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Evaluation of Propamocarb 530 + Fosetyl 310-840 SL for the management of damping off of vegetables

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Abstract

Damping-off is a disease that leads to the decay of germinating seeds and young seedlings, which represents for farmers one of the most important yield constraints both in nurseries and fields. As for other biotic stresses, conventional fungicides are widely used to manage this disease hence, a field experiment was conducted in the College of Horticulture, Hiriyyur during year 2010-11 and 2011-12, for the management of damping off of tomato, chilli and cabbage vegetable crops. The results revealed that all the treatments significantly reduced the damping off incidence in nursery over untreated control. The pooled data indicated that per cent disease incidence was significantly lowest in all the treatments over the control. The PDI was lower Propamocarb 530 + Fosetyl 310-840 SL @ 3.0 g/lit (6.99, 5.85 and 7.37 PDI) which was followed by Propamocarb 530 + Fosetyl 310-840 SL @ 2.5 g/lit and 2.0 g/lit in Tomato, chilli and cabbage respectively.

Keywords: Tomato, chilli, cabbage, previcur energy and vegetables

Introduction

In vegetables crops Tomato (*Lycopersicon esculentum* Miller), Chilli (*Capsicum annum* L.) and Cabbage are the major crops. Although India has a large growing area, their productivity is relatively low when compared to other countries. The prominent reason for this is the high incidence of fungal and viral diseases. Of these, Damping off is one of the most dreadful diseases and is particularly severe in densely crowded nurseries and it cause reduced germination percentage, vigour, quality and yield of crops. Excess of moisture, lack of sunlight, growing of nursery in heavy soils and presence of weeds favour the development of this disease. In the nursery, the disease starts in patches and in due course spreads to the entire lot. Damping-off incited by *Pythium* species alone caused more than 60 per cent death of seedlings in both nurseries and main field (Manoranjitham and Prakasam 2000; Jadhav and Ambadkar 2007) [3, 1].

It also causes seedling rots, root rot, cottony-leak, cottony blight, stalk rot etc. It is known to cause infection on a wide range of plant species, belonging to different families viz., Amaranthaceae, Amaryllidaceae, Araceae, Basellaceae, Bromeliaceae, Cactaceae, Chenopodiaceae, Compositae, Coniferae, Convolvulaceae, Cruciferae, Cucurbitaceae, Euphorbiaceae, Gramineae, Leguminosae, Linaceae, Malvaceae, Moraceae, Passifloraceae, Rosaceae, Solanaceae, Umbelliferae, Violaceae, Vitaceae, Zingiberaceae (Waterhouse and Waterston 1964) [7]. Once established, damping-off pathogens are able to survive for many years in the soil, even in the absence of host plants, either as saprophytes or as living resting structures that are capable of enduring adverse conditions (Menzies, 1963) [4]. Their wide host range also aids in the longevity of these fungi and fungus-like organisms.

Material and methods

A field experiment on bio efficacy Propamocarb 530 + Fosetyl 310-840 SL (Previcur energy 840 SL) against Damping off of tomato, chilli and cabbage in nursery bed, were conducted at College of Horticulture, Hiriyyur during 2010-11 and 2011-12. The experiments consisted of seven treatments viz., untreated check, Propamocarb 530 + Fosetyl 310-840 SL (2.0, 2.5 and 3.0 g/ litre), Previcur (2.2 g/ litre), Fosetyl (1.5g/lit) and Ridomil MZ (standard check 3.0g) and was laid-out in Randomized Block Design with four replication. Susceptible varieties were used in the present investigations. The varieties were grown as per packages of practices for higher yields. Treatments were imposed at beginning of the disease appearance. Observations on number of damped off seedling were recorded and statistically analysed.

Per cent disease incidence was calculated as per below formula.

$$\text{Per cent disease incidence (PDI)} = \frac{\text{Number of damped off seedling}}{\text{Total number of seedling}} \times 100$$

The Per cent germination, pre and post emergence mortality were recorded for screening of vegetables (Tomato) cultivars/genotypes and disease reaction was graded as rating scale adopted by Saleem *et al.* (1999) [6].

Reaction	Infection range (Per cent)
Immune (I)	00
Highly Resistant (HR)	1 – 5
Moderately Resistant (MR)	6 – 10
Moderately Susceptible (MS)	11 – 25
Susceptible (S)	26 – 50
Highly Susceptible (HS)	51 and above

Results and Discussion

A field experiment was carried out in the Randomized Block Design with four replications and seven treatments. Results (Table 1, 2 and 3) revealed that the two years pooled data of per cent disease incidence of damping off of differed significantly among the treatments. Per cent disease incidence of damping-off was significantly reduced in all the treatments over control. It was significantly lower in Propamocarb 530 + Fosetyl 310-840 SL @ 3.0 g/lit has recorded lowest PDI in chilli, tomato and cabbage (7.33, 6.33 and 8.16 PDI, respectively) as compared to the rest, which was followed by Propamocarb 530 + Fosetyl 310-840 SL at 2.5 g/lit showed 8.66, 7.58 and 9.41 PDI and Propamocarb 530 + Fosetyl 310-840 SL at 2.0 g/lit was recorded 10.41, 9.0 and 10.75 PDI in chilli, tomato and cabbage, respectively. The highest PDI was observed in untreated check

(31.33, 33.66 and 33.60 PDI) which was followed by fosetyl at 1.5 g/lit (15.75, 17.91 and 17.41 PDI) in chilli, tomato and cabbage. During second year spray, there were no much significant differences among the treatments imposed with respect to the reduction of damping off compare to the first season. The PDI was lower Propamocarb 530 + Fosetyl 310-840 SL @ 3.0 g/lit has recorded 7.33, 6.33 and 8.16 PDI in chilli, tomato and cabbage respectively which was followed by Propamocarb 530 + Fosetyl 310-840 SL @ 2.5g/lit (8.16, 7.08 and 8.25 PDI) and Propamocarb 530 + Fosetyl 310-840 SL @ 2.0 g/lit (8.41, 9.16 and 10.50 PDI) in tomato, chilli and cabbage, respectively. The highest per cent

The pooled data indicated that per cent disease incidence was significantly lowest in all the treatments over the control. The PDI was lower Propamocarb 530 + Fosetyl 310-840 SL @ 3.0 g/lit (6.99, 5.85 and 7.37 PDI) which was followed by Propamocarb 530 + Fosetyl 310-840 SL @ 2.5 g/lit and 2.0 g/lit in Tomato, chilli and cabbage.

The results are in agreement with several workers who reported damping off management in various crops through fungicides. Palakshappa *et al.* (2010) [5] reported that Metalaxyl + Mancozeb (64 %) at all concentrations were found effective and recorded low seedling death due to chilli damping off caused by *P. aphanidermatum*. Mani and Marimuthu (1994) [2] reported copper oxchloride as most effective fungicide and reduced the seedling death due to damping off of chilli. The results obtained brought new information an use of combi product viz., Propamocarb 530 + Fosetyl 310-840 SL compound for the management of damping off of vegetables.

Table 1: Evaluation of Propamocarb 530 + Fosetyl 310-840 SL (Previcur energy 840 SL) against Damping –off of chilli seedlings in nursery bed

S. No.	Treatments detail	Concentration	PDI for Chilli		
			2010-11	2011-12	Pooled data for 2 years
1	Untreated	-	31.33 (34.00)	35.00 (36.25)	33.16 (63.12)
2	Previcur energy	0.2	10.41 (18.82)	10.41 (18.82)	10.41 (18.41)
3	Previcur energy	0.25	8.66 (17.11)	8.16 (16.59)	8.41 (16.85)
4	Previcur energy	0.3	7.33 (15.69)	6.66 (14.94)	6.99 (15.31)
5	Previcur	0.22	11.0 (19.36)	11.41 (19.73)	11.20 (19.54)
6	Fosetyl	0.15	15.75 (23.38)	17.50 (24.72)	16.62 (24.05)
7	Ridomil MZ	0.2	13.25 (21.33)	15.33 (23.05)	14.29 (22.19)
	S.EM±		0.53	0.57	0.55
	CD at 5%		1.66	1.77	1.71

Table 2: Evaluation of Propamocarb 530 + Fosetyl 310-840 SL (Previcur energy 840 SL) against Damping –off of tomato seedlings in nursery bed

S. No.	Treatment detail	Concentration	PDI for tomato		
			2010-11	2011-12	Pooled data for 2 years
1	Untreated	-	33.66 (35.45)	35.33 (36.46)	34.49 (35.95)
2	Previcur energy	0.2	9.0 (17.45)	9.16 (17.62)	9.08 (17.53)
3	Previcur energy	0.25	7.58 (15.98)	7.08 (15.42)	7.33 (15.70)
4	Previcur energy	0.3	6.33 (14.55)	5.33 (13.33)	5.83 (13.94)
5	Previcur	0.22	10.91 (19.29)	11.33 (19.66)	11.12 (19.47)
6	Fosetyl	0.15	17.91 (25.03)	17.85 (24.90)	17.83 (24.96)
7	Ridomil MZ	0.2	13.91 (21.09)	13.83 (21.81)	13.87 (21.45)
	S.EM±		0.41	0.64	0.52
	CD at 5%		1.27	1.97	1.62

Table 3: Evaluation of Propamocarb 530 + Fosetyl 310-840 SL (Previcur energy 840 SL) against Damping –off of cabbage seedlings in nursery bed

S. No.	Treatment detail	Concentration	PDI for cabbage		
			2010-11	2011-12	Pooled data for 2 years
1	Untreated	-	33.60 (35.46)	33.33 (35.25)	33.49 (35.35)
2	Previcur energy	0.2	10.75 (19.13)	10.50 (18.90)	10.62 (19.01)
3	Previcur energy	0.25	9.41 (17.86)	8.25 (16.68)	8.83 (17.27)
4	Previcur energy	0.3	8.16 (16.60)	6.58 (14.85)	7.37 (15.72)
5	Previcur	0.22	15.16 (22.90)	14.33 (22.24)	14.74 (22.57)
6	Fosetyl	0.15	17.41 (24.66)	17.5 (24.72)	17.45 (24.69)
7	Ridomil MZ	0.2	13.66 (21.68)	13.58 (21.62)	13.62 (21.65)
	S.EM±		0.31	0.43	0.37
	CD at 5%		0.95	1.32	1.13

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