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Efficacy of fungicides against betelvine wilt

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Abstract

The experiment on "Efficacy of fungicides against betelvine wilt" was conducted in the year 2008-10 at Betelvine Research Scheme, Oilseeds Research Station, Jalgaon under pot culture as well as field conditions. The applications of various fungicides were done by dipping of cuttings of cultivar Kapoori in respective fungicidal solution as well as soil application by drenching at bimonthly interval up to six months. The pooled data of three years revealed that application of carbendazim @ 0.2% was found significantly effective for management of *Rhizoctonia* wilt of betelvine up to six months after planting in pot culture (27.41%) as well as field condition (25.65%) while the Bordeaux mixture @ 0.4% was found next effective fungicide against *Rhizoctonia* wilt up to six months after planting in pot culture and field condition as against control which recorded 42.96 % and 28.54% incidence of *Rhizoctonia* wilt in pot culture and field condition, respectively.

Keywords: betelvine wilt, kapoori, *Rhizoctonia*, carbendazim, bordeaux mixture

Introduction

Betelvine (*Piper betel* L.) is perennial, evergreen creeper grown in shady conditions as cash crop grown commercially for leaves. Its leaves used mainly for chewing purpose as well as used in Indian system of medicine and health. It is cultivated in about 2700 ha in Maharashtra state. Betelvine is a very tender crop with succulent tissues and invariably suffers from a variety of pest and diseases. *Rhizoctonia* wilt is major causes of declining area under the crop in Maharashtra. In certain years the disease appears in such a virulent form that several of Betelvine gardens are completely wiped off leaving the cultivators to take up some other means of livelihood.

Materials and Methods

The experiment on "Efficacy of fungicides against betelvine wilt" was conducted in the year 2008-10 at Betelvine Research Scheme, Oilseeds Research Station, Jalgaon under pot culture as well as field conditions with sick soil. In pot culture, five vines per plot per treatment were used. Nine treatments along with three replications were used in Randomized block design. *In vivo* thirty vines per treatments were used. Nine treatments along with three replications were used in Randomized block design. The set treatments of respective fungicides along with three drenching at bimonthly interval first started from at the time of plantation were done.

Treatment Details

- T1- Carbendazim @0.2%
- T2- Hexaconazole @0.2%
- T3- Propiconazole @0.2%
- T4- Penconazole @0.2%
- T5- Bordeaux mixture @ 0.4%
- T6- Thiram @0.4%
- T7- Mancozeb @0.4%
- T8- *Trichoderma* spp. @12.5 kg/ha.
- T9- Control

Results & Discussion

The experiment was conducted under pot culture as well as under field conditions. The pooled data presented in Table 1.1 to 1.4 revealed that, there were significant differences among all the treatments at 2nd, 4th and 6th months after planting in respect of percent wilt incidence.

Table 1.1: Efficacy of fungicides against *Rhizoctonia* wilt of Betelvine under pot culture (Pooled data from year 2008-2010).

S. No	Treatments	Percent wilt Incidence after two months				Percent wilt Incidence after four months				Percent wilt Incidence after Six months			
		2008	2009	2010	Pooled mean	2008	2009	2010	Pooled mean	2008	2009	2010	Pooled mean
T1	Carbendazim @ 0.2%	0.00	0.00	0.00	0.00	22.22	11.11	13.33	15.55	33.33	22.22	26.67	27.41
T2	Hexaconazole @0.2%	11.11	22.22	13.33	15.55	33.33	44.44	40.00	39.26	66.66	55.55	60.00	60.74
T3	Propiconazole @0.2%	55.55	44.44	46.67	48.89	77.77	55.55	66.67	66.66	77.77	77.77	73.33	76.29
T4	Penconazole @0.2%	66.66	55.55	60.00	60.74	88.89	77.77	86.67	84.44	100.00	100.00	100.00	100.00
T5	Bordeaux mixture @ 0.4%	0.00	0.00	0.00	0.00	33.33	33.33	26.67	31.11	44.44	44.44	40.00	42.96
T6	Thiram @ 0.4%	33.33	33.33	33.33	33.33	66.66	55.55	60.00	60.74	88.89	88.89	86.67	88.15
T7	Mancozeb @0.4%	44.44	44.44	46.67	45.18	66.66	66.66	66.67	66.66	88.89	88.89	93.33	90.37
T8	<i>Trichoderma</i> spp. @12.5kg/ha	55.55	55.55	53.33	54.81	88.89	88.89	73.33	83.70	100.00	100.00	100.00	100.00
T9	Control	88.89	88.89	86.67	88.15	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	CV				9.10				9.67				3.81
	S. E. \pm				2.02				3.40				1.67
	C. D. at 5%				6.06				10.19				5.01

Table 1.2: Per cent disease control of *Rhizoctonia* wilt of Betelvine under pot culture (Pooled data from year 2008-2010).

S. No	Treatments	PDC after two months	PDC after four months	PDC after six months
T1	Carbendazim @ 0.2%	100.00	84.45	72.59
T2	Hexaconazole @0.2%	82.36	60.74	39.26
T3	Propiconazole @0.2%	44.54	33.34	23.71
T4	Penconazole @0.2%	31.09	15.56	0.00
T5	Bordeaux mixture @ 0.4%	100.00	68.89	57.04
T6	Thiram @ 0.4%	62.19	39.26	11.85
T7	Mancozeb @0.4%	48.75	33.34	9.63
T8	<i>Trichoderma</i> spp. @12.5kg/ha	37.82	16.30	0.00
T9	Control	-	-	-

Table 1.3: Efficacy of fungicides against *Rhizoctonia* wilt of Betelvine under field conditions (Pooled data from year 2008-2010).

S. No	Treatments	Percent wilt Incidence after two months				Percent wilt Incidence after four months				Percent wilt Incidence after Six months			
		2008	2009	2010	Pooled mean	2008	2009	2010	Pooled mean	2008	2009	2010	Pooled mean
T1	Carbendazim @ 0.2%	10.71	9.37	12.22	10.77	15.47	13.53	15.56	14.85	28.57	23.95	24.44	25.65
T2	Hexaconazole @0.2%	13.09	11.46	14.44	13.00	23.81	20.83	24.44	23.03	34.52	30.20	34.44	33.05
T3	Propiconazole @0.2%	44.05	38.54	43.33	41.97	47.62	43.74	50.00	47.12	57.14	54.23	57.78	56.38
T4	Penconazole @0.2%	55.95	51.03	55.56	54.18	65.48	57.29	62.22	61.66	70.24	61.45	70.00	67.23
T5	Bordeaux mixture @ 0.4%	14.29	12.33	16.67	14.43	22.62	18.58	22.22	21.14	29.76	25.87	30.00	28.54
T6	Thiram @ 0.4%	40.27	35.41	36.67	37.45	46.43	40.62	45.56	44.20	53.57	47.91	52.22	51.23
T7	Mancozeb @0.4%	30.95	26.91	31.11	29.66	38.09	35.41	38.89	37.46	57.14	51.04	57.78	55.32
T8	<i>Trichoderma</i> spp. @12.5kg/ha	47.62	41.66	46.67	45.32	58.33	51.04	57.78	55.72	64.28	56.24	67.78	62.77
T9	Control	55.95	61.45	60.00	59.13	73.81	66.66	74.44	71.64	78.57	72.91	81.11	77.53
	CV				5.62				3.22				3.53
	S. E. \pm				1.10				0.77				1.03
	C. D. at 5%				3.30				2.33				3.11

Table 1.4: Per cent disease control of *Rhizoctonia* wilt of Betelvine under field conditions (Pooled data from year 2008-2010).

Sr. No.	Treatments	PDC after two months	PDC after four months	PDC after six months
T1	Carbendazim @ 0.2%	81.79	79.27	66.92
T2	Hexaconazole @0.2%	78.01	67.85	57.37
T3	Propiconazole @0.2%	29.02	34.23	27.28
T4	Penconazole @0.2%	8.37	13.93	13.29
T5	Bordeaux mixture @ 0.4%	75.60	70.49	63.19
T6	Thiram @ 0.4%	36.66	38.30	33.92
T7	Mancozeb @0.4%	49.84	47.71	28.65
T8	<i>Trichoderma</i> spp. @12.5kg/ha	23.36	22.22	19.04
T9	Control	-	-	-

Pot Culture trial

The treatment T1 recorded the lowest wilt incidence at 2nd (0.00%), 4th (15.55%) and 6th (27.41%) months after planting followed by the treatment T5. While, the highest wilt incidence was recorded in treatment T9 followed by treatment

T4 at 2nd, 4th and 6th months after planting and T8 at 6th months after planting.

The treatment T1 recorded maximum control of betelvine wilt to the extent of 100%, 84.45% and 72.59% at 2nd, 4th and 6th months after planting respectively followed by the treatment

T5. While, treatment T4 and T8 were totally ineffective for the management of betelvine wilt at 6th months after planting.

Field Trial

The treatment T1 recorded the lowest wilt incidence at 2nd (10.77%), 4th (14.85%) and 6th (25.65%) months after planting followed by the treatment T2 at 2nd month after planting and T5 at 4th and 6th months after planting. At 2nd month after planting treatment T1 was statistically at par with treatment T2 and at 6th month after planting it was at par with treatment T5

Among all the treatments, highest wilt incidence was recorded in treatment T9 followed by treatment T4 at 2nd, 4th and 6th months after planting.

The treatment T1 recorded maximum control of betelvine wilt under field conditions to the extent of 81.79%, 79.27% and 66.92% at 2nd, 4th and 6th months after planting respectively followed by the treatment T2 at 2nd months after planting and T5 at 4th and 6th months after planting. While, treatment T4 was least effective for the management of betelvine wilt at 6th months after planting followed by treatment T8.

The set treatment at the time of planting and thereafter three drenching at bimonthly interval of Carbendazim @ 0.2% found most effective for management of *Rhizoctonia* wilt of betelvine up to six months after planting while, the Bordeaux mixture @ 0.4% was found next effective fungicide against *Rhizoctonia* wilt up to six months after planting.

Earlier workers Maithi *et al.* (1978) [3], Chattopadhyay (1967) [2], Singh and Singh (2005) [4] and Chakrabarty *et al.* (2013) [1] reported that seed treatment and soil drenching with fungicides gave better survival of cutting as compare to control. They also reported that there was reduction in wilt incidence and higher yield of betelvine due to application of carbendazim, *Trichoderma harzianum* and copper oxychloride in comparison to untreated control.

Conclusion

On the basis of above finding it can be concluded that application of carbendazim @ 0.2% was found significantly effective for management of *Rhizoctonia* wilt of betelvine up to six month after planting in pot culture (27.41%) as well as field condition (25.65%) while the Bordeaux mixture @ 0.4% was found next effective fungicide against *Rhizoctonia* wilt up to six months after planting in pot culture and field condition as against control which recorded 42.96 % and 28.54 % incidence of *Rhizoctonia* wilt in pot culture and field condition, respectively.

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