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Short Communication

Myclobutanil 10 WP, A Fungicide to Control Powdery Mildew of Grape in Cold Arid Zone of Kargil, Ladakh

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INTRODUCTION

Grape cultivation is considered to be an economic venture for the farmers due to its high monetary returns. Grape belongs to the family Vitaceae which consists of 12 genera and 600 species. Among these, Vitis vinifera produces the highest quantity of grapes either as pure vinifera or in the form of hybrids. Grape cultivation occupies an area of 140 thousand ha with the production of 3,125 thousand MT (Anonymous, 2020a). Powdery mildew is caused by Erysiphe necator, a polycyclic fungus infecting all green tissues with gray-white mycelia on their surface. *E. necator can cause a reduction in grape yield of up to 45* per cent, as a consequence of smaller diseased berries (Calonnec *et al,* 2004). In addition, severely infected clusters have higher total acidity than healthy ones, a higher concentration of phenylacetic acid, acetic acid and γ-decalactone, and a lower content of total anthocyanin and 3-mercaptohexanol (Pinar *et al,* 2017). This disease creates grey to white powdery development on grapevine particularly on leaves, curling and senescence of leaves, weakening of stems, inhibition of sprouting, cracking of fruits and stems are weakened (Singh *et al*, 2017). Powdery mildew of grape caused by an obligate fungus (*Uncinula necater*) is the only major grape disease in Kargil District, which leads to massive crop losses and poor grape quality. Fungicide use is quite low in this district and those fungicides which have developed resistance to any pathogen in other parts of the state doing well in this region at a low rate. Keeping in mind the losses caused by powdery mildew in grapes, present studies were undertaken by KVK, Kargil 1 at farmers' field.

MATERIALS AND METHODS

Two fungitoxicants, carbendazim 50 WP @ 0.1% and myclobutanil 10WP @ 0.03% were evaluated for their efficacy in the field under natural conditions of disease development during the year 2017 -18 and 2018-19. The spray was done on the appearance of disease. The evaluation of the fungitoxicants was carried out on local grape cultivar Rgon at 5 farmer's field. The experiment was laid in Randomized Block Design (RBD) with three replications for each treatment. It was found that myclobutanil 10WP proved very effective in reducing disease intensity and therefore, selected for conducting front line demonstration (FLD) at 10 farmers field in different area of the district. The disease severity was estimated by counting percentage of leaf area covered by visible powdery mildew per lesion (Wang *et al*, 1995). The data on disease intensity were recorded 15, 30, and 45 d after the spray by randomly selected 10 leaves per plant for three plants in each treatment adopting 0-7 scale (Thind *et al*, 2010) as mentioned below.

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Category	Numerical value	Per cent leaf surface area affected
I	0	No disease
II	1	0.1-5.0
III	2	5.1-15.0
IV	3	15.1-30.00
V	4	30.1-45.0
VI	5	45.1-65.0
VII	6	65.1-85.0
VIII	7	>85.0

Disease intensity was calculated by adopting the following formula of (MicKinney,1923). To managed the powdery mildew of grapes caused by *Uncinula necater,* two fungicides, myclobutanil 10WP @ 0.05% and carbendazim 50WP @ 0.1% were sprayed at the appearance of disease and data were collected fortnightly from the first spray.

RESULTS AND DISCUSSSION

In comparison to the control, both fungicides were significantly effective in reducing disease intensity. Myclobutanil 10 WP @ 5ml/10 l had its superiority and recorded lowest disease intensity of 7.0% in Sanjak followed by Garkhon (8.66 %) and Batalik (8.96%) as compared to control where disease intensity was recorded ranging between 59.13 to 62.26 per cent. The set treated with myclobutanil 10 WP provided 85.96 per cent reduction in disease intensity followed by the second sets treated with carbendazim 50 WP where disease reduction was recorded 69.44 per cent.

These findings were consistent with those of Adsule *et al* (2008), who noted that myclobutanil 10 WP significantly reduced the disease intensity of powdery mildew in grape. According to Reddy *et al* (2017), myclobutanil had a greater reduction

Table 1. Evaluation of fungicide against powdery mildew of grapes in cold arid zone of Kargil

Treatment	Location and Disease intensity (%)				Reduction over control (%)
	Garkhon	Batalik	Sanjak	Mean	
Myclobutanil 10 WP @ 0.05%	8.66	8.96	7.00	8.20	85.97
Carbendazim 50 WP @ 0.1%	18.86	21.33	17.20	19.13	69.44
Control	61.73	62.26	59.13	61.04	-
CD	2.41	1.99	1.83	1.99	-
CV	3.47	2.77	2.83	-	-

Table 2. Yield performance of grape under FLD (treated with Myclobutanil 10 WP) vs farmer's practice (FP)

Year	Yield (kg/tree) FLD	Yield (kg/tree) FP	Yield increase over farmer practice	Net return	B:C
2017-18	80.9	55.00	47.09	7,610	3.81
2018-19	81.2	55.5	46.55	7,920	3.87
Mean	81.2	55.25	46.79	7,905	3.84

in disease intensity of grape powdery mildew. DMI (DeMethylation Inhibitors**)** fungicide had an efficacy in managing the powdery mildew of grapes (Thind, 2010).

The yield of berries per vine (Table 2) during the two year was significantly higher compared to the control. It was reported 80.9 kg per vine during 2017-18 and 81.2 kg/ vine during the year 2018-19, whereas it was recorded 55 and 55.5 kg/vine during the year 2017-18 and 2018-19, respectively.

CONCLUSION

For effective management of powdery mildew, fungicide sprays may be needed early in the growing season for highly susceptible cultivars and when disease pressure from the previous year is high. Fungal spores (ascospores) are released from overwintering sites on the bark of the vine, from bud break until shortly after bloom when it is rainy and temperatures are above 50ºF. However, additional spores produced in lesions continue to be spread throughout the season by wind. The most critical time to manage fruit infection with fungicides is immediately before bloom through two to four weeks after bloom. It is important to remember powdery mildew can be a problem during dry growing seasons because fungal spores can be disseminated by wind and cause infections with high humidity alone and do not require rain for release or infection.

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