Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 2268-2270
Received: 26-01-2020
Accepted: 29-02-2020

Vivekanand Uraiha
Department of Plant Pathology, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Tamin Thakur
Department of Plant Pathology, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

KN Koshale
Department of Plant Pathology, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

CP Khare
Department of Plant Pathology, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Megha Thakur
Department of Plant Pathology, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Corresponding Author:
Vivekanand Uraiha
Department of Plant Pathology, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Effect various treatment of bottle gourd (*lagenaria siceraria*) against Downey mildew under field conditions

Vivekanand Uraiha, Tamin Thakur, KN Koshale, CP Khare and Megha Thakur

Abstract
Pseudoperonospora cubensis, the causal agent of bottle gourd downy mildew. Downy mildew was appeared during the course of investigation. The occurrence of downy mildew was first observed from second fortnight of December 2017 gradually increased during the crop period. The seeds treated with chemical *i.e.* carbendazim 12% + mancozeb 63% (3g/kg seed) considerably increased germination percentage (93.33%), root length (9.14cm), shoots length (13.11 cm), fresh weight (5.67 g), dry weight (0.66 g) and vigour index (2183.65). The minimum days to first flowering (40 DAS), fifty per cent flowering (45 DAS) and first fruiting (43 DAS). and maximum days to fruit length (37.87 cm) and girth (15.43 cm), Seed treatment with seed pro @ 25g/kg + drenching at first true leaf stage with seed pro @ 5% + spray of (imidacloprid 17.8 SL @ 7.5 ml/15L + neem oil 0.2%) + (tebuconazole 50% + trifloxistrobin 25% WG @ 1g/l) + Fosetyl-Al @ 0.1%.

Keywords: bottle gourd, disease, downy mildew

Introduction
The bottle gourd (*Lagenaria siceraria* Standl., F: Cucurbitaceae), is a tropical vegetable of Afro-Asian origin and is cultivated in India throughout the year for its young and tender fruits eaten as popular domestic vegetable called 'Lauki'or 'Dudhi'.Medicinal uses bottle gourd is traditionally used as a cardio-tonic, aphrodisiac and general tonic, liver tonic, anti-inflammatory, expectorant and diuretic agent (Deshpande, *et al.* 2008) [7]. The fruit of bottle gourd is also reported to have good source of Vitamin-B complex and choline along with fair source of vitamin-C and β-carotene (Kirtikar and Basu, 2001) [9]. The serious diseases like downy mildew. Downy mildew caused by *Pseudoperonospora cubensis* is one of the important foliar diseases of bottle gourd. It was reported for the first time in 1868 and still it is considered as one of the serious problem. In India, it is present all over the country except in high altitude temperate zone in the Himalaya. Symptoms first appear as pale green areas on the upper leaf surfaces. These change to yellow angular spots. A fine white to grayish downy growth soon appears on the lower leaf surface. Infected leaves generally die but may remain erect while the edges of the leaf blades curl inward.

Beura *et al.* (2014) [3-4] conducted an experiment to test the different integrated approaches for management of bitter gourd along with bower system and non bower system. Four years pooled data revealed that all the treatments of bower system of planting lowered the disease severity as compared to non-bower system of planting.

Among the fourteen treatments tested, integrated disease management components like seed treatment with ridomil mz (metalaxyl 8% + mancozeb 64%) @ 0.25% + three times removal of lower infected leaves in the morning and spray of mancozeb 75% @ 0.25% in the afternoon on bower system recorded significantly lowest disease severity of downy mildew (4.7%) with maximum fruit yield of 90.2 q ha^{-1}. The same treatment also registered 92.24% disease control over control plots followed by seed treatment with ridomilmz (metalaxyl 8% + mancozeb 64%) @ 0.25% along with one foliar spray of alliete (fosetyl-al) @ 0.25% on bower system of planting registered 79.87% disease control. However, the check plot recorded the maximum disease severity of 60.60% and 46.60% with minimum green fruit yield of 33.50% q ha^{-1} and 41.1 q ha^{-1} in non-bower and bower system of planting respectively.

Narkhede *et al.* (2014) [13] suggested that fortnight spray of Carbendazim (0.1%), Calixin (0.05%), Karathane (0.5%) and Sulfex (0.2%) have been found effective.

Seed treatment and seed drenching with systemic fungicides also gave protection to young seedlings from powdery mildew. Downy mildew can be effectively controlled by spray of Dithane M45 (0.2%), Daconil and Difolatan (0.2%). One spray gave protection for nine days. Copper oxychloride spray also gave good control. The sprays of Dithane M 45 if given early and repeated 2-3 times can effectively control the disease.

Materials and Methods

Seven different treatment combinations were evaluated against Downey mildew of Varad variety is bottle gourd to find out best management combinations under organic condition at Horticultural Research Farm, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh.

Experimental details

1. Experimental site: Horticultural farm
2. Experimental design: RBD
3. Number of treatments: 7
4. Number of replication: 3
5. Plot size: 7.5 × 4 m
6. No. of plants per plot: 4 × 5 = 20
7. Spacing row to row: 1 × 1 m
8. Plant to plant: 1.5 × 1.5 m

T1 +T0

1. Seed treatment Seed pro 2.5 g/kg
2. Drenching with Seed pro @ 5%
3. First, Third and Fifth spray of Seed Pro (1%)
4. Second, Fourth and Sixth spray of Neem Oil (0.2%

T2 +T0

1. Seed treatment Carbendazim 12%+ mancozeb 63% @3 g/kg
2. Drenching with Captan 70% + Hexaconazole 5%WP @ 0.1%
3. First, Third and Fifth spray of Seed Pro (1%)
4. Second, Fourth and Sixth spray of Neem Oil (0.2%)

T3+T0

1**.** Seed treatment Seed pro 2.5 g/kg
2. Drenching with Seed pro @ 5%
3. First and fourth spray of Captan 70% + Hexaconazole 5%WP @ 0.1%
4. Second and Fifth (Imidacloprid 17.8 SL @7.5ml/15 L + Neem oil 0.2%)
5.Third and Sixth spray of Fosetyl-Al 0.1%.

T4+T0

1. Seed treatment Seed pro 2.5 g/kg
2. Drenching with Seed pro @ 5%
3. First and Fifth (Imidacloprid 17.8 SL @7.5ml/15 L + Neem oil 0.2%)
4. Second and fourth spray of Tebuconazole 50%+Trifloxystrobin 25%WG @1g/l
5. Third and Sixth spray of Fosetyl-Al 0.1%

T5+T0

1. Seed treatment Carbendazim 12%+ mancozeb 63% @3 g/kg
2. Drenching with Captan 70% + Hexaconazole 5%WP @ 0.1%
3. First and fourth spray of Tebuconazole 50%+Trifloxystrobin 25%WG @1g/l
4. Second and Fifth (Imidacloprid 17.8 SL @7.5ml/15 L + Neem oil 0.2%)
5. Third and Sixth spray of Fosetyl-Al 0.1%

T6 +T0

1. Seed treatment Carbendazim 12%+ mancozeb 63% @3 g/kg
2. Drenching with Captan 70% + Hexaconazole 5%WP @ 0.1%
3**.** First and Fifth (Imidacloprid 17.8 SL @7.5ml/15 L + Neem oil 0.2%)
4. Second and fourth spray of Captan 70% + Hexaconazole 5%WP @ 0.1%
5. Third and Sixth spray of Fosetyl-Al 0.1%.

T7 +T0 Control

*** All the spray will be done at 10 days interval.**

The data on per cent disease index (downy mildew) and percent disease infection (mosaic and leaf curl)were recorded after 30, 60 and 90 after transplanting last observation was considered for evaluation of bitter gourd varieties. Per cent disease index (PDI) was calculated by using the following formula proposed by Singh *et al*. (1996),

$$\text{Per cent disease index} = \frac{\text{Sum of individual ratings}}{\text{No. of plants observed} \times \text{Maximum disease grade}} \times 100$$

All varieties were evaluated based on the following scale with some modifications.

Table 1: Shows the Grade of rating Reaction and Disease intensity (%)

Grade of rating	Reaction	Disease intensity (%)
0	Immune	0
1	Resistant	0.10 – 15.0
2	Moderately resistant	15.1 – 25.0
3	Moderately susceptible	25.1 – 50.0
4	Susceptible	50.1 – 75.0
5	Highly susceptible	>75

Result and Discussion

Germination parameter of bottle gourd seed with effect of different seed treatment.

Table 2: Shows the Seedling parameters Bio control Chemical and Untreated

Seedling parameters	Bio control	Chemical	Untreated
Germination (%)	96.29	98.14	93
Root length (cm)	6.55	9.14	5.8
Shoot length (cm)	9.15	13.11	7.12
Fresh weight (g)	3	5.67	2.02
Dry weight (g)	0.51	0.66	0.41
Vigour index	1511.75	2183.65	1201.56

- The minimum days to first flowering was recorded under treatment T_6 (40 DAS). This was followed by T_3 Maximum number of days to first flowering was recorded in control (45 DAT).
- The minimum days to fifty per cent flowering was recorded under treatment T6 (44 DAS). This was followed by T3. Maximum number of days to fifty per cent flowering was recorded in control (48 DAS).

- The minimum days to first fruiting was recorded under treatment T6 (43 DAS) this was followed by T3 an maximum number of days to first fruiting was recorded in control (47 DAS).

The best method of management of Downey mildew is found in T6 treatment combination. This is best germination, and vigour parameter, low disease incidence early flowering and fruiting. This is followed by biological control and Maximum disease incidence reported in control treatment.

Table 3: Shows the Treatment and PDI or Per Cent Infection (90 DAT

Treatment	PDI or Per Cent Infection (90 DAT
T1	35
T2	25
T3	33.33
T4	26.66
T5	25
T6	23.59
T7	45

References

1. Anand N, Devappa V, Pitchaimuthu M, Fhakrudin B, Lingaiah HB, Anjanappa M *et al*. Selection parameters for downy mildew disease, fruit yield and related traits in ridge gourd [*Luffa acutangula (Roxb.)* L.]. Electronic Journal of Plant Breeding. 2017; 8(2):601-608.
2. Berkeley MS, Curtis A. *Peronospora cubensis.* J Linn. Soc. Bot. 1868; 10:363.
3. Beura SK, Sarkar S, Nandi A, Senapati N. Effect of different integrated disease management components against downy mildew of bitter gourd. Journal of Mycological Research. 2014; 52(2):359-361.
4. Beura SK, Sarkar S, Nandi A, Senapati N. Effect of different integrated disease management components against downy mildew of bitter guard. J Mycopathol. Res. 2014; 52(2):359-361.
5. Call AD, Criswell AD, Wehner TC, Ando K, Grumet R. Resistance of cucumber cultivars to a new strain of cucurbit downy mildew. Horticultural Science. 2012; 47(2):171-178.
6. Cohen Y, Meron I, Mor N, Zuriel S. A new pathotype of *Pseudoperonospora cubensis* causing downy mildew in cucurbits in Israel. Phytoparasitica. 2003; 31(5):458-466.
7. Deshpande JR, Choudhari AA, Mishra MR, Meghre VS, Wadodkar SG, Dorle AK. Beneficial effects of *Lagenaria siceraria* fruit epicarp in animal models. Indian J of Experimental Biology. 2008; 46:234-242.
8. Grabowski M. Downy mildew of cucurbits. University of Minnesota Extension, 2016.
9. Kirtikar KR, Basu BD. India Medicinal Plants Ed. 2nd, Orccutil Enterprises, Dehradun, 2001.
10. Kumar Amrotin V, Khare CP. Response of Bitter Gourd Varieties against Multi-disease Resistance. Trends in Biosciences. 2016; 11(5):671-675.
11. Lebeda A, Cohen Y. Cucurbit downy mildew *(Pseudoperonospora cubensis):* biology, ecology, epidemiology, host-pathogen interaction and control. Eur. J Plant Pathol. 2011; 129:157-192.
12. Lebeda A, Cohen Y. Cucurbit downy mildew (*Pseudoperonosporacubensis)*—biology, ecology, epidemiology, host-pathogen interaction and control. European journal of plant pathology. 2011; 129(2):57-192.
13. Narkhede GW, Gopal GR, Deshmukh SB. Improved cultivation of bitter gourd. Popular Kheti, 2(4), 2-6.
14. Savory EA, Granke LL, Quesada- Ocampo LM, Varbanova M, Hausbeck MK, Day B. The cucurbit downy mildew pathogen *Pseudoperonospora cubensis*. Molecular plant pathology. 2011; 12(3):217-226.