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Evaluation of bio-efficacy of new fungicide molecule- Ametoctradin 300 g/l + dimethomorph 225 g/l sc against downy mildew of grapes in Northern Karnataka

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ABSTRACT

A field experiment was conducted to evaluate the efficacy of ametoctradin 300 g/l + Dimethomorph 225 g/l sc against downy mildew disease of grapes for 2 seasons at Agricultural Research Station Bagalkot district. It was found that Ametoctradin 300 g/l + Dimethomorph 225 g/l sc is highly effective in reducing the downy mildew disease in grapes. Further the phytotoxicity was not observed in the chemical Ametoctradin 300 g/l + Dimethomorph 225 g/l sc to the treated plots of grapevine even at high doses and also exhibiting an appreciable increase in grape berry yield.

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INTRODUCTION

Grapevine (*Vitis vinif era* L.) is an important commercial fruit crop and one of the most widely cultivated crops in temperate, sub-tropical and tropical regions of the world. There are over 8,000 grape varieties in worldwide and grape appears in the top ten of the world. Favorite fruits, along with tomatoes, mangos and bananas. Grapevine cultivation offers a great economic potential due to its higher yield and monetary returns owing to the export to Gulf, European countries and to some extent West Asian countries. Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Punjab are the major grapevine growing states of India (Dethe, 2000). In northern Karnataka, grape cultivation covers parts of Belgaum, Bijapur, Bagalkot, Koppal and Gulbarga districts. However, grapes traditionally faces serious risks due to diseases such as downy mildew, powdery mildew, anthracnose, alternaria bunch necrosis and fruit decay (*Botrytis*, *Greeneria*, *Aspergillus* etc.) often resulting in devastating losses every now and then. Particularly in case of diseases like downy mildew and powdery mildew infections, which spread rapidly, destroying the crop within a short period.

Downy mildew in particular poses a serious threat to grapevine cultivation due to its epidemic nature of spread, and rapid destruction of foliage and fruits. They achieving little success use several fungicides recommended or otherwise. Hitherto, intensive applications of systemic fungicides such as metalaxyl MZ, cymoxanil MZ, and fosetyl Al etc. are routinely used in the management of this disease. However, it has been observed that, the frequent of these fungicides has lead to development of resistance in the pathogen rendering these fungicides no longer effective (Reddy, 1985 and Rao and Reddy, 1988).

Huge amounts of chemicals and money is spent by the grape growers to manage these dreaded diseases often end up with undesirable results. Hence, a new approach of using combination products needs to be adopted as an alternative strategy to overcome resistance as well as residual toxicity. Several combination products are coming up and are being evaluated as experimental fungicides (Sapkal *et al*., 2002). Hence, the present investigation was undertaken to evaluate the bio efficacy and phytotoxicity of Ametoctradin 300 g/l + Dimethomorph 225 g/l sc; a combi product of against downy mildew diseases on grapes 2019 on October pruned plants.

MATERIAL AND METHODS

The experiment was laid out in a Randomized Block Design at Agricultural Research Station Bagalkot on 6-year old grapevine (var. Thompson Seedless) pruned in the early October (First week). The treatments were initiated at the disease appearance stage *i.e*., around last week of October/November corresponding to downy mildew and powdery mildew diseases. Each treatment (Table 1) consisting of four plants was replicated four times. The treatments were commenced at the disease appearance stages of respective diseases on the leaves. Totally three sprays at 15 days intervals were given and no fungicides were applied on the unsprayed control plants. The disease incidence on the intensity of downy mildew and powdery mildew was recorded using 0-9 scale on randomly selected branches in each treatment after final spray and the per cent disease index (PDI) worked out (Wheeler, 1969). The data was suitably transformed and analyzed statistically. The fruit yield obtained in each treatment was recorded at harvesting stage and extrapolated to yield in terms of tonnes per hectare and analyzed statistically. For determining the phytotoxicity of fungicides 0-10 (Jamadar and Desai, 1997) scale was used.

RESULTS AND DISCUSSION

The results (Table 1) on the bio-efficacy of Ametoctradin 300 g/l + Dimethomorph 225 g/l sc in the management of downy mildew of grapes recorded are

Table 1: Bio-efficacy of Ametoctradin 300 g/l + Dimethomorph 225 g/l SC against downy mildew of grapes for the year 2019

Sr. No	Treatments	Formulation dosage (g or ml/Ha)	Per cent disease index			% disease reduction over control	Fruit yield (t/ha)
			After 1st spray	After 2nd spray	After 3rd spray		
1.	Ametoctradin 300 g/l + Dimethomorph 225 g/l SC	700	9.22 (17.68)	10.16 (18.59)	19.03 (25.86)	70.53	19.08
2.	Ametoctradin 300 g/l + Dimethomorph 225 g/l SC	1000	6.31 (14.55)	9.32 (17.78)	13.84 (21.84)	72.29	21.42
3.	Ametoctradin 300 g/l + Dimethomorph 225 g/l SC (Market sample)	800	10.01 (18.41)	11.12 (17.46)	18.21 (25.26)	62.23	17.82
4.	Ametoctradin 300 g/l + Dimethomorph 225 g/l SC (Market sample)	1000	6.52 (18.41)	9.87 (17.46)	14.01 (21.41)	70.93	20.93
5.	Ametoctradin 25 % SC	2500	16.32 (23.83)	21.11 (27.35)	26.62 (31.06)	44.78	14.21
6.	Dimethomorph 50 % WP	1000	14.68 (22.53)	19.18 (25.97)	20.31(26.79)	57.87	16.18
7.	Cymoxanil 8% + Mancozeb 64% WP	1500	12.23 (20.47)	18.36 (25.37)	19.58 (26.26)	59.39	17.36
8.	Untreated control	-	27.41 (31.57)	36.62 (37.24)	48.21 (43.97)	-	11.96
	S.E.±		1.68	1.31	1.85		1.76
	CV%		10.43	17.42	18.86		15.51
	C.D. (P= 0.05)		3.96	4.84	6.31		4.64

detailed as under. Among the different treatments high dose Ametoctradin 300 g/l + Dimethomorph 225 g/l SC and Ametoctradin 300 g/l + Dimethomorph 225 g/l SC (market sample) @ 1000 ml/ha recorded the significantly least downy mildew incidence (13.84% and 14.01%) over all other treatments and is better than the Ametoctradin 300 g/l + Dimethomorph 225 g/l SC Ametoctradin 300 g/l + Dimethomorph 225 g/l SC (market sample) @ 800 ml/ha. Next best treatment was Cymoxanil 8% + Mancozeb 64% WP @ 1500 g/ha with percent diseases index of 19.58% while control showed with 48.21% percent diseases incidence.

Significantly the highest fruit yield was recorded by spraying Ametoctradin 300 g/l + Dimethomorph 225 g/l SC and Ametoctradin 300 g/l + Dimethomorph 225 g/l SC (market sample) with 21.42 t/ha and 20.93 t/ha. Ametoctradin 300 g/l + Dimethomorph 225 g/l SC and Ametoctradin 300 g/l + Dimethomorph 225 g/l SC (market sample) at 800 ml/ha was found to be next best treatment in terms of fruit yield. Whereas unsprayed control recorded lowest yield (11.96 t/ha).

Jamadar *et al*. (2004) evaluated the fungicide formulation azoxystrobin (Amistar 250SC) against downy and powdery mildew diseases at 250 and 500 ml/ha and found highly efficient. Thus, considering overall efficacy for downy mildew diseases; it was apparent that, Ametoctradin 300 g/l + Dimethomorph 225 g/l SC @1000 ml/ha^{-1} was found to be the most effective for the management of downy mildew of grapes evaluated for during 2019 without any phytotoxicity on foliage/fruits as well as any harmful effects on natural enemies. Similarly, Jagtap and Dethe (2001) and Virupaksha Prabhu *et al*. (2004) have reported bio-efficacy and residual safety of such fungicide combi-products against downy mildew disease on grapes.

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