46	110.00	Nil	109.26	Nil	109.49	109.58
Propineb	0.2	13.22	113.66	Nil	112.02	Nil	111.03	112.24
Companion	0.2	10.32	118.33	Nil	116.83	Nil	113.46	116.20
Tricyclazole	0.1	7.50	125.00	Nil	122.33	Nil	119.16	122.16
Hexaconazole	0.1	17.34	108.66	Nil	108.08	Nil	107.33	108.02
Control		46.43	54.51	Nil	44.30	Nil	43.87	47.56
C.D. at 5%		2.40	3.90	-	3.02	-	2.98	3.24

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