



CHEMICAL CONTROL OF PHYTOPHTHORA BLIGHT OF SESAME

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ABSTRACT

Phytophthora blight of sesame is an economic important disease which, cause severe losses during heavy monsoon. Three years field experiments were conducted for testing of different fungicides for control of sesame phytophthora blight caused by *Phytophthora parasitica* var. *sesame*. Lowest disease intensity (19.47%) was recorded in three sprays of ridomil MZ 72%) (Metalaxyl 8%wp + mancozeb 63%wp) at 0.20% followed by fosetyl-Al (0.15%) and

mancozeb (0.20%) with 27.36% and 31.58 % disease intensity, respectively. Highest seed yield(800kg/ha) was recorded in the three sprays of 0.20% ridomil MZ 72%wp, followed by fosetyl-Al (0.15%) and mancozeb (0.20%). Maximum net return was received in mancozeb (Rs.11646/ha) followed by Ridomyl MZ-72 (Rs 9731/ha) and fosetyl-Al (Rs.7926/ha). Phytophthora blight of sesame can be managed effectively and economically with three sprays of ridomil MZ-72 (0.20%) or mancozeb (0.20%) at 15 days interval.

Keywords: Phytophthora blight, sesame, fungicides, *Phytophthora parasitica* var. *sesame*.

INTRODUCTION

Sesame is an important edible oilseed crop. Sesame is suffering many diseases. Phytophthora blight of sesame caused by *Phytophthora parasitica* var. *sesame* Butler is an important disease of sesame. Phytophthora blight of sesame was first reported in India by Butler. The mortality of the plants due to the disease may be as high as 72 to 79% (Singh *et al.*, 1976). This disease has economic importance in the state of Gujarat, Madhya Pradesh and Rajasthan in India (Kale and Prasad, 1957). The disease becomes sever under continuous rainy days. The symptoms appear on all aerial parts of plants. Under wet and warm condition the disease

covers whole field within few days. Looking to the damage and loss due to this disease, three years field experiments were conducted for find out effective fungicides for control of *Phytophthora* blight.

MATERIALS AND METHODS

Three years field experiments were conducted at Department of Plant Pathology, College of Agriculture, Gujarat Agricultural University, Junagadh during 2002, 2003 and 2004 *Kharif*. The experiment was arranged in randomized block design, keeping four replications. The sesame cultivar Gujarat Til-1 was sown. Fungicides *viz.* ridomil MZ.72% wp (Metalaxyl 8% wp + mancozeb 63% wp) 0.20%, fosetyl-Al 80% wp (0.15%), mancozeb 75% wp (0.20%), copper oxychloride 50% wp (0.20%), Bordeaux mixture (1.0%) and hexaconazole 5EC (0.005%) were tested along with control. The first spray was started immediately after initiation of symptoms developed on lower leaves; subsequently two sprays at 15 days interval were carried out. The disease intensity was recorded after one week of last spray and seed yield recorded.

RESULTS AND DISCUSSION

The results presented in Table-1 revealed that *Phytophthora* blight intensity was significantly reduced in all fungicides treatments. Minimum PDI (19.47%) in all the years was recorded in metalaxyl + mancozeb (0.20%). It was followed by fosetyl-Al (0.15%), mancozeb (0.20%), and chlorothalonil (0.20%) with 27.36%, 31.58% and 38.60%, respectively while, hexaconazole (0.005%) was found least effective against *Phytophthora* blight of sesame.

The seed yield was also increased in all treatments during individual season. Highest mean seed yield was obtained in metalaxyl+ mancozeb (800kg/ha). However, it was at par with fosetyl-Al (734 kg/ha) and mancozeb (721kg/ha).

While comparing the economics of all treatments, maximum net return of Rs. 11646/ha was received in mancozeb (0.20%), which followed by metalaxyl+ mancozeb (0.20%) (Rs. 9731/ha) and fosetyl-Al 0.15% (Rs.7926/ha). Highest incremental cost benefit ratio (ICBR) 1:9.63 was also found in mancozeb(0.20%). Although second highest ICBR (1:5.8) was received in Bordeaux mixture 1% but the net return was comparatively low. Looking to the disease control, seed yield and net return, three sprays of mancozeb (0.20%) or metalaxyl+ mancozeb (Ridomil MZ 72% WP) 0.20% at 15 days interval are recommended for the control of *phytophthora* blight of sesame. Sharma *et al.* (1970) tested ten different fungicides among

them, dithan M-45 which was the most economic for control of buckeye rot of tomato caused by *Phytophthora nicotianae* var *parasitica*. A mixture of metalaxyl + mancozeb (0.20%) applied at 14 and 21d interval in potato crop against *Phytophthora infestans*, improve yield by 19.8 and 13.11%, respectively (Anonymous ,1979). Vyas (1981) reported that sprays application of dithiocarbamate fungicides such as mancozeb (0.30%) or zineb (0.30%) were found effective for the control of *Phytophthora* blight of sesame. Farih and jriifi (1998) reported that metalaxyl and fosetyl- Al were effectively control *Phytophthora citrophthora* caused brown rot in citrus. Minuto *et al.* (2000) tested fungicides against *Phytophthora nicotianae* var *parasitica* caused root rot of lavender, among fungicides metalaxyl showed the best efficacy for control of *Phytophthora* root rot.

Table 1.1: Effect of fungicides on incidence of phytophthora blight of sesame (Pooled).

Treatment	Percent Disease Incidence			
	2001-02	2002-03	2003-04	Pooled PDI
Metalaxyl + mancozeb	24.45 (17.50)*	20.18 (11.91)	33.91 (31.12)	26.18 (19.47)
Mancozeb	33.17 (29.90)	28.14 (22.24)	41.25 (43.45)	34.19 (31.58)
Fosetyl- Al	32.25 (28.25)	24.01 (16.64)	38.35 (38.50)	31.54 (27.36)
Copper oxychloride	40.39 (42.00)	31.46 (27.32)	47.95 (55.12)	39.93 (41.20)
Chlorothalonil	36.99(136.25)	34.68 (32.37)	43.56 (43.40)	38.41 (38.60)
Bordeaux Mixture	39.15(40.00)	36.99 (36.20)	52.56 (63.10)	42.90 (46.34)
Hexaconzole	42.84 (48.00)	47.91 (55.07)	56.48 (69.10)	49.08 (57.10)
Control	58.61 (72.50)	58.49 (72.68)	63.81 (80.56)	60.30 (75.45)
SEm±	2.21	1.93	3.62	1.60
C. D. at 5%	6.50	5.68	10.64	4.86
C. V. (%)	11.48	10.97	15.31	13.34
Y x T				
SEm±				2.6886
C. D. at 5%	-	-	-	7.6008

Note: Data given in parenthesis are retransformed values.

*Arc sine transformation

Table 1.2: Effect of fungicides on seed yield of sesame(Pooled).

Treatment	Seed yield (kg/ha)			
	2001-02	2002-03	2003-04	Pooled yield (kg/ha)
Metalaxyl + mancozeb	639	972	789	800
Mancozeb	570	824	770	721
Fosetyl- Al	611	880	7140	734
Copper oxychloride	375	708	617	567
Chlorothalonil	486	741	683	636
Bordeaux Mixture	403	676	590	556
Hexaconazole	382	486	488	452
Control	278	398	462	379
SEm±	61	61	55	30
C. D. at 5%	180	180	162	92
C. V. (%)	26.20	177.32	17.2229	16.92
Y xT				
SEm±	-	-	-	59
C. D. at 5%	-	-	-	167

Table 1.3: Economic statement of various treatment for control of phytophthora blight of sesame.

Treatment	Yield Increased over control (kg)	Gross income (Rs)	Quantity of water lit/ha	Fungicide kg or lit/ha	Expenditure(Rs)		Total Expenditure (Rs)	Net return (Rs)	CBR
					Fungicides	Labour			
1	2	3	4	5	6	7	8	9	10
Metalaxyl + mancozeb	421	15998	1500	4.155	5817	450	6267	9731	1:2.55
Mancozeb	342	12996	1500	4.000	900	450	1350	11646	9.63
Fosetyl- Al	354	13452	1500	2.820	5076	450	5526	79926	2.43
Copper oxychloride	187	7106	1500	6.000	1200	450	2900	4206	2.45
Chlorothalonil	257	9766	1500	4.000	3391	450	3842	5924	2.54
Bordeaux Mixture	177	6726	1500	15.000	705	450	1155	5571	1.58
Hexaconazole	73	2774	1500	1.500	975	450	1425	1349	11.95
Control	-	-	-	-	-	-	-	-	-

Metalaxyl + mancozeb=1400Rs Mancozeb=225 Rs

Fosetyl- Al=1800 Rs

Copper oxychloride=200 Rs

Chlorothalonil=848 Rs

Bordeaux Mixture=47 Rs

Hexaconazole =650 Rs

Sesame seeds= 38Rs/kg

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