Pest Management in Horticultural Ecosystems
Vol. 31, No.1 pp 77-85 (2025)
DOI Number : 10.5958/0974-4541.2025.00015.1

In-vitro evaluation of fungicide combinations against fruit rot (*Colletotrichum truncatum*) in chilli

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ABSTRACT: The present investigation was carried out *in vitro* to evaluate effectiveness of combination of two fungicide products in comparison to individual components against fruit rot causing organism, *Colletotrichum truncatum* (Schwein.) Andrus & W.D. Moore [synonym *Colletotrichum capsici* (Syd. & P. Syd.) E.J. Butler & Bisby] in chilli crop. The effectiveness of two fungicides, Kresoxim methyl 44.3% SC @ 80, 40, 20, 10, 5 and 2.5 ppm and Tebuconazole 25.9% EC @ 20, 10, 5, 2.5, 1.25 and 0.625 ppm along with untreated control were assessed using food poison technique. Kresoxim methyl 44.3% SC at 80 ppm exhibited significantly low radial growth of the pathogen 0.93, 1.57 and 2.73 cm and resulting in 78.52, 78.78 and 67.88% growth inhibition at 3, 7 and 10 days after exposure, respectively. The lowest radial growth in Tebuconazole 25.9% EC at 20 ppm was 0.32, 0.60 and 0.92 cm with 94.32, 91.67 and 88.82% reduction in radial growth over control at 3, 7 and 10 days after exposure, respectively. The combination effect of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC at different levels (40+10, 40+5, 20+10, 20+5, 10+10 and 10+5 ppm), showed that the combination at 40+10 ppm level exhibited minimal radial growth of pathogen 0.45, 0.70 and 1.17 cm with 90.36, 90.54 and 86.12% growth inhibition over control at 3, 7 and 10 days of experimentation, respectively. The present investigation extends opportunities for field evaluation of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC as tank mix for the control of fruit rot disease of chilli crop.

Keywords: *In vitro*, kresoxim methyl, tebuconazole, chilli, *Colletotrichum truncatum*

INTRODUCTION

Chilli (*Capsicum annum* L.), a solanaceous crop is grown world over and consumed in the form of green vegetables as well as spices. A rich source of vitamins, pungency and flavours make it popular in almost all the household to use in one or the other form. The crop suffers from a number of insect pests and diseases during different phenological phases of the crop growth. Many fungal species are on record causing damping off or seedling rot at seedling stage, leaf spot, die back, fruit rot or anthracnose at fruiting stage, which hamper marketable quality and rest in higher economical loss to the grower. Anthracnose is one of the severe fungal diseases affecting chilli crop. In India, it is mainly caused by *Colletotrichum truncatum* (Schwein.) Andrus & W.D. Moore [synonym *Colletotrichum capsici* (Syd. & P. Syd.) E.J. Butler & Bisby] and by other species *C. acutatum* and *C. gloeosporioides*. It is characterized by sunken necrotic lesions at different stages of the crop and spreads widely during high humid conditions and leaves no scope to check its incidence in a short time.

To control the anthracnose/fruit rot disease on chilli crop, a number of fungicides have been approved by Govt. of India under the Insecticides Act, 1968 like, Azoxystrobin 23% SC, Chlorothalonil 75% WP, Difenoconazole 25% EC, Kresoxim methyl 44.3% SC, Pyraclostrobin 20% WG, Tebuconazole 25.9% EC and 25% WG, Thiophanate methyl 41.7% SC etc. In addition, a number of combination products of these and other fungicides also have been approved. The combination products comprising Kresoxim methyl as one of the constituents registered and approved are Kresoxim methyl 15% + Chlorothalonil 56% WG, Kresoxim methyl 18% + Mancozeb 54% WP, Kresoxim methyl 40% + Hexaconazole 8% WG, Kresoxim methyl 6% + Thifluzamide 26% SC and Flubendiamide 7.5% + Kresoxim methyl 37.5% SC. Similarly, the combination products of Tebuconazole as one of the constituents registered are Tebuconazole 6.7% + Captan 26.9% SC, Tebuconazole 10% + Sulphur 65% WG, Tebuconazole 50% + Trifloxystrobin 25% WG, Tebuconazole 15% + Zineb 57% WDG, Tricyclazole 18.0% + Tebuconazole 14.4% SC, Prochloraz 5.7% + Tebuconazole 1.4% ES and Prochloraz 24.4% + Tebuconazole 12.1% EW.

The *in vitro* studies on Azoxystrobin 11% + Tebuconazole 18.3% SC, Tebuconazole 50% + Trifloxystrobin 25% WG against *C. gloeosporioides* have been reported by Golakiya *et al.* (2020). Chandini *et al.* (2022) investigated Azoxystrobin 11% + Tebuconazole 18.3% w/w SC, Prochloraz 24.4% + Tebuconazole 12.15% w/w EW, Tebuconazole 50% + Trifloxystrobin 25% WG against *C. capsici*. Mondal and Sarkar (2023) evaluated Kresoxim methyl 40% WG + Hexaconazole 8% WG against fungal diseases like leaf spot, powdery mildew, twig blight and anthracnose in chilli crop. The present studies were undertaken for the compatibility of Kresoxim methyl and Tebuconazole against fruit rot causing organism in chilli under laboratory conditions.

MATERIALS AND METHODS

The chilli crop cultivated at Experimental Research Farm, IPFT, Gurugram during Kharif season 2024 was visited regularly and on appearance of disease symptoms on leaf, stem and formation of concentric ring on the fruit surface, the rotten fruits were collected in perforated polythene bags and brought to the laboratory for isolation, identification and purification of the pathogen.

Preparation of Potato Dextrose Agar medium and isolation of pathogen

The laboratory glasswares washed properly with soap solution were sterilized keeping inside hot air oven at least for 2 hours at 165 ºC. Potato Dextrose Agar (PDA) 40 g was taken in 1000 ml capacity conical flasks and added sterilized distilled water up to the mark. The contents were mixed thoroughly using magnetic stirrer for minimum 10 minutes. The mixture was then transferred to four conical flasks of 250 ml capacity and the mouth was plugged with cotton, which was subsequently wrapped with aluminum foil. The flasks containing the media were then autoclaved at 121 ºC and 15 psi for sterilization and media was poured in Petri plates inside laminar air flow. The diseased fruit samples collected from the field were washed with tap water and surface dried using sterilized tissue paper. The fruits were cut into small pieces (~3-5 mm) using sterilized blade and treated with 2% sodium hypochlorite solution and then washed thrice by distilled water. The small cut pieces were transferred aseptically on sterilized PDA Petri plates and incubated in BOD (Biochemical Oxygen Demand) incubator at 25 ^{o}C and 65 ± 5% RH for 5 to 7 days.

Purification and identification of pathogen

The Petri plates were examined for uniform pathogen colony growth and for any visible contamination. The contaminated Petri plates, were instantly discarded. The pathogen was purified by single hyphal tip method. For this, single hypha of the pathogen which showed uniform growth was transferred and cultured on new PDA Petri plates. The pathogen slowly spread out with its hyphal growth from the center to periphery of the Petri plates in search of nutrients and uniformly colonized the Petri plates. For identification of pathogen, a single hyphal strand was isolated from the fungal colony, fixed on a glass slide and observed under compound microscope and electron microscope for their conidia. The falcate conidia were examined for other morphological and cultural characters and isolated pathogen was identified as *Colletotrichum truncatum* following Mongkolporn *et al.* (2010); Prajapati *et al.* (2020); Sawant *et al.* (2023); R. S. Singh (1978) and Than *et al.* (2008). The hyphal tips were carefully transferred to PDA and maintained in BOD incubator at 25 ± 2^{o}C and 65 ± 5% RH for further use and PDA slants were also preserved in refrigerator at 4 ^{o}C for later studies. The sub-culturing of the isolated pathogen was done on monthly basis to maintain the culture for further scientific research.

Fungicidal treatments

The commercial formulation of fungicides Kresoxim methyl 44.3% SC and Tebuconazole 25.9% EC were used for the studies by food poisoning technique. The preliminary non replicated effective concentration range finding experiment of the two products was conducted using 400, 200, 100, 50, 25 and 12.5 ppm concentrations and based on the fungal growth, the main experiment was laid down. Different base concentrations 8000, 4000, 2000, 1000, 500 and 250 ppm of Kresoxim methyl 44.3% SC and 2000, 1000, 500, 250, 125 and 62.5 ppm of Tebuconazole 25.9% EC (based on the active ingredient of respective product) prepared in distilled water. Further to get the requisite working concentrations 80, 40, 20, 10, 5 and 2.5 ppm of Kresoxim methyl and 20, 10, 5, 2.5, 1,25 and 0.625 ppm of Tebuconazole, 1 ml of each base concentration was added to 100 ml luke warm PDA before solidification and poured in to the Petri plates. First experiment was conducted taking above respective concentrations. The pathogen discs (5 mm dia) were transferred aseptically under laminar air flow at the centre of all the Petri plates. The untreated

Petri plates were taken as control and each treatment was replicated thrice. The experiment set up was placed in BOD incubator at 25 ± 2°C and 65 ± 5% RH. The observations for fungal radial growth were recorded after 3, 7 and 10 days. Based on the results of first experiment, moderately effective concentrations were considered for second experiment to evaluate effectiveness of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC combinations in different compositions *viz*., 40+10, 40+5, 20+10, 20+5, 10+10 and 10+5 ppm. The same method as stated above for first experiment was followed to prepare working concentrations and experiment set up for second experiment as well. The percent inhibition of radial growth of the fungus was calculated by using the following formula:

$$Percent\ Inhibition = \frac{C - T}{T} * 100$$

Here,
C= control
T = Treatment

RESULTS AND DISCUSSION

The results of the antifungal activity of Kresoxim methyl 44.3% SC against the pathogen presented in Table 1 and fungal growth in Fig. 1, showed that the mycelial radial growth of the pathogen was efficiently checked at each concentration tested as compared to untreated control. The radial growth increased with the decrease in concentration of the product and ranged from 0.93 to 5.53 cm during the observation period. Higher radial growth 2.47, 4.20 and 5.53 cm was seen in 2.5 ppm treatment, whereas lowest growth was observed in 80 ppm 0.93, 1.57 and 2.73 cm after 3, 7 and 10 days of treatment, respectively. Overall, the growth of the fungus was significantly low in all the treatments as compared to untreated control which recorded highest growth 4.33, 7.40 and 8.50 cm after 3, 7 and 10 days, respectively. The per cent reduction in fungal growth calculated over untreated control presented graphically in Fig. 2, revealed that there was an increase in percent reduction of mycelial growth with increase in concentration of the product. The per cent reduction ranged 78.52-42.96%, 78.78-43.24% and 67.88-34.94% over control after 3, 7 and 10 days of treatment. Among the treatments, 80 ppm (78.52, 78.78 and 67.88%) and 40 ppm (72.98, 70.27 and 59.18%) of kresoxim methyl 44.3% SC exhibited higher percent growth inhibition of the pathogen, respectively.

Kresoxim methyl 50% SC (based on w/v) @ 400 and 500 ml/ha have been reported effective against fungal diseases like leaf spot, powdery mildew, twig blight and anthracnose in chilli crop (Mondal and Sarkar, 2023). Kresoxim methyl 44.3% SC (based on w/w) @ 500 ml/ha also found effective against die back and fruit rot of chilli (Azad *et al.*, 2016). Chu *et al.* (2022) reported that EC_{50} values of Kresoxim methyl against most of the *Colletotrichum gloeosporioides* isolates were higher than 500 µg a.i./ml (equivalent to > 500 ppm). Mandloi *et al.* (2023) have reported per cent inhibition of *C. truncatum*

Table 1. Effect of Kresoxim methyl 44.3% SC on radial growth of *Colletotrichum truncatum*

Treatment	Concentration (ppm)	Radial growth of pathogen (cm) (days after treatment)		
		3	7	10
T_1- Kresoxim methyl 44.3% SC	80	0.93 (0.97)	1.57 (1.25)	2.73 (1.65)
T_2- Kresoxim methyl 44.3% SC	40	1.17 (1.07)	2.20 (1.48)	3.47(1.86)
T_3- Kresoxim methyl 44.3% SC	20	1.30 (1.14)	2.47 (1.57)	3.93(1.98)
T_4- Kresoxim methyl 44.3% SC	10	1.53 (1.24)	2.80 (1.67)	4.27 (2.07)
T_5- Kresoxim methyl 44.3% SC	5.0	2.10 (1.45)	3.53 (1.88)	5.27 (2.29)
T_6- Kresoxim methyl 44.3% SC	2.5	2.47 (1.57)	4.20 (2.05)	5.53 (2.35)
T_7- Untreated control	--	4.33(2.08)	7.40 (2.72)	8.50(2.92)
S.Em ±		0.05	0.04	0.03
C.D (p=0.05)		0.14	0.11	0.08

Figures in the parentheses are square root transformed values

80 ppm | 40 ppm | 20 ppm | 10 ppm | 5 ppm | 2.5 ppm | Control

Fig. 1. Radial growth of *C. truncatum* in Kresoxim methyl 44.3% SC treatment at different concentration

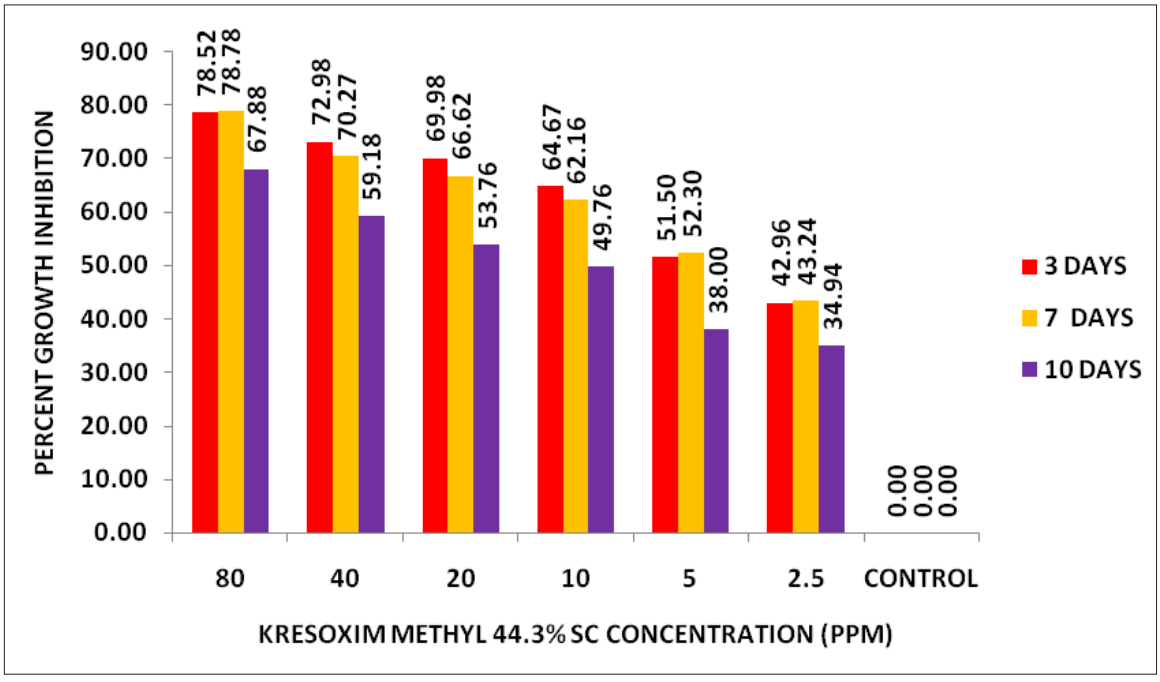

Fig. 2. Per cent growth inhibition of *C. truncatum* over control by Kresoxim methyl 44.3% SC

mycelial growth by 27.28, 30.35, 40.50 and 40.49% at 100, 250, 500 and 1000 ppm of Kresoxim methyl 44.3% SC after 7 days, which were comparatively low as compared to the present study, wherein the growth of the pathogen highly suppressed at 80 ppm and resulted in 78.78% reduction in radial growth. The reduction in mycelial growth of the pathogen by Kresoxim methyl (strobilurin compound) is attributed to be a quinone outside inhibitor, inhibiting mitochondrial respiration by blocking electron transfer between cytochrome b and cytochrome c_1 at the ubiquinol oxidizing site.

The antifungal activity of tebuconazole 25.9% EC against *C. truncatum* presented in table 2 and fungal growth in Fig. 3 showed that the mycelial radial growth of the pathogen was efficiently controlled at each concentration tested as compared to untreated control. The increase in radial growth was observed with decrease in concentration of the product, which ranged from 0.32 to 6.94 cm during the observation period. The radial growth 4.47, 5.76 and 6.94 cm in 0.625 ppm treatment were higher, whereas low growth was observed in 20 ppm 0.32, 0.60 and 0.92 cm after 3, 7 and 10 days of treatment, respectively. The growth of the fungus was significantly low in all the treatments when compared with untreated control where after 3, 7 and 10 days the growth recorded was quite higher 5.63, 7.20 and 8.23 cm, respectively. The per cent reduction in fungal growth in all the treatments calculated over untreated control has been presented in Fig. 4. The increase in percent reduction of mycelial growth was resulted with increase in concentration of the tested product. The per cent reduction after 3, 7 and 10 days of treatment ranged 94.32-20.60%, 91.67-20.00% and 88.82-15.67% over untreated control. Among the treatments, 20 ppm (94.32, 91.67 and 88.82%), 10 ppm (89.34, 90.14 and 86.27%) and 5 ppm (78.69, 82.22 and 80.07%) of tebuconazole 25.9% EC exhibited higher percent growth inhibition of the pathogen at 3, 7 and 10 days after treatment, respectively.

Table 2. Effect of tebuconazol 25.9% EC on radial growth of *C. truncatum*

Treatment	Concentration (ppm)	Radial growth of pathogen (cm) (days after treatment)		
		3	7	10
T_1 - Tebuconazole 25.9% EC	20	0.32 (0.57)	0.60 (0.77)	0.92 (0.96)
T_2 - Tebuconazole 25.9% EC	10	0.60 (0.77)	0.71 (0.84)	1.13 (1.06)
T_3 - Tebuconazole 25.9% EC	5.0	1.20 (1.09)	1.28 (1.13)	1.64 (1.28)
T_4 - Tebuconazole 25.9% EC	2.5	3.30 (1.82)	4.23 (2.06)	5.70 (2.39)
T_5 - Tebuconazole 25.9% EC	1.25	3.85 (1.96)	5.12 (2.26)	6.51 (2.55)
T_6 - Tebuconazole 25.9% EC	0.625	4.47 (2.11)	5.76 (2.40)	6.94 (2.63)
T_7 - Untreated control	--	5.63 (2.37)	7.20 (2.68)	8.23 (2.87)
S.Em ±		0.03	0.02	0.03
C.D (p=0.05)		0.09	0.07	0.09

Figures in the parentheses are square root transformed values

20 ppm 10 ppm 5 ppm 2.5 ppm 1.25 ppm 0.625 ppm Control

Fig. 3. Radial growth of *C. truncatum*in at different concentration of tebuconazole 25.9% EC treatment

Tebuconazole 25.9% EC @ 500 ml/ha reported to be effective against die back and fruit rot of chilli crop and more or less equally effective with Kresoxim methyl 44.3% SC @ 500 ml/ha (Azad *et al.*, 2016). *In vitro* evaluation of Tebuconazole 25.9% EC @ 100, 150 and 200 µg/ml (equivalent to 100, 150 and 200 ppm) has been found effective against four isolates of *C. capsici* (78.33 to 100.00% inhibition) by (Begum *et al.*, 2015). However, Tebuconazole has been reported to be effective against *C. capsici* with ED_{50} value of 12 µg/ml (12 ppm) by (Chander *et al.*, 2004). The present study corroborates the above findings where the growth of *C. truncatum* at 20 ppm resulted in reduction of radial growth up to 94.32%. The reduction in mycelial growth of the pathogen by Tebuconazole (a triazole compound) is attributed to be a sterol demethylation (ergosterol biosynthesis) inhibitor, which means it inhibit synthesis of ergosterol, affecting the cell walls of fungi and causing suppression of spore germination and fungus growth (Dong, 2024).

Machenahalli *et al.* (2021) reported tebuconazole 430 SC at 250, 500 and 1000 ppm effectively controlled coffee leaf blight pathogen *C. gloeosporioides in vitro* and (Ramesh *et al.*, 2020) reported that the product at 8.5 ml/10 lit was most effective against anthracnose caused by same pathogen in pomegranate under field conditions.

Kumbhar and More (2013) reported that under field conditions tebuconazole 25.9% EC effectively reduced the incidence (69.96%) and intensity (73.56%) of fruit rot caused by *C. capsici* in chilli crop. In the present study, tebuconazole at 20 ppm was found to be the best treatment in inhibiting the pathogen growth. (Golakiya *et al.*, 2020) reported cent per cent mycelial growth inhibition of *C. gloeosporioides* by Tebuconazole 25.9% EC @ 100, 250 and 500 ppm and also summarized those fungicides of triazole group were more effective as compared to strobilurin group. In the present study also, it was observed that the effectiveness of Tebuconazole

25.9% EC (triazole group) was far better than Kresoxim methyl 44.3% SC (strobilurin group) against *C. truncatum*.

The combination of kresoxim methyl 44.3% SC and Tebuconazole 25.9% EC to evaluate the anti-fungal activity, the respective intermediate effective doses 40 and 10 ppm were taken as the highest doses and other treatments were taken in different ratios. The data on *C. truncatum* mycelial radial growth presented in Table 3 and Fig. 5 showed that the radial growth of the fungi was significantly low in combination treatments of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC as compared to control treatment. The radial growth was low in the treatment of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC @ 40 + 10 ppm (0.45, 0.70 and 1.17 cm after 3, 7and 10 days, respectively) followed by dose rate @ 20 + 10 ppm (0.60, 0.93 and 1.20 cm). The per cent inhibition of fungal growth calculated over untreated control ranged from 90.36-68.52%, 90.54-77.03% and 86.12-69.51% after 3, 7 and 10 days of treatment (Fig. 6). Among the treatments, 40 + 10 ppm of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC exhibited highest percent growth inhibition of the pathogen (90.36, 90.54 and 86.12%) followed by 20 + 10 ppm (87.51, 87.43 and 85.77%) over control, after 3, 7 and 10 days of exposure.

The radial growth in all the treatments represented an increasing trend with the time spent. But the rate of increase was different, which showed no trend in per cent inhibition in fungal growth. The combined impact of Kresoxim methyl and Tebuconazole by way of inhibiting mitochondrial respiration and ergosterol synthesis, respectively resulted in better effectiveness as compared to Kresoxim methyl 44.3% SC alone at corresponding concentrations, however found more or less equally effective with Tebuconazole 25.9% EC. The above findings corroborate to (Golakiya *et al.*, 2020) that trizole group of fungicides alone or in combination were resulted to be more effective based on Azoxystrobin 11% + Tebuconazole 18.3% SC and Tebuconazole 50% + Trifloxystrobin 25% WG *in vitro* evaluation at 100, 250, 500 and 1000 ppm and Tebuconazole 25.9% EC @ 100, 250 and 500 ppm with complete growth inhibition of *C. gloeosporioides*. On the other hand, observations made by (Chandini *et al.*., 2022) *in vitro* against *C. capsici* revealed that Tebuconazole 25.9% EC was more effective as compared to different combination products with Tebuconazole as one of the constituents (Azoxystrobin 11% + Tebuconazole 18.3% w/w SC, Prochloraz 24.4% + Tebuconazole 12.15% w/w EW, Tebuconazole 50% + Trifloxystrobin 25% WG). Singh *et al.* (2012) reported Trifloxystrobin + Tebuconazole combination to be effective *in vitro* with 100% inhibition of *C. gloeosporioides* at 500 ppm and Begum *et al.* (2015) against four isolates of *C. capsici* investigated that @ 50 to 200 µg/ml (equivalent to 50 to 200 ppm) of the product inhibited the mycelial growth from 79.4 to 100%. Kresoxim methyl 40% WG + Hexaconazole 8% WG @ 500 and 625 g/ha have been reported effective against fungal diseases like leaf spot, powdery mildew, twig blight and anthracnose in chilli crop (Mondal

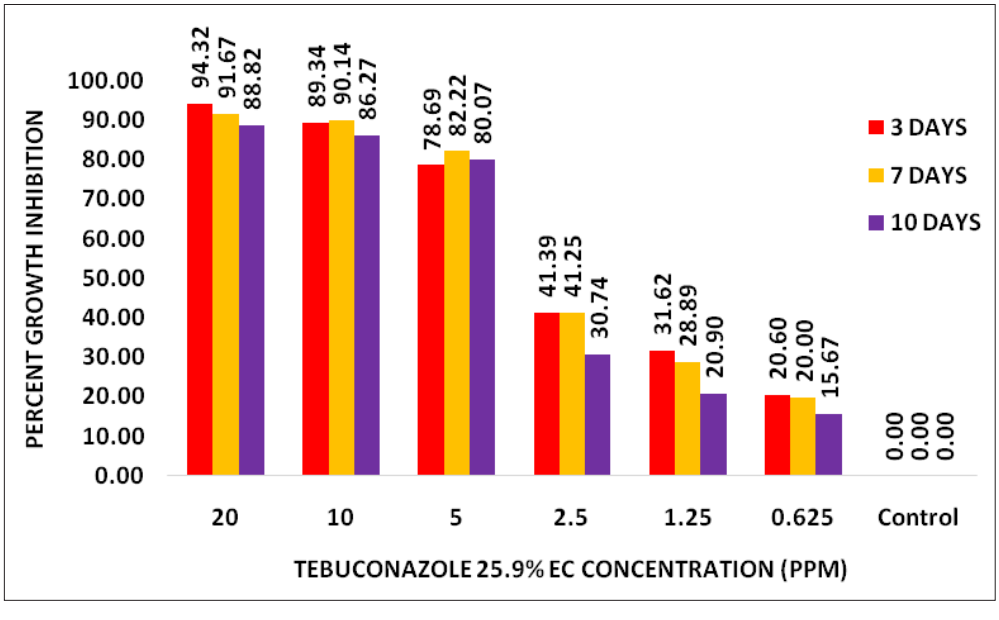

Fig. 4. Per cent growth inhibition of *C. truncatum* over control by Tebuconazole 25.9% EC

Table 3. Combined effect of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC on radial growth of *C. truncatum*

Treatment	Concentration (ppm)	Radial growth of pathogen (cm) (days after treatment)		
		3	7	10
T_1 - Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC	40 +10	0.45 (0.67)	0.70 (0.83)	1.17 (1.08)
T_2 - Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC	40 + 5	0.67 (0.82)	1.47 (1.21)	1.60 (1.26)
T_3 - Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC	20 + 10	0.60 (0.77)	0.93 (0.96)	1.20 (1.09)
T_4 - Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC	20 + 5	0.85 (0.92)	1.37 (1.17)	1.87 (1.37)
T_5 - Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC	10 + 10	0.80 (0.89)	1.73 (1.32)	1.77 (1.33)
T_6 - Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC	10 + 5	1.47 (1.21)	1.70 (1.30)	2.57 (1.60)
T_7 - Untreated control	--	4.67 (2.16)	7.40 (2.72)	8.43 (2.90)
S.Em ±		0.02	0.03	0.02
C.D (p=0.05)		0.07	0.08	0.08

Figures in the parentheses are square root transformed values

40+10 ppm | 40+5 ppm | 20+10 ppm | 20+5 ppm | 10+10 ppm | 10+5 ppm | Control

Fig. 5. Radial growth of *C. truncatumin Kresoxim* methyl 44.3% SC + Tebuconazole 25.9% EC treatment

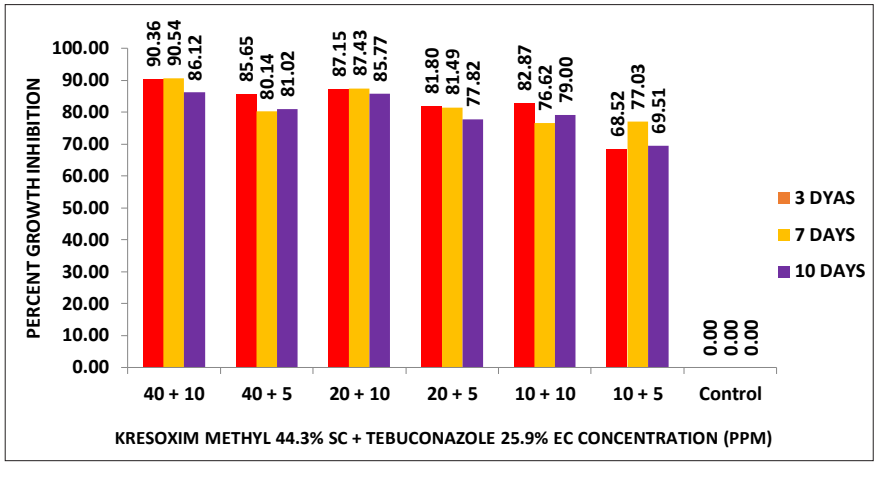

Fig. 6. Per cent growth inhibition of *C. truncatumover* control by Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC

and Sarkar, 2023). The *in vitro* results of the present study confirm the compatibility of Kresoxim methyl and Tebuconazole against *C. truncatum* and both the fungicides have a potential for controlling the diseases caused by the pathogen. However, it is imperative to evaluate the combination composition under field conditions as tank mix to find out the minimum effective dose for the control of fruit rot disease in chilli crop.

CONCLUSION

Kresoxim methyl 44.3% SC @ 2.5 to 80 ppm and Tebuconazole 25.9% EC @ 0.625 to 20 ppm were investigated *in vitro* by food poisoning method against the pathogen, *Colletotrichum truncatum* causing fruit rot disease in chilli crop. The concentrations 80 and 40 ppm of Kresoxim methyl 44.3% SC with 67.88-78.78% and 59.18-72.98% and 20, 10 and 5 ppm of Tebuconazole 25.9% EC with 88.82-94.32, 86.27-90.14% and 78.69-82.22%, respectively were quite effective to check the mycelial growth of the pathogen. The combination of Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC at different ratios were also investigated. The combination of these two products @ 40 + 10 ppm and 20 + 10 ppm, recorded minimal mycelial growth with growth inhibition 86.12-90.54% and 85.77-87.43%, respectively over control. The field evaluation of the combination product Kresoxim methyl 44.3% SC + Tebuconazole 25.9% EC as tank mix is further to be studied to find out the effective dose of the product to control fruit rot diseases of chilli crop.

ACKNOWLEDGEMENT

The authors are grateful to the Director, IPFT, Gurugram for encouragement and providing the necessary facilities.

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MS Received: 04 March 2025
MS Acceptance: 21 May 2025