SHORT COMMUNICATION

IMPACT OF DIFFERENT FUNGICIDE, BOTANICALS AND BIO CONTROL AGENTS ON YIELD LOSS CAUSED BY CHILLI FRUIT ROT

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Abstract: The presented experiment was conducted at Dr. B. R. AmbedkarSamajikVigyan Kendra Bordhi, Rehti, BRAUSS, Dr. Ambedkar Nagar in the *rabi* season 2019-20 and 2020-21. The field experiment was laid down in randomized block design with eight treatment and three replication. The eight treatment viz. Treatment T_1 (Sulphur 80% WP), T_2 (Azxystrobin 11 + Tebuconazole 18.3% WP), T_3 (Azxystrobin 18.2 + Difenoconazole 11.4% SC), T_4 (Tebuconazole 25% WG), T_5 (TrichodermaViride 1% WP) T_6 (Eucalyptus oil) T_7 (Neem oil) and T_8 (control) were evaluated. During the evaluation of the data in both year the yield loss per cent was ranges from 8.18% to 12.94%. The minimum average yield loss per cent war recorded in the treatment T_2 (8.18%) followed by the treatment T_1 (9.45%), T_3 (8.33%), T_4 (9.03%) and T_5 (8.55%). Overall treatment T_2 (Azxystrobin 11 + Tebuconazole 18.3% WP) performed very well during the experiment.

Keywords: Yield loss, Botanicals bio control and fungicide

INTRODUCTION

Chilli is vernacularly known as hot pepper, "Mirchi". It occupies an important place in daily diet and can be used in a variety of ways. Chilli fruits are used for preparation of vegetable mix pickles, sauces, ketchup, essence, oleoresins and is an inevitable ingredient in Indian dishes. Chilli is a good source of capsicin, vitamin A, vitamin C, riboflavin and thiamine. It contains about 8.8gram carbohydrates, 5.3gram sugar, 1.9gram protein and 534 micro gram beta carotene per 100gram chilli (Panda *et al.*, 2010). These properties increase the demand for chillies all over the world.

Chilli (*Capsicum annum* L.) is a prominent summer vegetable crop belonging to the family solanaceae. It is an important vegetable, spice as well as cash crop of Madhya Pradesh which gives good returns to the farmers. It is cultivated in tropical and sub-tropical climates, at up to 2,000m attitudes. The most ideal climatic conditions for chilli cultivation are 20-25 ^{0}C temperature and about 850- 1200 mm per annum rain fall.

In india Andhra Pradesh is leading producer of chilli followed by Telangana, Maharashtra, Karnataka, Madhya Pradesh.In the Madhya Pradesh, actual chilli production is around 2.18 lakh tonnes which included 54500 tons or 25 per cent from five district in Nimar region namely Khargone, Dhar, Khandwa, Barwani, and Alirajpur.

The chilli crop is subjected to various diseases caused by fungi, bacteria, viruses, nematodes and physiological disorders at different stages of development. These are mainly fruit rot: *Colletotrichumcapsici* (Syd.) Butler and Bisby, damping off : *Pythiumaphanidermatum* (Edson) Fitz, powdery mildew: *Levillulataurica*(Lev.) Arn., bacterial leaf spot : *Xanthomonas compestrispv. vesicatoria* (Doidge) Dye, Cercospora leaf spot : *Cercosporacapsici* Cooke and Dry root rot : *Rhizoctoniasolani* kuhn. Among the major diseases of chilli, Die-back of chilli caused by *Colletotrichumcapsici* (Sydow) Butler and Bisby is one of the most destructive disease of chilli in India. Due to this disease more than 50% crop losses have been reported from different parts of India (Ramchandran *et al.*, 2007). The disease causes severe damage on red chilli fruits. Fruit rot mainly becomes problematic when it attacks mature fruits, causing both pre and post-harvest fruit decay, causing severe economic losses (Hadden and Black, 1988).

The decline in chilli production has been attributed to the diseases linked with crop like anthracnose or fruit rot causing the major share of crop loss. The disease causes severe damage to both mature fruits in the field as well as during their storage under favorable conditions, which amplifies the loss in yield and overall production of the crop. This review gives an account of the loss in production and yield procured in chili cultivation due to anthracnose disease in Indian sub-continent, with emphasis given to the sustainable management strategies against the conventionally recommended control for the disease.

MATERIALS AND METHODS

This investigation was carried out in *rabi* season during the period of 2019-20 and 2020-21 at the Dr. B. R. Ambedkarsamajikvigyan Kendra, Bordi, Rehti, Dr. B. R. Ambedkar university of Social science, Dr, Ambedkar Nagar. The eight treatments were evaluated on yield loss per cent hectare of chilli. The experiment was laid down randomized block design (RBD) with three replication and eight treatments with different doses. During the experiment. The

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rehti region comes under sub-tropical region, having a temperature range between 28°C- 41°C maximum and 8°C- 24°C minimum in summer and winter season, respectively. It is hotter during April to May while coolest in December to mid-January. Relative humidity generally fluctuates between 24.80 - 90 %. In this region, most of the rainfall is received during June to late September, while winter rains are uncertain. The annual rainfall is recorded 1000 to 1225mm. The south–west monsoon is responsible for the major precipitation.

Table 1. Treatment details

Treatment	Product	Dose
T1	Sulphur 80% WP	0.3%
T2	Azxystrobin 11 + Tebuconazole 18.3% WP	0.1%
T3	Azxystrobin 18.2 + Difenoconazole 11.4% SC	0.1 %
T4	Tebuconazole 25% WG	0.15%
T5	TrichodermaViride 1% WP	0.25%
T6	Eucalyptus oil	5%
T7	Neem oil	5%
T8	Control	Nil

RESULTS AND DISCUSSION

Yield loss percent per hectare

The calculation of yield loss per cent is essential for judging the economic loss of the chilli due to the chilli fruit rot disease caused by the *Colletotrichum capsici*. It was calculated in both of the year like 2019-20 and 2020-21 average of both of the year was also worked out.

During the 2019, the yield loss per cent was as influenced by different treatment and the yield loss per cent was ranges from 8.00% to 12.92%. The minimum significant yield loss per cent was recorded in the treatment T_2 (8.00%) followed by the treatment T_1 (9.33%), T_3 (8.175%), T_3 (8.175%), T_4 (9.00%) and T_5 (8.50%) while the maximum yield loss per cent was recorded in the treatment control. During the 2020-21 the yield loss per cent was as influenced by different treatment and the yield loss per cent was ranges from 8.37% to 12.97%. The minimum significant yield loss per cent was recorded in the treatment T_2 (8.37%) followed by the treatment T_1 (9.57%), T_3 (8.48%), T_4 (9.06%) and T_5 (8.65%) while the maximum yield loss per cent was recorded in the treatment control.

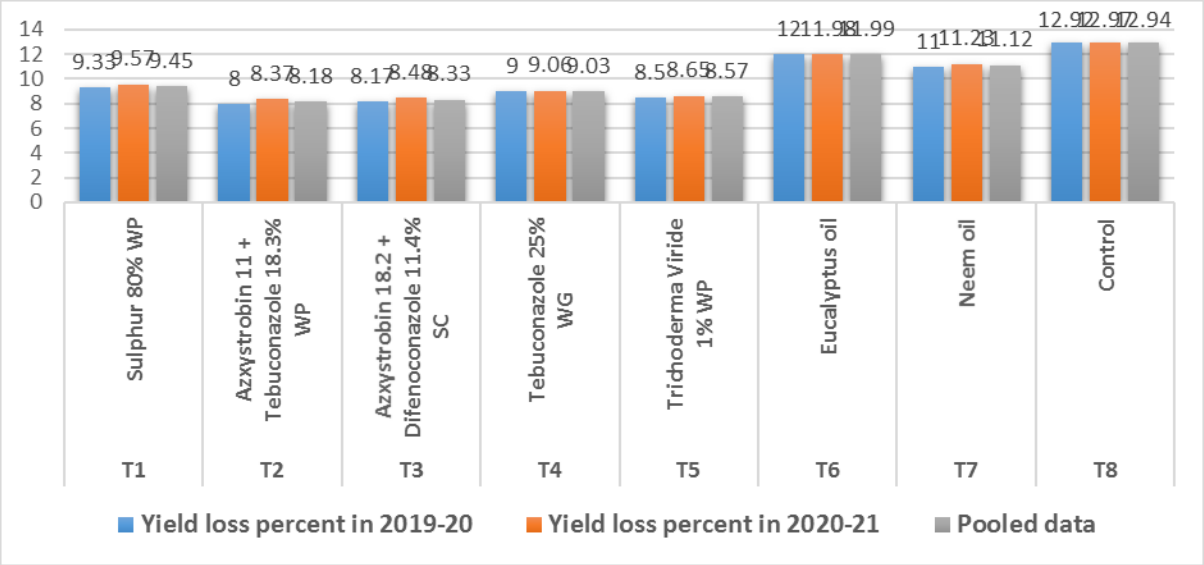
During the evaluation of the pooled data for both of the year the yield loss per cent was ranges from 8.18% to 12.94%. The minimum average yield loss per cent war recorded in the treatment T_2 (8.18%) followed by the treatment T_1 (9.45%), T_3 (8.33%), T_4 (9.03%) and T_5 (8.55%). Overall treatment T_2 (Azxystrobin 11 + Tebuconazole 18.3% WP) performed very well during the experiment. The yield loss might be due to the fruit rot disease of chilli caused by *colletotrichumcapsici* and the closely finding are Chowdhury, (1957).

Table 2. Effect of fungicide, botanical and bio-agent on yield loss percent per hectare

Treatment	Treatment Details	Yield loss percent in 2019-20	Yield loss percent in 2020-21	Pooled data
T1	Sulphur 80% WP	9.33	9.57	9.45
T2	Azxystrobin 11 + Tebuconazole 18.3% WP	8.00	8.37	8.18

T3	Azxystrobin 18.2 + Difenoconazole 11.4% SC	8.17	8.48	8.33
T4	Tebuconazole 25% WG	9.00	9.06	9.03
T5	TrichodermaViride 1% WP	8.50	8.65	8.57
T6	Eucalyptus oil	12.00	11.98	11.99
T7	Neem oil	11.00	11.23	11.12
T8	Control	12.92	12.97	12.94
SE(m)		0.77	0.68	0.72
SE(d)		1.08	0.96	1.01
CD		2.24	1.98	2.10

Table 3. Effect of fungicide, botanical and bio-agent on yield loss percent per hectare



CONCLUSION

It is concluded that the minimum average yield loss per cent war recorded in the treatment T_2 (8.18%) followed by the treatment T_1 (9.45%), T_3 (8.33%), T_4 (9.03%) and T_5 (8.55%). Overall treatment T_2 (Azxystrobin 11 + Tebuconazole 18.3% WP) performed very well during the experiment.

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