

Chemical Control of Sigatoka Leaf Spot (*Mycosphaerella musicola*) of Banana

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SUMMARY

A field experiment was conducted during two years to find out the effectiveness of different chemical fungicides against sigatoka leaf spot (*Mycosphaerella musicola*) disease of banana. Among all the treatments tested, four sprays of any one of the fungicides at monthly interval starting after six months of planting gave effective and economical control i.e. Carbendazim @1.0g/l or Tridemorph @0.7 ml/l or Propiconazole @1.0 ml/l or Thiophanate methyl @1.0g/l.

Banana (*Musa paradisiaca* L) is one of the most fascinating and important fruit crops. It is a large monocotyledonous herb that originated in south East Asia.

After rice, wheat and milk, it is the fourth most valuable food. In export, it ranks fourth among all agricultural commodities and is the most significant of all fruits with world trade totality 2.5 billion annually. Diseases are among the most important limiting factor in banana production world wide (Simmonds, 1966). Among various diseases of banana, leaf spot or yellow sigatoka caused by *Mycosphaerella musicola* is a very serious disease in tropical banana growing areas (Stover, 1980). Sigatoka leaf spot affects not only the banana leaves, but also bunch weight and fruit quality. Leaf spot when severe reduces yield when less than six viable leaves remain at harvest. Leaf spot may also cause early maturity and premature ripening of fruits. Banana from leaf spot infected plants can ripen in the field. These field ripen bunches harbor fruit fly and are unmarketable. Even unripe fruits from affected bunches are unsaleable, because they are likely to ripen in transit to market (Mourichon *et al.*, 1997).

Banana is one of the major fruit crops of south Gujarat. The sigatoka leaf spot is one of the major foliage diseases prevalent in susceptible variety of all Cavendish group including basrai. Hence, to get higher production of banana fruit yield, there is need to evaluate the efficacy of some fungicides for the management of this disease. Therefore, the present trial was conducted to find out effective and economical chemical for managing yellow sigatoka leaf spot disease.

MATERIALS AND METHODS

A field trial was laid out to find out the effect of various chemicals on yellow sigatoka leaf spot of banana cv. BASRAI at Fruit Research Station, Navsari Agricultural University, Gandevi, Gujarat for two seasons. The experiment was conducted in RBD with three replications. There were 11 treatments including control. The plant to plant and row to row spacing were 1.8 x 1.8 m. All the recommended agronomic practices for raising crop were followed. The treatment details were given in Table 1.

Table 1: Treatment details

Sr. No.	Treatments	Doses
1.	Tridemorph	0.7 ml/l
2.	Hexaconazole	2.0 ml/l
3.	Propiconazole	1.0 ml/l
4.	Propineb	2.0 g/l
5.	Tebuconazole	1.0 ml/l
6.	Carbendazim	1.0 g/l
7.	Companion	1.0 g/l
8.	Mancozeb flowable	2.5 ml/l
9.	Chlorothalonil	2.0 g/l
10.	Thiophanate methyl	1.0 g/l
11.	Control	–

These fungicidal treatments were sprayed four times at monthly interval after six month of planting. The effectiveness of fungicides were recorded on the basis of severity of yellow sigatoka leaf spot disease by using Gauhls modification of Stover's severity scoring system (Gauhls, 1989) by calculating severity index, yield and economics.

Key words :

Sigatoka leaf spot,
Mycosphaerella
musicola,
Banana.

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RESULTS AND DISCUSSION

The pooled data of two years which year which years (Table 2) on mean infection of leaf spot disease index revealed that all the fungicidal treatments were significantly superior over control in order to reduce the sigatoka leaf spot disease. Similarly, there was a significant difference in fruit yield on fungicidal treated and control plants indicating the effectiveness of different fungicides against sigatoka leaf spot, which results into higher yield.

Based on the two years pooled data (Table 2)

Table 2: Effect of different fungicides on sigatoka leaf spot disease and yield of banana cv. BASRAI (Two years pooled)

Sr. No.	Treatments	Pooled PDI	Yield (pooled) t/ha
1.	Tridemorph	16.40* (8.01)	67.64
2.	Hexaconazole	16.25 (7.92)	67.95
3.	Propiconazole	13.97 (6.02)	72.78
4.	Propineb	23.37 (15.94)	61.21
5.	Tebuconazole	17.59 (9.21)	65.83
6.	Carbendazim	16.76 (8.46)	67.81
7.	Companion	21.11 (13.2)	61.46
8.	Mancozeb flowable	24.69 (17.57)	59.36
9.	Chlorothalonil	25.67 (18.83)	59.66
10.	Thiophanate methyl	21.55 (13.56)	63.05
11.	Control	37.05	48.44
	C.D.	(18.07)	

* Indicates Arcsine transformed values

* Figures in parenthesis indicate original mean values

thiophanate methyl with leaf spot index of 17.59%, 21.11% and 21.55%, respectively. Romero and Sutton (1997) reported about the control of *Mycosphaerella fijiensis*, the causal agent of black sigatoka of banana with propiconazole. It is evident from the data that the application of carbendazim had brought about the reduction of sigatoka leaf spot disease. Eswaramurthy *et al.* (1988) reported that application of carbendazim and aureofungin had brought about the reduction of banana wilt and sigatoka leaf spot in banana.

As regards the yield, there was a significant difference among the various treatments as compared to control. Propiconazole (72.78 t/ha), hexaconazole (67.95 t/ha), carbendazim (67.81 t/ha), tridemorph (67.64 t/ha) and tebuconazole (65.83 t/ha) were at par and superior than rest of treatments and recorded higher yield (Table 2).

The cost benefit ratio for different fungicidal treatment is given in Table 3. carbendazim @1.0g/l was found effective and economical with maximum CBR (1:15.22). Next best in order of merit were tridemorph 0.7 ml/l with ICBR (1:15.03), propiconazole (1:10.78), thiophanate methyl (1: 9.26) and hexaconazole (1:8.72). Price of banana = Rs. 4055 / ton

Thus, from the present investigation, it is revealed that carbendazim, tridemorph, propiconazole, hexaconazole were found superior in reducing the yellow sigatoka leaf spot disease which also gave higher yields.

Table 3: Economics of different fungicides used for management of sigatoka leaf spot

Sr. No	Treatments	Cost of fungicides with labour charges (Rs./ha)	Yield (t/ha)	Income (Rs./ha)	Additional income over control (Rs./ha)	I.C.B.R.
1.	Tridemorph	5180 = 00	67.64	2,74,280	77856	1:15.03
2.	Hexaconazole	9072 = 00	67.95	2,75,537	79113	1:8.72
3.	Propiconazole	9154 = 00	72.78	2,95,122	98698	1:10.78
4.	Propineb	6752 = 00	61.21	2,48,206	51782	1:7.67
5.	Tebuconazole	–	65.83	2,6,940	70516	–
6.	Carbendazim	5158 = 00	67.81	2,74,969	78545	1:15.22
7.	Companion	–	61.46	2,49,220	52796	–
8.	Mancozeb flowable	–	59.36	2,40,704	44280	–
9.	Chlorothalonil	9077 = 00	59.66	2,41,921	45497	1:4.70
10.	Thiophanate methyl	6400 = 00	63.05	2,55,667	59243	1:9.26
11.	Control	–	48.44	1,96,424	–	–

Price of banana = Rs. 4055 / ton

propiconazole, hexaconazole, tridemorph and carbendazim remained significantly at par with each other and recorded least leaf spots viz., 13.97%, 16.25%, 16.40% and 16.76%, respectively. Next in order of effectiveness were tebuconazole, companion and

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