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FUNGICIDES AGAINST SUGARCANE WILT (*FUSARIUM MONILIFORME* SHELD) UNDER POT CONDITIONS

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Effect of fungicides on sugarcane germination, wilt incidence and linear spread of infection of sugarcane wilt (*Fusarium moniliforme* Sheld) @ 1000, 1500 and 2000 ppm was studied as sett - dip treatment in pot. Carbendazin (Bavistin 50% w.p.) proved most effective in improving germination, checking the infection and spread of infection in the cane at all the three concentrations followed by organo mercurial compounds (Bagalot 6 and Emisan) @ 2000 ppm and Carbendazin (Agrozim) at 1500 and 2000 ppm concentration. While Chlorothalonil (Kavach) and Metalaxyl (Redomil-MZ) were found moderately effective in checking the wilt infection in sugarcane. This is a new and useful finding for control of sugarcane wilt disease.

Keywords : Pot condition; Sugarcane wilt control.

Introduction

Sugarcane (*Saccharum officinarum* L.; Family Gramineae) is believed to be native of New Guinea, but it is known to the people in India as sweetening agent since ancient time as there are references of sugarcane in vedas and purans[1]. It is one of the important cash crops in the world economy as it provides employment to the large number of people and contributes to the growth of rural economy. It provides raw materials for sugar, jaggery and khandesari mill[1]. Sugarcane is grown over 16.58 million hectares in the world having cane production of 967.87 million tonnes per year with average cane productivity of 58.43 T/h. and estimated sugar production of 113.2 million tonnes[2]. In India, it is grown over 3.68 million hectare with an annual cane production of 240.28 million tonne having average cane productivity of 65.3 T/h. The total sugar production of about 12.04 million tonnes and molasses about 5.54 million tonnes with 9.85% average sugar recovery is recorded. Of this nearly 40% of cane is utilized for white sugar, 12% as for seeds, feed and chewing and the rest 48% is used for khandesari sugar and gur[1].

Like other crops, sugarcane is attacked by many diseases caused by fungi, bacteria, virus, mycoplasma and nematodes infecting 10% loss of the world cropped area every year[3]. Among the diseases wilt of sugarcane caused by *Fusarium moniliforme* is one of the most important and destructive disease which causes substantial yield losses. In South Gujarat, the yield losses reported due to this dreaded disease was up to the tune of 18.96%, resulting in less sugar recovery[2].

Meterials and Methods

Different eight fungicides were tested as sett dip treatment in pot culture keeping 1000, 1500 and 2000 ppm concentration of each with three replications. Infected single eye-buded setts of susceptible cv. COC-671 were planted in autoclaved soil in surface sterilized pots after dipping for 2 hrs. in respective concentrations of the fungicides. The pots were kept in glass house providing all requirements for better growth of plants and observations were recorded on germination, wilt incidence, linear spread of infection in cane and wilt index and data were analysed.

Results and Discussion

The data presented in Table-1 and set out in Fig-3 revealed that the differences in germination and in wilt incidence among the treatments after 150 days of planting were found non significant. However, the wilt incidence was not observed in 1500 and 2000 ppm Bavistin followed by Bagalol-6, Agrozim and Emisan @ 1500 and 2000 ppm whereas, Kavach and Ridomil MZ showed moderate wilt incidence at all three

Fig. 1. Pure culture of *Fusarium moniliforme*

Fig. 2. Wilt symptoms in sugarcane

Table 1. Effect of fungicides on wilt incidence in sugarcane.

Sr. No.	Treatment	Concentation (ppm)	Germination (%)	Wilt incidence (%) (150 DAP)	Linear spread of infection	Wilt index (0 to 4)
1.	Agrozim	1000	60.00 (66.66)	45.00 (50-00)	48.30 (55.74)	1.20 (0.50)
2.	"	1500	60.00 (66.66)	45.00 (50.00)	41.56 (44.06)	1.20 (0.50)
3.	"	2000	60.00 (66.66)	45.00 (50.00)	48.27 (55.69)	1.20 (0.50)
4.	Bagalol-6	1000	60.00 (66.66)	45.00 (50-00)	75.14 (92.24)	1.57 (1.50)
5.	"	1500	60.00 (66.66)	45.00 (50.00)	72.78 (91.21)	1.41 (1.00)
6.	"	2000	60.00 (66.66)	30.00 (33.33)	65.18 (82.22)	1.41 (1.50)
7.	Bavistin	1000	90.00 (100.00)	30.00 (33.33)	35.13 (33.28)	1.00 (0.00)
8.	"	1500	90.00 (100.00)	0.00 (0.00)	36.43 (35.37)	1.33 (0.33)
9.	"	2000	90.00 (100.00)	0.00 (0.00)	0.00 (0.00)	1.00 (0.00)
10.	Dithane M-45	1000	60.00 (66.66)	45.00 (50.00)	68.99 (87.05)	1.73 (2.00)
11.	"	1500	33.00 (33.33)	90.00 (100.00)	68.91 (87.09)	1.86 (2.00)
12.	"	2000	60.00 (66.66)	90.00 (100.00)	70.68 (88.94)	1.70 (2.00)
13.	Emisan	1000	60.00 (66.66)	45.00 (50.00)	51.88 (61.79)	1.41 (1.00)
14.	"	1500	60.00 (66.66)	45.00 (50.00)	47.11 (53.61)	1.41 (1.00)
15.	"	2000	60.00 (66.66)	45.00 (50.00)	27.54 (21.50)	1.20 (1.00)
16.	Foltaf	1000	60.00 (66.66)	90.00 (100.00)	90.00 (100.00)	1.73 (2.00)
17.	"	1500	60.00 (66.66)	90.00 (100.00)	81.21 (95.46)	1.98 (3.00)
18.	"	2000	60.00 (66.66)	90.00 (100.00)	86.32 (99.19)	1.86 (3.33)
19.	Kavach	1000	60.00 (66.66)	45.00 (50.00)	55.67 (68.23)	1.57 (1.00)
20.	"	1500	60.00 (66.66)	45.00 (50.00)	63.21 (78.95)	1.70 (2.00)
21.	"	2000	60.00 (66.66)	45.00 (50.00)	72.82 (90.60)	1.57 (1.50)
22.	Ridomil-MZ	1000	60.00 (66.66)	45.00 (50.00)	70.14 (88.88)	1.86 (2.50)
23.	"	1500	60.00 (66.66)	45.00 (50.00)	70.69 (89.11)	1.73 (2.00)
24.	"	2000	60.00 (66.66)	45.00 (50.00)	77.77 (94.22)	1.73 (2.00)
25.	Control	1000	60.00 (66.66)	90.00 (100.00)	90.00 (100.00)	2.11 (3.50)
	C.D. (P=0.05)		NS	NS	11.13	0.39

Figures in parenthesis are retransformed values.

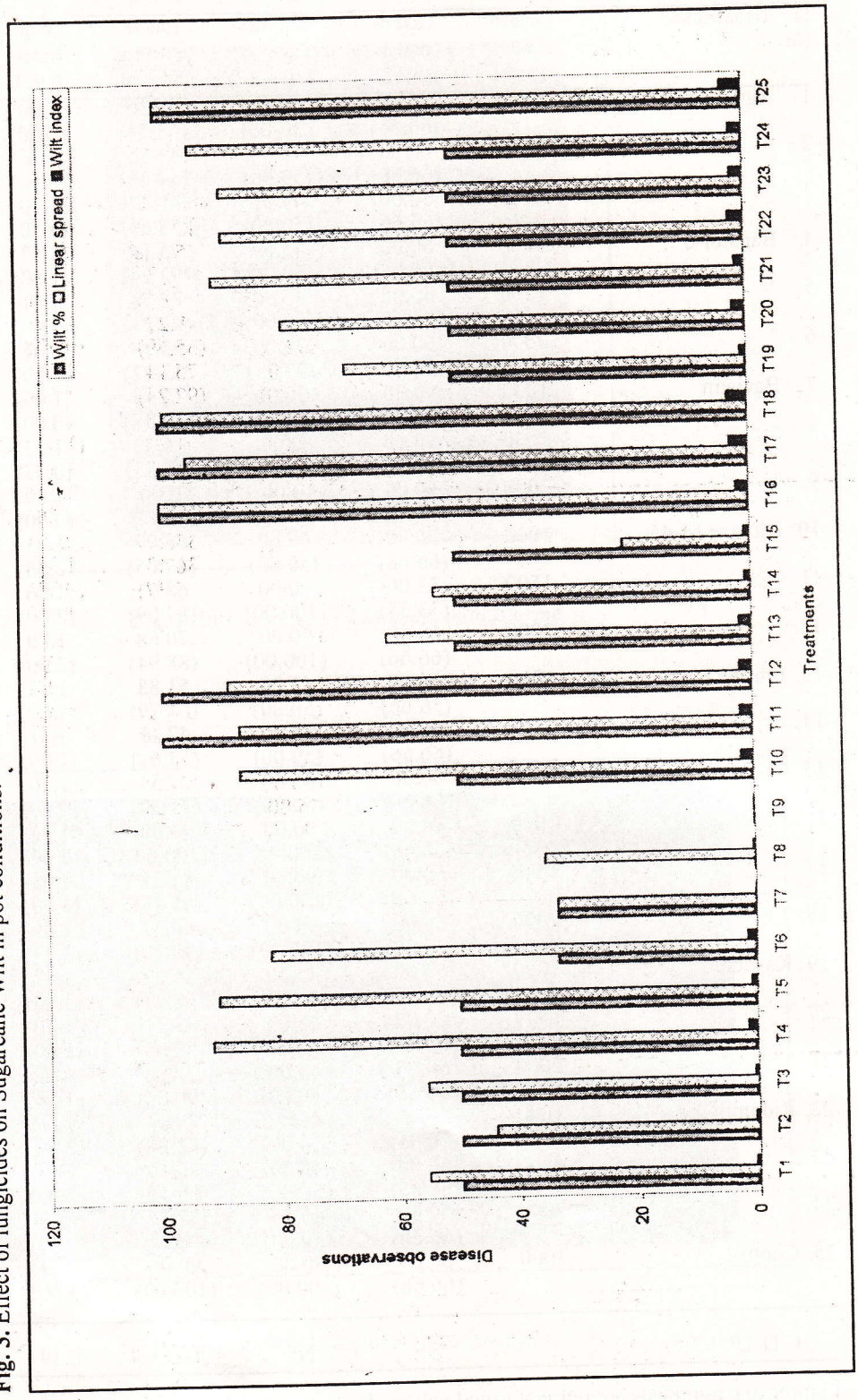

Fig. 3. Effect of fungicides on Sugarcane Wilt in pot conditions.

concentrations. The linear spread of fungus in cane was found nil in Bavistin (1500 and 2000 ppm) and found superior over all other fungicides . The wilt index was also found significantly low i.e. zero in 1500 and 2000 ppm, Bavistin followed by Bavistin (1000 ppm), Agrozim, Emisan and Bagalol-6 (1000, 1500 and 2000 ppm. respectively), while Ridomil MZ, Dithane M-45 and Foltaf had higher wilt index. Among all the fungicides Bavistin proved very effective in checking the wilt infection and spread of infection in the cane. Vidhyasekaran[4] reported efficacy of Carbendezim and Benomyl-Thrium as seed dresser (0.2%) in eradicating seed-borne infection of *F. moniliforme* in sorghum. Singh *et al.*[5], found soil amendment with Boric acid and sett treatment with Arc tan (methoxy ethyl mercury cloride) or Duter (Fentin hydroxide) followed by soil drenching with Bavistin (Carbendezim) highly effective in reducing incidence of wilt as well as population[6] of both the pathogens *F. sacchari* and *Acremonium implicatum*. Deshmukh and Patel[6] reported sett treatment with Bagalol @ 0.5% significantly effective in reducing wilt incidence and improving germination, plant height, number of canes, tiller and yield. In our study also Carbendezim (Bavistin -2000 ppm) as sett-dip treatment found very effective in controlling the sugarcane wilt followed by Bagawl-6 and Emisan @ 2000 ppm.

It can be concluded from this study that sett-dip treatment with 1500 and 2000 ppm Bavistin 5% WP (Carbendezim) proved very effective in checking the sugarcane wilt infection followed by Emisan (2000 ppm) and Agrozim (1500 and 2000 ppm). This is a new and very useful information for controlling sugarcane wilt disease.

Refereneés

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