

## Effect of Various Manurial Application on the incidence of Brown Spot of Rice

**Key words :** Brown spot of rice, Grain infection, Leaf infection.

Brown spot of rice incited by *Drechslera oryzae* (Breda de Hann) Subram and Jain is one of the serious diseases of rice and is known to occur in most rice growing areas of the world. In India, it occurs more or less every year in mild or severe form. Three types of infection caused by the pathogen results in yield loss. The first is due to poor germination of infected seed, the second is leaf infection resulting in the reduction of effective leaf surface and third is the attack on the grains leads to shrivelling and discolorations. Ghosh *et al.*, (1960) recorded the yield loss up to 90 per cent in West Bengal during 1942. Keeping in view the economic importance and heavy losses inflicted by the disease, the present investigation aims to study the effect of different manurial applications on the incidence of brown spot disease on leaves and grains of two cultivars of rice.

The incidence of the brown spot on leaves and grains were recorded on two cultivars of rice viz., PTB-2 (Tall indica) and Jaya (Dwarf indica) in the on going permanent manurial trial laid out in a randomized block design during *Kharif* 2000 and 2001 seasons at Regional Agricultural Research Station, Pattambi. The disease severity on leaf was scored by Standard Evaluation System (IRRI 1996). 0 – no incidence, 1 – <1% leaf infection, 2 – 1-3% leaf infection, 3 – 4-5% leaf infection, 4 – 6-10% leaf infection, 5– 11-15% leaf infection, 6 – 16-25% leaf infection, 7 – 26-50% leaf infection, 8 – 51-75 % leaf infection, 9 – 76-100% leaf infection one month before harvest by choosing five leaves each on five randomly selected hills and the per cent grain infection was recorded at the time of harvest by selecting five ear heads at random in each plots. The treatments for the traditional variety PTB-2 were cattle manure (CM) 8000 kg/ha to supply 40 kg N/ha ( $T_1$ ), green leaves (GL) 8000 kg/ha to supply 40 kg N/ha ( $T_2$ ), CM + GL 4000 kg each to supply 40 kg N/ha ( $T_3$ ), ammonium sulphate to supply 40 kg N/ha ( $T_4$ ), CM 4000 kg/ha + 20:20:20 kg N,  $P_2O_5$  and  $K_2O$ /ha ( $T_5$ ), GL 4000 kg/ha + 20:20:20 kg N,  $P_2O_5$  and  $K_2O$ /ha ( $T_6$ ), CM + GL each 2000 kg/ha + 20:20:20 kg N,  $P_2O_5$  and  $K_2O$ /ha ( $T_7$ ) and 40:20:20 kg N,  $P_2O_5$  and  $K_2O$ /ha ( $T_8$ ). For the high yielding variety Jaya, the treatments included were cattle

manure (CM) 18,000 kg/ha to supply 90 kg N/ha ( $T_1$ ), green leaves (GL) 18,000 kg/ha to supply 90 kg N/ha ( $T_2$ ), CM + GL each 9000 kg/ha to supply 90 kg N/ha ( $T_3$ ), ammonium sulphate to supply 90 kg N/ha ( $T_4$ ), CM 9000 kg/ha + 45 kg N, 45 kg  $P_2O_5$  and 45 kg  $K_2O$ /ha ( $T_5$ ), GL 9000 kg/ha + 45 kg N, 45 kg  $P_2O_5$  and 45 kg  $K_2O$ /ha ( $T_6$ ), CM + GL each 4500 kg/ha + 45 kg N, 45 kg  $P_2O_5$  and 45 kg  $K_2O$ /ha ( $T_7$ ) and 90:45:45 kg N,  $P_2O_5$  and  $K_2O$ /ha ( $T_8$ ). In all the cases the inorganic source of N, P and K were applied as ammonium sulphate, super phosphate and muriate of potash respectively. Cattle manure and green leaves were applied ten days before transplanting. P and K were applied as basal while half the dose of N was applied as basal and the remaining half applied one month before flowering. *Glyricidia maculata* was used as green manure.

### Leaf Infection

In the variety PTB-2, the combined application of cattle manure and green leaves (4000 kg each) recorded lower leaf infection which was found on par with cattle manure (8000kg/ha), cattle manure 4000 kg/ha + 20:20:20 kg N,  $P_2O_5$  and  $K_2O$ /ha and green leaves 4000 kg/ha + 20:20:20 kg N,  $P_2O_5$  and  $K_2O$ /ha applications. In the case of Jaya, leaf infection was lower in cattle manure (18,000 kg/ha) application which was found on par with cattle manure + green leaves (9000 kg/ha each), cattle manure 9000 kg/ha + 45: 45:45 kg N,  $P_2O_5$  and  $K_2O$ /ha applications.

### Grain infection

In PTB-2, lowest grain infection was recorded in cattle manure 8000 kg/ha applied plots. This was found on par with combined application of cattle manure + green leaves (4000 kg each) and ammonium sulphate to supply 40 kg N/ha applied plots. But in the case of Jaya, lowest grain infection was recorded in cattle manure 18,000 kg/ha applied plots and was found on par with cattle manure 9000 kg/ha + 45:45:45 kg N,  $P_2O_5$  and  $K_2O$ /ha and cattle manure + green leaves (4500 each) + 45:45:45 kg N,  $P_2O_5$  and  $K_2O$ /ha applied plots. Padmanabhan (1963) reported that soil amendments or foliar sprays which restore the balance and make the deficient

Table 1. Effect of various manurial applications on the incidence of brown spot of rice (pooled data of two seasons) and yield kg ha<sup>-1</sup>

Treatments	PTB-2		Jaya		Yield (kg ha <sup>-1</sup> )	
	Leaf Infection (%)	Grain Infection (%)	Leaf Infection (%)	Grain Infection (%)	PTB-2	Jaya
T <sub>1</sub>	5.64 (13.69)	21.52 (27.63)	1.17 (6.02)	7.15 (14.45)	2555.40	2869.90
T <sub>2</sub>	7.09 (15.45)	43.48 (41.27)	4.03 (11.54)	19.54 (26.21)	2196.30	2105.10
T <sub>3</sub>	5.32 (13.31)	27.34 (31.50)	2.57 (9.10)	20.50 (26.92)	25.36.01	2839.00
T <sub>4</sub>	6.68 (14.89)	27.39 (31.50)	4.37 (11.97)	19.62 (26.28)	2074.50	1873.20
T <sub>5</sub>	6.06 (14.30)	31.68 (34.20)	2.77 (9.46)	12.03 (20.27)	2473.40	2835.30
T <sub>6</sub>	6.45 (14.77)	40.60 (39.58)	4.49 (12.11)	19.14 (25.92)	2255.80	2016.10
T <sub>7</sub>	6.85 (15.23)	43.22 (41.09)	4.05 (11.54)	13.42 (21.47)	2338.30	2380.90
T <sub>8</sub>	6.98 (15.23)	44.58 (41.90)	4.13 (11.68)	15.81 (23.42)	2282.80	2059.60
CD (5%)	1.29	9.14	1.81	6.92	267.32	302.16

Figures in the parentheses are arc sine transformed values

ions available to the crop are a possible approach to avoid serious losses caused by brown spot disease.

#### Yield

In both the varieties cattle manure application (8000 kg/ha for PTB-2 and 18,000 kg/ha for Jaya) recorded higher yield. This was found on par with cattle manure + green leaves (4000 kg/ha each) and cattle manure 4000 kg/ha + 20: 20: 20 kg NPK/ha in PTB-2 and cattle manure 4500 kg/ha + 45: 45:45 kg NPK/ha in Jaya applied plots.

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Regional Agricultural Research Station  
Pattambi- 679 306  
Kerala Agricultural University.

**S M Purushothaman**  
**S Anitha**  
**C Beena**  
**K Kathikeyan**  
**P V Balachandran**

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