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Management of black spot of rose caused by *Diplocarpon rosae* wolf

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Abstract
Among the flower crops rose is the most important flower crop grown throughout the world. In terms of area cultivated and production, it is perennial high input crop with more economical in cultivation and gives maximum income to the farmer. Rose suffers from many foliar diseases. Among them black spot caused by *Diplocarpon rosae* is major destructive disease. It appears in epidemic form almost every year in varying intensity leading to greater yield losses. Most of the rose varieties were reported susceptible to this disease. Therefore, it was necessary to obtain the information on disease initiation, symptoms and management by using different fungicides and estimation of their economics. In the present study of investigation efficacy of various fungicides viz., Azoxystrobin 0.1%, Mancozeb + Carbendazim 0.2%, Topsin 0.05%, Myclobutanil 0.1%, Tebuconazole 0.1%, Chlorothalonil 0.2%, and the bioagent *T. viride* 0.2% were evaluated *in vivo* and their economics was computed. After third spray, minimum percent disease intensity was recorded by Chlorothalonil 0.2% (11.23 PDI) and Topsin M 0.05% (13.50 PDI) and both these treatments were at par with each other. Next promising treatment was Myclobutanil 0.1% followed by Mancozeb + Carbendazim 0.2%, Azoxystrobin 0.1%, *T. viride* 0.2% and Tebuconazole 0.1% recording 15.32, 18.13, 21.10, 25.24, 30.27 PDI respectively.
Maximum cut flower yield was obtained in the treatment chlorothalonil 75 WP @ 0.2% (19.55 q/ha) and the percent increase in the yield over control was 67.32% followed by topsin M 70 WP @ 0.05% (18.56 q/ha).

Keywords: Black spot, rose caused, *Diplocarpon rosae* wolf

Introduction
Roses are preferred over the flowers as the most popular flowering plants. It is on top ranking as cut flower trade on the basis of acreage, production and consumption. It is also known as "Queen of flowers". Roses are symbols of love and beauty. The fragrance and multiple uses of roses as cut flower or landscape plants have made roses an appreciated crop since ancient times. From as Economical standpoint, roses are the most important plant in ornamental horticulture (Hummer and Jenick, 2009) [2]. Cut roses play an important role in interior decoration, add charm to different occasions and extensively used for decorative purposes. Besides this it is used for covering trellis, arbors, arches, for giving mass effect in beds or growing pots. They beautify the garden and surroundings with the luxurious colors and rich fragrance. Rose has a number of colour strains with small fractions of fragrance. The total area under floriculture in India is 1044 thousand ha with production of 36.51 lakh MT and 3.49 MT ha-1 of productivity. The cut flower production in year 2017-18 was 5.70 lakh MT while that of loose flower was 29.1 lakh MT. (Anon, 2018) [1]. Rose is a commercial cut flower crop fetching yield of 2-4 tonnes per hectare. The flower yield is considerably decreasing in recent days due to the invading of pest and disease. The crop is vulnerable to several diseases and suffers from number of diseases such as: Black spot, powdery mildew, die back, botrytis blight, rust, crown gall, downey mildew (Rowsell, 1990) [3] Out of this diseases the black spot caused by *Diplocarpon rosae* is predominant and causes great loses.
It is also considered as one of the most serious disease that are caused by the fungus *Diplocarpon rosae* and asexual stage *Marssonina rosae* (Sinha, 2017) [5, 6]. The fungus belongs to the Kingdom-Fungi, Division-Ascomycota, Class- Leotiomycetes, Order- Helotiales, Family- Dermatacae, Genus- *Diplocarpon* and species- *rosae*. The incidence of black spot disease (*Diplocarpon rosae*) was highest in various rose cultivars viz., Arjun, Golden Times, Super star and in Gladiator (Thammaiah *et al*., 1997) [7]. The black spot of rose is a foliar disease characterized by black spot with an irregular margin on the upper side of the leaf.

The first visible symptoms are black spots of approximately 1 mm on the upper side of the leaf, which can increase to an average of 15 mm. Spots close to each other merge to form bigger spots. On some susceptible varieties, infected leaves may turn yellow, but the immediate area around the black spots remains green forming 'green islands'.

Methods and Materials

The present investigation deals with recording intensity of black spot disease of rose and evaluation of efficacy of different fungicides and bioagent for controlling the black spot *in vivo*. The materials and methods used in present investigation are mentioned below.

For the recording of black spot of rose, the three chemical sprays with 15 days of interval were carried out after incidence of disease and the observations were recorded on percentage leaf area covered by the disease on susceptible variety Gladiator, after 8 days of every spray.

Field experiment was laid out in Randomized Block Design (R.B.D) replicated three times with eight treatments.

Table 1: Details of chemical fungicides and bioagent *in-vivo*.

Sr. No.	Treatments	Concentrations
T1	Azoxystrobin 23 SC	0.1
T2	Mancozeb + Carbendazim 50 WP	0.2
T3	Topsin M 70 WP	0.05
T4	Myclobutanil 10 WP	0.1
T5	Tebuconazole 25 EC	0.1
T6	Chlorothalonil 75 WP	0.2
T7	*Trichoderma viride*	0.2
T8	Control	-

Plate 2: 0 to 5 Grade infection of Black spot of rose.

Table 2: Scale of Black spot.

Sr. No.	Grade	Percent leaf area covered	Reaction type
1	0	0.00	Immune
2	1	Less than 1	Highly resistant
3	2	1-10	Resistant
4	3	11-25	Moderately resistant
5	4	26-50	Susceptible
6	5	Above 50	Highly susceptible

(Sharma and Singh, 2002) [4]

The observation on the disease intensity were recorded after incidence of disease on the basis of leaf area covered by the fungal growth with 0-5 scale recorded by Sharma and Singh (2002) [4] on randomly selected three twigs of a plant and from each twig two leaves were selected for observations and percent disease intensity was computed.

The percent disease intensity was calculated by following formula:

$$PDI = \frac{\text{Summation of all numerical ratings}}{\text{Total number of leaves observed x Max grade}} \times 100$$

The percent disease control was calculated by following formula

$$PDC = \frac{\text{PDI in control} - \text{PDI in treatment}}{\text{Control}} \times 100$$

Result and Discussion

Field evaluation of fungicides

Six fungicides such as Azoxystrobin, Mancozeb + Carbendazim, Topsin M, Myclobutanil, Tebuconazole, Chlorothalonil and one bioagent *T. viride* were tested against rose black spot in field conditions. The results on efficacy and yield were presented in the table 3 and graphically illustrated in fig. 1, 2, 3.

Table 3: Efficacy of different fungicides and bioagent on black spot of rose after three sprayings.

Sr. No.	Treatment Details	Conc. (%)	After 1st spraying		After 2nd spraying		After 3rd Spraying		Average fresh flower yield	% increase in the yield over control
			PDI	PDC	PDI	PDC	PDI	PDC		
T1	Azoxystrobin 23 SC	0.1	27.04 *(31.33)	30.59	24.35 *(29.5)	42.13	21.10 *(27.3)	56.50	15.52	19.54
T2	Mancozeb + Carbendazim 50 WP	0.2	23.51 (29.00)	39.65	21.29 (27.47)	49.40	18.13 (25.20)	62.62	18.56	27.40
T3	Topsin M 70 WP	0.05	17.15 (24.46)	55.98	16.25 (23.77)	61.38	13.50 (21.55)	72.17	16.19	55.05
T4	Myclobutanil 10 WP	0.1	20.29 (26.77)	47.92	19.04 (25.87)	54.75	15.32 (23.04)	68.41	13.23	35.25
T5	Tebuconazole 25 EC	0.1	35.33 (36.46)	9.31	33.16 (35.15)	21.19	30.27 (33.37)	37.60	19.55	10.52
T6	Chlorothalonil 75 WP	0.2	15.30 (23.02)	60.72	14.31 (22.22)	65.99	11.23 (19.57)	76.85	13.67	67.32
T7	*Trichoderma viride*	0.2	31.67 (34.24)	18.71	28.33 (32.15)	32.67	25.24 (30.15)	47.96	11.97	14.20
T8	Control	-	38.96 (38.62)		42.08 (40.49)		48.51 (44.14)		Sig.	19.54
	'F' test		Sig.		Sig.		Sig.		0.13	27.40
	SE ± (m)		1.51		1.22		1.07		0.38	55.05
	CD P = 0.05		4.58		3.17		3.26		14.31	35.25

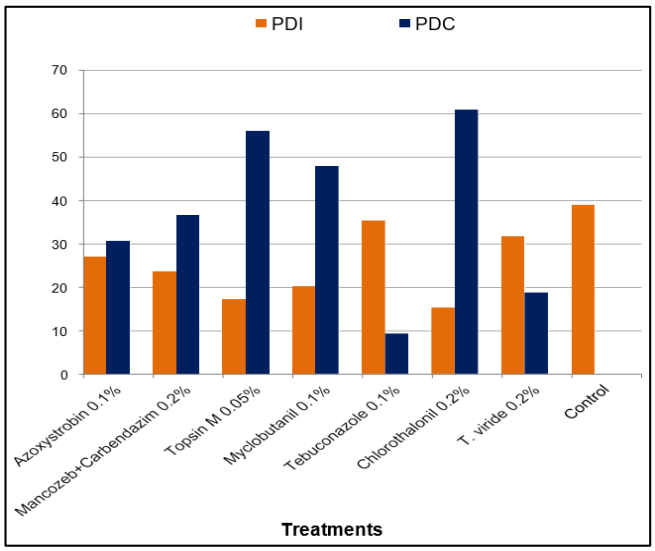

Fig 1: Percent disease intensity and percent disease control due to various treatments after 1st spraying

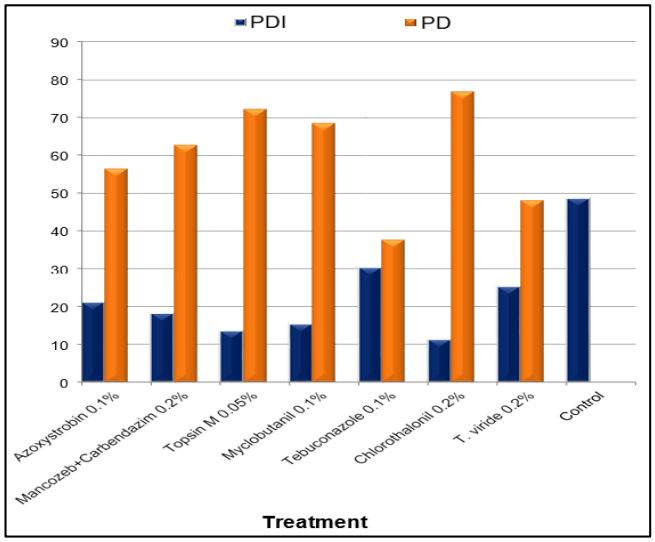

Fig 2: Percent disease intensity and percent disease control due to various treatments after 2nd spraying

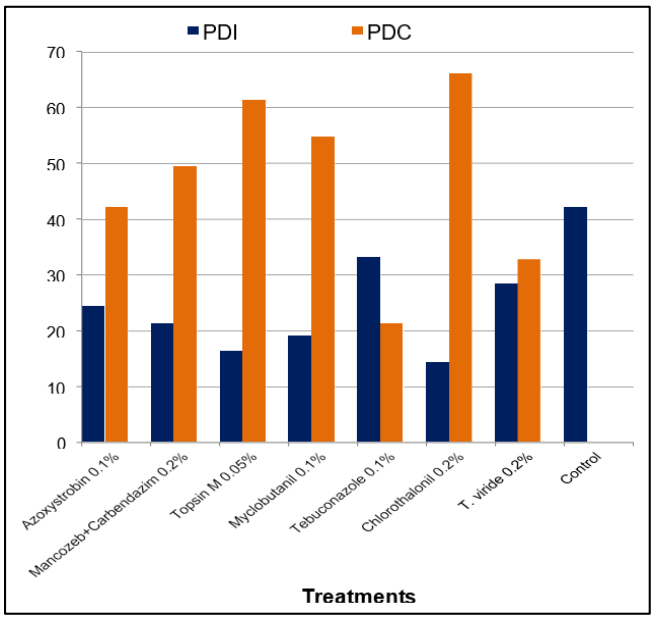

Fig 3: Percent disease intensity and percent disease control due to various treatments after 3rd spraying

Conclusion

After the third spray, it was revealed that minimum percent disease intensity was recorded by Chlorothalonil 0.2% (11.23 PDI) and Topsin M 0.05% (13.50 PDI) and both these treatments were at par with each other. Next promising treatment was myclobutanil 0.1% followed by mancozeb+ carbendazim 0.2%, azoxystrobin 0.1% and *T. viride* recording 15.32, 18.13, 21.10 and 25.24 PDI respectively. Similarly the percent disease intensity noticed in Tebuconazole 0.1% was 30.27 PDI. Maximum percent disease intensity was observed in control recording 48.51 PDI. The maximum percent disease intensity among the fungicides was observed in Tebuconazole 0.1% (30.27%) And highest percent disease intensity was recorded in control (48.51%). As regarding cut flower yield, highest yield was recorded (19.55 q/ha) in chlorothalonil 0.2% followed by topsin M 0.05% (18.56 q/ha). The lowest yield was noticed in tebuconazole 0.1% (13.23 q/ha).

References

1. Anonymous. Horticulture Production Scenario, Indian Horti Database; c2018.
2. Hummer KE, Jenick J. Rosaceae: taxonomy, economic importance, genomics. In: Genetics and Genomics of Rosaceae (Flota and Gardiner S E, Eda.). Springer Science Buisness Media; c2009. p. 1-17.
3. Rowsell D. Pest and disease of rose. proc. inter. Pl, propagators. SOC. 1990;40:260-263.
4. Sharma P, Singh AP. Multiple disease resistance in roses against foliar and flower pathogens. Indian Phytopathol. 2002;55(2):169-172.
5. Sinha R. Study on Rose Disease; c2017.
6. Sinha R. Study on Rose Disease: Identification, Detection and Cure. IJEDR; c2017. p. 5. ISSN: 2321-9939.
7. Thammaiah N, Reddy BS, Gangadharappa PM, Kanamadi VC, Kulkarni BS. Screening of rose cultivars against diseases. Advance in Agric. Res. in India. c1997;8:17-18.