

Fungicidal Management of Lentil Rust (*Uromyces fabae* (Pers.) de bary)

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ABSTRACT

The present study was conducted during Rabi, 2014-15 at farmer's field of villages Bhandar, Luxmipur, Nimoya, Madhopur, Meerpur, Jeetpur, Sarupa, Chainpur, Jhauaram and Dhaka of East Champaran district to test the efficacy of fungicides in controlling Rust diseases of Lentil. Results revealed that seed treatment with Propiconazole 25 EC @ 1 ml/kg seed + two sprays of Propiconazole 25 EC @ 1 lit/ha at 15 days interval recorded highest reduction of rust disease severity and was followed by seed treatment with Mancozeb 75 WP @ 2 g /kg seed + two foliar sprays of Mancozeb 75 WP @ 2 kg/ha at 15 days intervals. Highest percentage of disease severity was recorded with Farmers Practice plot.

Key words: Lentil, Rust, Seed treatment, Fungicides, Yield

INTRODUCTION

Lentil (*Lens culinaris* Med.) is most important Rabi pulse crop of Bihar. It is a valuable human food, mostly consumed as dry seeds (whole decorticated, seed decorticated and split). In Indian sub-continent mostly consumed as 'Dal' by removal of outer skin and separation of cotyledons, snacks and soup preparation etc. It is easy to cook and easily digestible with high biological value, hence also referred to patient. Lentil is an excellent source of diet which contain protein concentration ranging from 22-34.6 per cent and 100 g dried seeds contain 340-346 kcal, 20.2 g protein, 0.6 g fat, 65.0 g total carbohydrates, about 4 g fibre, 2.1 g ash, 68 mg Ca, 325mg P, 7.0 mg Fe, 29 mg Na, 780 mg K, 0.46 mg thiamine, 0.33 mg riboflavin

and 1.3 mg niacin (Muehlbauer et al., 1985; Adsule et al., 1989). Dry leaves, stems, empty and broken pods are used as valuable cattle feed.

The wide gap between the attainable yield potentials and farmers field are due to various biotic, abiotic and socio-economic factors. Despite the potential for lentil crops in agriculture, they still face challenges due to competition from weeds, insect attack, disease incidence, and instability of productivity and a lack of successful nodulation.

Rust of lentil caused by *Uromyces fabae* is regarded as the most important foliar disease of lentil. The disease occurs during the flowering/early podding stage and causes substantial yield losses ranging from 60-90 % (Sepulveda, 1985).

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Complete crop failure can occur due to this disease. The disease can be controlled by applying a number of management strategies including biological, cultural, chemical and planting resistant varieties (Marshi et al., 1982). Among these, use of resistant varieties and application of fungicides are more effective. Considering above point, this on farm trial was undertaken at farmer's field of East Champaran district to test the efficacy of some fungicides in controlling rust diseases of lentil.

MATERIALS AND METHODS

The present study was conducted during Rabi, 2014-15 at farmers field of villages Bhandar, Luxmipur, Nimoya, Madhopur, Meerpur, Jeetpur, Sarupa, Chainpur, Jhauaram and Dhaka of East Champaran district. This experiment was planned in Randomized Block Design with four treatments including Farmer's Practice each replicated ten times with plot size of one acre. The soil of the farmer's field was sandy loam in texture. Three different fungicides were tested during experimentation. The treatments contains T₁- (FP) one spray of Carbendazim 50% wp @ 1.0 kg/ha, T₂-Seed treatment with Propiconazole 25 EC @ 1 ml/kg seed + two sprays of Propiconazole 25 EC @ 1 lit/ha at 15 days intervals, T₃-Seed treatment with Mancozeb 75wp @ 2 gm/kg seed + two sprays of Mancozeb 75wp @ 2

kg/ha at 15 days interval. Lentil variety HUL 57 was selected for the study. The crop was sown manually with spacing of 30 cm and 10 cm between rows and plants, respectively. The crop was fertilized with basal dose of 20, 60 and 30 kg N,P and K /ha respectively. The crop was protected from the infestation of both sucking pests and pod borers through blanket application of selective insecticides in all experimental field uniformly to avoid the yield losses due to insects.

Per cent disease Index (PDI): Plants were observed over time to investigate the rust severity under natural conditions. Data were recorded on the basis of symptoms. Disease severity data were recorded two times for each treatment with one before application of fungicides. The time interval was maintained as 15 days. First spray of fungicides as per treatments, was taken up after initial appearance of disease in crop and further sprays were given at 15 days interval with knap sack sprayer at the rate of 700-800 lit. of spray fluid per hectare for thorough coverage of foliage with spray fluid. The severity of rust were recorded from four randomly selected area of each plot with the help of 1 m² quadrat and is expressed in term of percentage. After each observations, their mean percentage was calculated by using following formulae. Yield q/ha. and benefit :cost ratio was also worked out.

$$\text{Percent Disease Incidence (PDI) \%} = \frac{\text{Number of Plant Infected by Diseases} \times 100}{\text{Total no. of Plants observed} \times \text{Maximum rating}}$$

RESULT AND DISCUSSION

The results presented in table -1 revealed that all the tested fungicides was found effective against rust disease and also found significant over farmers practice. The mean per cent rust disease severity was ranged from 23.42 % to 38.72% in different experimental treatments. Lowest disease severity of lentil rust (23.42%) and highest grain yield q/h (10.84) with cost benefit ratio 3.38 was recorded in case of seed treatment with Propiconazole 25EC @ 1 ml/kg seed + two foliar sprays of

Propiconazole 25EC @ 1 lit/ha. (1st spray 11 week after planting and 2nd spray 15 days after 1st spray followed by Seed treatment with Mancozeb 75WP@ 2 gm/kg seed + two foliar sprays of Mancozeb 75WP@ 2 kg/ha recorded 29.64 % disease severity and grain yield 7.57 q/ha. Rahman et al. (2005) and Ahmad et al. (2006) also reported that Tilt 25 EC (Propiconazole) @ 0.05 per cent was the most effective fungicide against rust disease. Maximum disease severity (38.72%) of rust and lowest grain yield q/h (5.25) was recorded

in case of one spray of Carbendazim 50 % WP @ 1.0 kg/ha i.e. in farmers management practice (FP). This result emphasize the need

to spread the adoption of seed treatment plus two foliar spray of Propiconazole 25 EC among lentil grower against this disease.

Table 1: Efficacy of fungicides against Lentil Rust caused by *Uromyces fabae*.

Treatments	Percent Disease Index (PDI)	% Disease reduction over Farmers Practice (FP)	Yield (q/h)	Cost of cultivation (Rs/h)	Gross return (Rs/h)	Net return (Rs/h)	B:C ratio
T ₁ -(FP) one spray of Carbendazim 50% wp @ 1.0 kg/ha	38.72	-	5.25	12700.00	23625.00	10925.00	1.86
T ₂ . Seed treatment with Propiconazole 25 EC @ 1 ml/kg seed + two sprays of Propiconazole 25 EC @ 1 lit/ha	23.42	65.32	10.84	14400.00	48780.00	34380.00	3.38
T ₃ . Seed treatment with Mancozeb 75wp @ 2 gm/kg seed + two sprays of Mancozeb 75wp @ 2 kg/ha	29.64	30.63	7.57	12920.00	34065.00	21145.00	2.63
S.Em (+_)	2.30		1.12				
CD at 5%	5.76		2.11				

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