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Management of *Cercospora* leaf spot in bottle gourd by integrated means under semi-arid conditions in Rajasthan

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Abstract

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl] is a commonly grown vegetable crop in India, which is also grown in Ethiopia, Africa, Central America and other warmer regions of the world. It is widely grown on open fields as well as in river beds throughout the year. It is also suitable for cultivation in hot dry areas. The fruits can be used for juice, as a vegetable or for making sweets. As a vegetable, it is easily digestible, even by patients. *Cercospora* Leaf spot found to cause serious losses in bottle guard crop throughout Rajasthan and other states. Characteristic symptoms are small gray or white irregular spots with black margin; the centers of these leaf spots are light brown. The field trial was conducted during *Kharif* season of 2015 to 2018 at RARI, Durgapura for the integrated disease management of *Cercospora* Leaf spot in bottle gourd through different means and combinations among seven treatments. The minimum disease incidence (12.39%) and maximum yield (338.5 q/ha) were observed in treatment T₅ (T₀+ Seed treatment with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70% +Hexaconazole 5% WP @ 0.1% 15 days after germination followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-Al @ 0.1% followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-Al @ 0.1% at 10 days interval) while maximum disease incidence (37.15%) and minimum yield (225.7 q/ha) were observed in treatment T₇ (Control).

Keywords: *Cercospora*, bottle gourd, semi-arid, conditions

Introduction

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl] is a commonly grown vegetable crop in India, which is also grown in Ethiopia, Africa, Central America and other warmer regions of the world. It is widely grown on open fields as well as in river beds throughout the year. It is also suitable for cultivation in hot dry areas. The fruits can be used as a vegetable or for making sweets. As a vegetable, it is easily digestible, even by patients (Thamburaj and Singh, 2000) ^[4]. It is gaining importance due to its high yield potential, steady market price throughout the season. The fruits contain 0.2% protein, 2.9% carbohydrates, 0.5% fat and 11 mg of vitamin C per 100 g fresh weight (Aykroyd, 1963) ^[1]. It also has wide medicinal properties such as laxative, digestive and to prevent constipation. The crop is attacked by a number of diseases such as, *Cercospora* leaf spot, *Alternaria* leaf blight, powdery mildew, downy mildew and anthracnose, amongst which *Cercospora* leaf spot caused by *Cercospora citrullina* is found to cause serious losses throughout Rajasthan and other states. Characteristic symptoms are small gray or white irregular spots with black margin; the centers of these leaf spots are light brown. So far, information available on disease management of *Cercospora* leaf spot of bottle gourd under hot arid condition is scanty. Keeping in view, the present study was undertaken to aware the management of *Cercospora* leaf spot of bottle gourd in under semi-arid conditions in Rajasthan.

Materials & Methods

The field trials were conducted during rainy season of 2015 to 2018 at Rajasthan Agricultural Research Institute, Durgapura, Jaipur in vegetable block. A bottle gourd variety Pusa Naveen was sown on *Kharif* in all years in the field in Randomized Block Design with three replications for integrated management of *Cercospora* leaf spot of bottle gourd through botanical, fungicides, insecticide and their different combinations. Seven treatments such as T₀: Growing of two rows of maize as border crops and use of agri silver mulch sheet. T₁: T₀ + Seed treatment with Seed Pro @ 25 g/kg and soil drenching of Seed Pro @ 5% at 1st true leaf

stage after germination followed by 5-6 spray of Seed Pro (1%) at 10 day interval in rotation with Neem oil (0.2%) alternatively after 15 days after drenching, T₂: T₀ + Seed treatment with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70% +Hexaconazole 5% WP @ 0.1% at 1st true leaf stage after germination followed by 5-6 spraying of Seed Pro (1%) at 10 day interval in rotation with Neem oil (0.2%) alternatively after 15 days after drenching, T₃: T₀ + Seed treatment with Seed Pro @ 25 g/kg and soil drenching of Seed Pro @ 5% 1st true leaf stage after germination followed by spraying of Captan 70% + Hexaconazole 5% WP @ 0.1% followed by spraying of (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% followed by Captan 70% + Hexaconazole 5% WP @ 0.1% followed by spraying of (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 10 days interval, T₄: T₀ + Seed treatment with Seed Pro @ 25 g/kg and soil drenching of Seed Pro @ 5% at 1st true leaf stage after germination followed by spray of (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by spray of Tebuconazole 50% + Trifloxystrobin 25% @1g/l followed by Fosetyl-AI @ 0.1%, followed by spray of Tebuconazole 50% + Trifloxystrobin 25% @1g/l followed by spray of (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 10 days interval T₅: T₀ + Seed treatment with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70% +Hexaconazole 5% WP @ 0.1% 15 days after germination followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 10 days interval, T₆: T₀ + Seed treatment with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70 % +Hexaconazole 5% WP @ 0.1% 15 days after germination followed by spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by spraying of Captan 70% +Hexaconazole 5% WP @ 0.1% followed by spraying of Captan 70% +Hexaconazole 5% WP @ 0.1% + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 30 days after drenching and T₇: Control were taken for this study. Seed treatment (ST) was done before sowing of bottle gourd crop.

Cercospora Leaf spot was observed in the field during both the years. Isolation was made in the laboratory. Small bits with typical disease symptoms of infected leaves along with healthy tissues were cut with the help of sterile blade, surface sterilized with 0.1% mercuric chloride for 30 seconds followed by three washing with sterilized water and plated aseptically in the Petri plates containing 2% Potato Dextrose Agar (PDA) Medium and incubated at 25±1 °C for seven days. Pathogenicity was established on healthy plants of bottle gourd variety 'Pusa Naveen'. The per cent data were angular transformed and statistically analyzed in RBD.

Results and Discussion

Data on disease incidence of *Cercospora* leaf spot are presented in table 1. All the treatments were found superior than control in case of disease incidence. *Cercospora* leaf spot was found with ranging from 12.39 to 37.15 disease incidence. Among 7 treatments, minimum disease incidence was observed in treatment T₅ (12.39): (T₀ + Seed treatment

with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70% +Hexaconazole 5% WP @ 0.1% 15 days after germination followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 10 days intervals) with maximum yield (338.5 Q/ha). Treatment T₅ and T₄ are statistically at per each other.

The next best treatments was observed T₆ (T₀ + Seed treatment with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70% +Hexaconazole 5% WP @ 0.1% 15 days after germination followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 10 days interval.) with yield(324.8 Q/ha) and maximum disease incidence was observed in treatment T₇ (37.15) with minimum Yield (225.7 Q/ha). Dushyant *et al.*, (2014) ^[3] found in the field that carbendazim + mancozeb was the most effective treatment for management of early blight of tomato (*Alternaria solani*) with the minimum disease severity of 8.2%, followed by mancozeb and iprodione + carbendazim with disease severity of 11.4% and 15.2%, respectively. Maheshwari *et al.* (2017) ^[5] also reported that combined treatment of carbendazim (Seed treatment) @ 0.1% + mancozeb (Foliar spray) @ 0.25% + *Pseudomonas fluorescens* (Foliar spray) @ 5.0% + neem leaf extract (Foliar spray) @ 5.0% was found the most effective with minimum disease incidence of 9.25%, minimum disease severity of 7.07% and maximum disease control (78.23%) and Devappa *et al.* (2016) ^[2] reported that management of *Alternaria and Cercospora* leaf spot disease of chilli, lowest percent disease index was observed in combination spray of Tilt 25% EC @ 0.05% + Eucalyptus Spp@10% + *Pseudomonas fluorescens* @5g/lt.

Conclusion

It is concluded that *Cercospora* is a destructive pathogen causing a widespread destruction in vegetables but it becomes easier to control this cosmopolitan fungus. Keeping in mind, it is advisable to the growers to manage *Cercospora* leaf spot disease of bottle gourd by adopting management measures of combine treatments (T₀+ Seed treatment with carbendazim 12%+ mancozeb 63% @ 3 g/kg and drenching of Captan 70% +Hexaconazole 5% WP @ 0.1% 15 days after germination followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% followed by spraying of Tebuconazole 50% + Trifloxystrobin 25% @1g/l + spray with (Imidacloprid 17.8 SL @ 7.5 ml/ 15 l + Neem oil 0.2%) followed by Fosetyl-AI @ 0.1% at 10 days interval) This disease may attains an alarming status and may wreak havoc in bottle gourd growing areas if not taken care well in time. Therefore, it is need of the hour to know effective management strategy against this dreaded disease of the crop.

Table 1: Integrated Disease Management of *Cercospora* Leaf spot for Bottle gourd

Treatments	PDI (<i>Cercospora</i> Leaf spot) (ϕ)	Yield Q/ha,
T1	14.11(22.05)	276.2
T2	12.67(20.82)	285.5
T3	8.68(17.11)	310.4
T4	9.83(18.26)	301.3
T5	4.66(12.39)	338.5
T6	6.50(14.73)	324.8
T7	36.50(37.15)	225.7
SEM \pm	0.41	32.16
CD 5%	1.163	11.29

References

1. Aykroyd WR. The Nutritive value of Indian Foods and Planning of satisfactory diet. ICMR Special Rep. Series No. 42, 1963.
2. Devappa V, Thejakumar MB. Integrated Management of Chilli leaf spot Caused by *Alternaria alternata* and *Cercospora capsici* under field condition, 2016.
3. Dushyant Khatri NK, Prasad J, Maheshwari SK. Efficacy of fungicides against early blight of tomato caused by *Alternaria solani*. Annals Plant Protect. Sci. 2014; 22(1):148-151.
4. Thamburaj S, Singh N. Textbook of Vegetables, Tuber crops and Spices. Published by DIPA, ICAR, and New Delhi, 2000, 469.
5. Maheshwari SK, Choudhary BR, Sarma BD, Saroj PL. Management of *Alternaria* Leaf Blight of Bottle Gourdin Western Rajasthan, India Int. J Curr. Microbiology. App. Sci. 2017; 6(6):1272-1277