



## Comparative study of carbendazim 12% + mancozeb 63% w.p. against Leaf spot of *Vigna mungo* (Linn.) Black gram

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### Article Info

Received: 10-06-2020,

Revised: 26-08-2020,

Accepted: 15-09-2020

**Keywords:** Black gram, *Cercospora canescens*, *Fusarium equiseti*, carbendazim 12% + mancozeb 63% w.p..

### Abstract

Black gram *Vigna mungo* (Linn.) is a highly prized pulse. It is widely cultivated in many tropical and subtropical regions of the world including India. Cultivation and production of black gram showed decreased trend in last few years mainly due to the incidence of diseases. The aim of the study was to evaluate Hexaconazole in vivo against leaf spot disease causing fungi on *Vigna mungo*. This experiment was conducted to examine the efficacy of carbendazim 12% + mancozeb 63% w.p. against Leaf spot (fungal disease) on Black gram caused by *Cercospora canescens*, *Fusarium equiseti* and *Curvularia lunata* in Black gram. carbendazim 12% + mancozeb 63% w.p. was used the concentration i.e. 500 gm/0.40 hectares. The experiment was carried out during Kharif season-2019 and the experimental site exactly located on 19<sup>o</sup>.04945' latitude and 77<sup>o</sup>.684476' longitude. The results showed that carbendazim 12% + mancozeb 63% w.p. was highly effective in controlling the incidence of Leaf spot in Black gram. The results obtained in the present study revealed that all the treatments significantly increased the seed yield (712 Kg/0.40 ha) over the untreated control (472 Kg/0.40 ha). The grain yield was the highest from the experimental plots treated with carbendazim 12% + mancozeb 63% w.p. at 500gm/0.40 ha during the season. Present investigation revealed that fungicide carbendazim 12% + mancozeb 63% w.p. is potent to control the leaf spot diseases on black gram caused by various fungi and enhance grain yield and quality of the seed.

### INTRODUCTION

Black gram *Vigna mungo* (Linn.) Hepper syn. *Phaseolus mungo* Linn., non Roxb. and Auct; *Phaseolus radiates* Roxb. is a highly prized pulse. It is widely cultivated in many tropical and subtropical regions of the world including India, Iran, Malaysia, East Africa and many southern European countries. The pulse is used in rheumatism, nervous and hepatic disease. The roots of the plants are narcotic and are used for aching bones. The plant prevents soil erosion and conserves soil moisture. Cultivation and production of black gram showed decreases trend in last few

years mainly due to the incidence of diseases. The average yield of black gram is very low due to low inherent yield potential and susceptibility of crop to the disease (Thakur *et al.*, 1977). Leaf spot disease caused by *Cercospora canescence* is a serious disease in the black gram growing areas during the season (Bashir and Jubair, 1985); which is responsible for 23% losses in yield (Quebral and Cagampang, 1970). Maximum loss of 61% was observed in case of grain yield (Iqbal *et al.*, 1995). Several workers had reported the effective control of the disease with the application of fungicides (Singh and Naik, 1977; Singh and Singh, 1978).

**MATERIALS AND METHODS**

The experiment was conducted during 24<sup>th</sup> June to 12<sup>th</sup> September 2019 (i.e. Kharif season) at 19<sup>o</sup>.04945' latitude and 77<sup>o</sup>.684476' longitude at Ganipur Tq. Umri Dist. Nanded (M.S.) to evaluate the efficacy of carbendazim12% + mancozeb 63% w.p. against leaf spot disease in black gram. The black gram variety (Eagle black seed) selected for the study and sowing was done on 24<sup>th</sup> June 2019 at a spacing 30 cm and 10 cm between rows and plants respectively.

The first spray was taken up after initial appearance of the disease in the treated crop field and further sprays were done at an interval of 15 days with 'High Tech' sprayer @ 250 lit/0.40 hector for through coverage of foliage with sprayer fluid. The severities of leaf spot were recorded one day before the every spray standard rating scales during the season in both the fields. Percent Incidence (PI)

of the disease was calculated for Leaf spot. The yield was recorded from each net plot band computed to yield in 100 Kg/hector.

**RESULTS AND DISCUSSION:**

During the experimental period the data regarding the incidence of leaf spot was presented (Table 1). The results showed that the fungicides, carbendazim12% + mancozeb 63% w.p.at the concentration 500gm/0.40 ha was found effective against leaf spot. The Percent Incidence (PI) of the leaf spot was nearly constant during the season in treated plot, since the incidence of leaf spot was very rare in the treatment compared with untreated control. Severe incidence of leaf spot was observed in untreated control plots during the season. Hence, it was evident that carbendazim12% + mancozeb 63% w.p. was highly effective in controlling the incidence of leaf spot in black gram.

**Table 1:** Efficacy of carbendazim12% + mancozeb 63% w.p. against leaf spot of urdbean during Kharif season -2019.

Treatment	PI (Percent Incidence) of leaf spot disease during 4 sprays					Yield Kg/0.40 ha
	I <sup>st</sup> spray (After 25day)	II <sup>nd</sup> spray (After 40 day)	III <sup>rd</sup> spray (After 55day)	IV <sup>th</sup> spray (After 70day)	Mean	
Hexaconazole 5% Sc 400ml/0.40ha	11.16	9.79	6.37	9.27	9.14	712
Untreated Plot	10.75	12.93	19.37	26.39	17.36	472

The results obtained in the present study revealed that all the treatments significantly increased the seed yield (712 Kg/0.40 ha) over the untreated control (472 Kg/0.40 ha). The grain yield was the highest from the experimental plots treated with carbendazim12% + mancozeb 63% w.p. at 500gm/0.40 ha during the season. The fungicidal treatments not only increased the yield but grain quality was also superior as compared to uncontrolled plot.

The test compound, carbendazim12% + mancozeb 63% w.p. was proved effective against leaf spot diseases. the efficacy of hexaconazole against foliar fungal diseases in different crops was well documented. Dadke (1996) reported that hexaconazole (0.05%) was effective in controlling the rust in soybean among various fungicides. Similarly, Patil and Anahosur (1998) reported that hexaconazole at 0.1% sprayed at 15 days interval starting from the onset of disease was found effective in reducing severity of soybean rust with significant increase in seed yield. Nagaraja and

Naik (1998) reported the efficacy of triazoles such as propiconazole, penconazole and difenconazole against powdery mildew of pea. Similarly, Khunti *et al.*, (2002) observed that penconazole and hexaconazole effectively minimized the disease intensity of powdery mildew and increased the yield to considerable extent in green gram.

The Percent Incidence (PI) of leaf spot nearly constant during the season over treated field and it increasingly trend over untreated field. The percent incidence of leaf spot nearly same at the time of first spray, but from second spray percent incidence of leaf spot increase on untreated plot. On untreated plot percent incidence of leaf spot 12.93%, 19.37% & 26.39% after II<sup>nd</sup>, III<sup>rd</sup> & IV<sup>th</sup> spray as compare to treated plot 9.79%, 6.37% & 9.27% after II<sup>nd</sup>, III<sup>rd</sup> & IV<sup>th</sup> spray respectively. Mean of percent incidence of leaf spot on untreated plot is double 17.36% as compare to treated plot 9.14%. The yield of both plot are completely different, untreated plot loss of yield due to disease incidence as compare to treated plot. Finally yield count both of the plot its 712kg &

472kg per 0.40 ha. in treated & untreated plot respectively. During this investigation the *Cercospora canescence* causes leaf spot on black gram crop. *Cercospora* leaf spot is a devastating disease that causes qualitative and quantitative losses to the crop (Sivprakasam, 1983). The *Cercospora* leaf spot disease well-defined spots often bound by veins and purplish border develop, the centres of which may turn grey, it appearing about 5-6 weeks after planting, depending upon the weather condition mostly temperature and humidity. It also caused premature defoliation and reduction in size of pods and grains (Grewal et al., 1980).

*Curvularia lunata* (Wakker) was isolated from the infected leaves and pods of black gram. The spotting is mostly confined to leaf blades; occasionally it occurs on the pods and floral parts. It might be due to the availability of infected test crop, dead and decaying materials and favourable weather condition. However, continuous rain affected the incidence of *Curvularia* spores in the air (Mallaiah and Rao, 1980). The presence of *Fusarium* spores in air over test field might be due to the prevalence leaf spot and top necrosis disease in untreated fields. *Fusarium equiseti* caused the leaf spot and top necrosis on black gram crops in untreated field. The incidences of disease occur after 4-5 weeks from the date of sowing.

#### Conclusion:

Present investigation revealed that fungicide carbendazim 12% + mancozeb 63% w.p. is potent to control the leaf spot diseases on black gram caused by various fungi and enhance grain yield and quality of the seed.

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#### How to cite this article

**Vilas Balajirao Ganipurkar, 2020.** Comparative study of carbendazim 12% + mancozeb 63% w.p. against Leaf spot of *Vigna mungo* (Linn.) Black gram. *Bioscience Discovery*, **11**(4):255-257.

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