HortFlora Research Spectrum, 1(4): 371-374 (2012) ISSN : 2250-2823

MANAGEMENT OF PHOMOPSIS LEAF BLIGHT OF BRINJAL THROUGH DIFFERENT FUNGICIDES AND BIOPESTICIDE

Ramesh Singh, P.C. Singh, Dinesh Kumar and N.S. Sachan[1]

Deptt. of Plant Pathology, T.D.P.G. College, Jaunpur-222 002

[1]Oil Seeds Section, C.S.Azad University of Agri. & Tech., Kanpur

ABSTRACT: Phomopsis leaf blight caused by *Phomopsis vexans* is an important disease of Brinjal (*Solanum melongena* L.) in Eastern U.P. Therefore, efficacy of fungicides and biopesticides were tested *in-vitro* and *in-vivo*. Bavistin (0.1%), Vitavax (0.1%), Blitox-50 (0.2%), and Ridomil (0.15%) proved to be the most effective in inhibiting the growth of pathogen *in-vitro* and controlling the disease in the field. Biopesticide, Nimbidine was also proved effective, but slightly less effective than systemic fungicide except Indofil M-45, Nimbidine being a safe eco-friendly and economical bioproduct which can be used in the management of the disease.

Key words: *Brinjal, Phomopsis leaf blight, Phomopsis vexans, management, fungicide, biopesticide.*

Brinjal or egg plant (*Solanum melongena* L.) is one of the most common, popular vegetable crop grown in almost worldwide. India is considered to be the centre of origin of cultivated brinjal, from where it spread to the other parts of the world (Chaudhury and Kalda, 2). Brinjal was observed to suffer from Phomopsis leaf blight and fruit rot, caused by *Phomopsis vexans*, is considered to be the most destructive disease of brinjal (Kumar, 5). Phomopsis blight was first time reported in India in Bombay (Uppal *et al.,* 9). Not much work has been done on this disease except that the report of its occurrence. Recently, the disease has assumed serious proportion damaging the crop to the tune at 35-40 per cent. Therefore, it was felt necessary to study the management of disease through the use of fungicides and biopesticide.

MATERIALS AND METHODS

The efficacy of fungicides and biopesticides against the pathogen *in-vitro* was tested by poison food technique described by Schmitz (8) using PDA Medium. Bavistin,Vitavax, Blitox-50, Chlorothionil, Ridomil, Indofil M-45, Zineb, Kitazin, Captofol and one antibiotic Streptocycline (0.2%) and biopesticide Nimbidine, *Bael* and *Ashok* extract (1.0%) were used (Table 1).

Extracts of botanicals-*Bael* (*Aegle mormelos*) and *Ashok* (*Polyalthia longifolia*) were prepared by crushing their leaves (100 g each) in 100 ml of sterilized distilled water. The extract were then filtered through a muslin cloth and centrifuged for 30 min at 5000 rpm. The extracts were sterilized by passing them through a Millipore filter (0.22 m pore size) using a swimmy filter adapter. The materials were dried at room temperature (25+2°C) for 6 hours to remove the traces of water. Subsequently 1% concentration of the extract of each botanical was used for bio-assay test by food poison technique. The radial growth of *Phomopsis vexans* in three replications were recorded separately and their averages were taken. The per cent inhibition over control was calculated by the formula (Bliss, 1) as given below :

$$\text{Per cent inhibition over control} \quad ..... \quad \frac{C-T}{C} \times 100$$

Where, C= growth of fungus in control.

T= growth of fungus in treatment.

In order to find out a suitable control of the disease, efficacy of fungicides and biopesticides were assessed in field trial at Student Research Farm of T.D.P.G. College, Jaunpur during *Kharif* season 2005-2006 and 2006-2007. The disease susceptible variety "Arka Keshav" of brinjal was transplanted in 4x4 m plot size in Randomized Block Design with 4 replications. Sixty days old

Received : 03.8.2012 *Accepted : 26.8.2012*

Table 1: Effect of fungicides and biopesstcides on colony growth of *Phomopsis vexans* on P.D.A.

Product	Conc. w/v	Av. Colony diameter after 5 day (mm)	Per cent inhibition over control
Bavistin	0.10	0.0	100
Vitavax	0.10	0.0	100
Blitox-50	0.20	0.0	100
Ridomil	0.20	0.0	100
Nimbidine	0.50	2.50	97.05
Inofil M-45	0.20	4.95	94.17
Chlorothonil	0.20	7.95	90.67
Kitazin	0.20	9.20	89.17
Zineb	0.20	10.12	88.94
Captofol	0.20	14.15	83.35
Bel extract	1.00	16.30	80.82
Ashok extract	1.00	19.25	77.35
Streptocycline	0.20	26.00	69.41
Control	-	85.0	-
C.D. (P = 0.05)	-	4.98	-

Table 2: Efficacy of fungicides and biopesticides against Phomopsis leaf blight of brinjal under field condition.

Product	Dose %	Disease incidence %			Yield (q/ha)		
		2006	2007	Mean	2006	2007	Mean
Bavistin	0.10	9.25 (17.70)	8.00 (16.42)	8.62 (17.07)*	228	239	235.5
Vitavax	0.10	9.10 (17.55)	10.20 (18.62)	9.65 (18.09)	238	223	230.5
Blitox-50	0.20	11.75 (20.04)	12.00 (20.26)	11.86 (20.14)	228	219	223.5
Ridomil	0.20	12.50 (20.70)	13.30 (21.38)	12.90 (21.04)	216	208	212.0
Nimbidine	0.50	15.25 (22.90)	14.60 (22.46)	14.92 (22.74)	196	203	199.5
Indofil-45	0.20	17.56 (24.77)	18.25 (25.29)	17.90 (25.02)	189	182	185.5
Control	—	32.20 (34.57)	33.80 (35.54)	33.00 (35.06)	140	136	138.0
C.D. (P = 0.05)		(2.43)	(2.15)	(2.05)	6.5	5.3	5.9

* Figures in parenthesis are angular transformed value.

plants were artificially inoculated by spraying of mycelium cum spore suspension of the pathogen and the plots were irrigated from time to time, to maintain proper moisture.The five fungicides *viz*. Bavistin and Vitavax (0.1%), Blitox-50 (0.2), Ridomil (0.2%), Indfil M-45(0.2%) and one biopesticide Nimbidine (0.5%) were used as spray (Table 2). The first spray was done at the onset of disease followed by two more spray at 15 days intervals. The control plots were sprayed with water only. For recording the disease intensity one hundred randomly selected leaves per plot were examined after 15 days of the last spray and the percentage of disease intensity was transformed into angles and analysed statistically. Yield was estimated on plot basis without considering the border rows in q/ha.

RESULTS AND DISCUSSION

The results presented in (Table 1) indicate that all the fungicides, plant extracts and bio-pesticides were significantly superior over control in inhibiting the growth of the pathogen *in-vitro*. Bavistin, Vitavax, Blitox-50 and Ridomil were the most effective fungicides and they completely inhibited the growth of pathogen. Nimbidine and Indofil M-45 were found to be the next best in inhibiting the growth of pathogen. These were statistically at par and showing 97.05 and 94.17 per cent inhibition over control, respectively. The Captafol was the least effective fungicide. *Bael* and *Ashok* extracts inhibited 80.82 and 77.35 per cent growth of pathogen and appeared statistically at par to each other. The radial growth of the pathogen in the case of rest of fungicides varied from 7.95 to 14.15 mm that showed their ineffectiveness. The finding of Mohanty *et al.* (6) also confirmed the effectiveness of Bavistin, Blitox -50, Ridomil and Indofil M-45 in checking the growth of *P. vexans* under laboratory condition. Mohanty *et al.* (7) observed fungicidal properties of the *Bael* and *Ashok* leaf extract against *P. vexans in-vitro.*

The results of field test with five fungicides and one bio-pesticide Nimbidine (Table 2) indicate their effectiveness in managing the disease. Spraying of Bavistin (0.1%), and Vitavax (0.1%) at the intervals of 15 days was more effective in minimizing the disease incidence and increasing the yield and proved statistically at par. Highest yield of 235.5 q/ha was obtained with Bavistin followed by Vitavax 230.5 q/ha. The next effective fungicide was Blitox-50 (0.2%) which showed 11.86 per cent disease and 223.5 q/ha yield. Indofil-45 (0.2%) proved to be the least effective one. The bio-pesticide, Nimbidine was numerically better than Indofil M-45 but was at statistically different showing mean disease incidence 14.92 and 199.5 q/ha yield against 31 per cent disease and 182.5 q/ha yield in water sprayed check plots.

The performance of systemic fungicide was better than non-systematic fungicide and it could be possible to control the disease through the spraying of fungicide on brinjal. Observation of Das (3) on control of Phomopsis blight of Brinjal by 3 spraying of Bavistin and Indofil M-45 support the observation regarding foliar sprays. Similarly, Islam and Pan (4) suggested that Phomopsis blight of brinjal can be managed by the spraying of Bavistin and Vitavax.

REFERENCES

1. Bliss, C. I. (1934). The method of probits. *Science*, **79:** 38
2. Chaudhury, B. and Kalda, T.S.(1968). Brinjal: a vegetable of the masses. *Indian Hort.,* **12**: 21-22.
3. Das, S.R.(1995). Bioefficacy and economics of fungicides in control of phomopsis leaf blight / fruit rot of brinjal. *Orissa J. Hort.*, **23:** 1-2.
4. Islam, S.J. and Sitansu, Pan (1993). Economics of fungicides in control of phomopsis leaf blight of egg plant. *Indian Phytopath.,* **46:** 318.
5. Kumar, S. (1998). Epidemiology and management of Phomopsis disease of brinjal. *Ph.D.*

Thesis, Deprtment of Plant Pathology, CSK, Himanchal Pradesh Agricultural University, Palampur, pp. 87.

6. Mohanty, A.K., Panda, R.N., Sethi, P.N. and Kuar, A.K. (1994). Efficacy of certain fungicides in controlling *Phomopsis vexans* causing fruit rot of brinjal. *Orissa J. Agric. Res.*, **7:**858-86.
7. Mohanty, A.K., Panda, R.N., Kuar, A.K. and Sethi, P.N. (1995). Effect of certain leaf extract in controlling *Phomopsis vexans* causing fruit rot of brinjal. *Crop Res.,* **9** (1): 165-167.
8. Schmitz. H. (1930). Suggested toximetric method for wood preservative. *Indust. Fengin Chem.* (Fed.). **4:** 361-633.
9. Uppal, B.N., Patel, M.K. and Kamat, M.N. (1935). *The fungi of Bombay Bull.*, **178**:56.