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Management of Foliar Blight (Spot Blotch) of Wheat the Most Threatening Disease of North Eastern Plain Zone (NEPZ) through Chemicals

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1. INTRODUCTION

Spot blotch of wheat caused by *Bipolaris sorokiniana* (Sacc.) Shoem has been a major disease of wheat grown under humid subtropical climate (Duveiller, 2002; Roshyara *et al.*, 2009). The disease has a special significance in eastern Gangetic plains of South Asia that includes India, Nepal and Bangladesh (Sharma and Duveiller, 2004; Joshi *et al.*, 2007). The average yield losses due to spot blotch in India were reported to be 17 percent (Saari, 1998). Therefore, concerted efforts are needed to intensify the research on enhancing the productivity in terms of per unit area on ecologically and economically sustained basis. In this regard due emphasis needs to be given on management of both biotic and abiotic stresses which cause severe loss. Repeated and indiscriminate use of same fungicides often leads to development of fungicide resistance in pathogen (Gangawane, 1997). The variety which is resistant today becomes susceptible in course of time due to development of new physiological races of the same pathogen. Therefore advocating suitable fungicides and the manner in which it has to be used by the farmer and at which stage its application, gives maximum benefit was the objective behind carrying this experimentation.

2. MATERIALS AND METHODS

A field study was conducted for two consecutive years (2011-12 and 2012-13), during *rabi* season at IARI Regional Station Pusa Bihar under natural field condition. The variety HUW 234 which is highly susceptible to spot blotch was used for the study in both the years. Ten treatments of fungicides with one check were laid out in randomized block design (RBD) with three replications. The plot size was maintained at 5 x 1.5 sq.m. and recommended agronomic practices were followed to raise the crop. Four fungicides namely Captan 50% WP, Propiconazole 25% EC, Tebuconazole 25% EC and Mancozeb 75% WP and another two fungicides mixture Carboxin 37.5% + Thiram 37.5% were applied in the field in different mode with a different spraying schedule. The ten different treatments were, T1 = untreated control, T2 = seed treatment by Captan50%WP @ 3gm kg-1 seed, T3 = seed treatment by Carboxin 37.5% + Thiram 37.5%WS @ 2.5gm kg-1 seed, T4 = seed treatment by Carboxin 37.5% + Thiram 37.5%WS @2.5gm kg-1 seed + one foliar spray of Propiconazole 25%EC @0.1% at boot leaf stage, T5 = seed treatment by Carboxin 37.5% + Thiram 37.5%WS @2.5gm kg-1 seed + two foliar sprays of Propiconazole 25% EC @0.1% one at boot leaf stage and 20 days after 1st spray, T6= one foliar spray of Propiconazole 25%EC @0.1% at boot leaf stage, T7= two foliar sprays of Propiconazole 25% EC @ 0.1% one at boot leaf stage and 20 days after 1st spray, T8= one foliar sprays of Tebuconazole 25%EC @0.1% at boot leaf stage, T9= two foliar sprays of Tebuconazole 25%EC @0.1% one at boot leaf stage and 20 days after 1st spray, T10= three foliar sprays of Mancozeb 75%WP @ 0.25% one at boot leaf stage and 2nd and 3rd at 10 days interval. The disease data was recorded in three stages (flowering, dough and hard dough) from randomly selected 25 plants from each plot tagged. So, 25 plants plot-1 were tagged for disease rating using the double digit scale (00-99) developed (Eyel *et al.,* 1987).

3. RESULTS AND DISCUSSION

The results showed that all the treatments reduced the disease severity as evident from the double digit score as well as increased the yield (seed weight /plot)) and yield parameters like 1000 grain weight (g) in comparison to untreated control. The two years data of all the parameters showed differential reaction significantly may be due to different environmental conditions. So, all the recorded parameters of two years data has been presented separately. The results showed that all the fungicides applied plots reduced the disease incidence as well as severity significantly in comparison to untreated control irrespective of their mode of applications. Seed treatment by Carboxin 37.5% + Thiram 37.5% WS @ 2.5gm kg-1 seed resulted in enhancing the germination of the seeds as well as

reduction in number of seedling blighted plants as is evident from the table 1 and 2 of both the years and fig1a and fig 1b.

Grain yield (plot/ha): The effect of different fungicides also reflected on yield attributes like grain yield as well as in 1000 grain weight. All the treatments showed increase in the yield attributes to untreated control and were negatively correlated with the disease data, in both the two years.The grain yield was recorded more in the year 2012- 13 and it may be due to less disease severity as comparison to the year 2011-12. In both the years (2011-12 and 2012-13) the maximum grain yield*(plot/ha)* was harvested in T5 (Seed treatment by Carboxin 37.5% + Thiram 37.5% WS @ 2.5gm kg-1 seed + two foliar sprays of Propiconazole 25% EC @0.1% one at boot leaf stage and 20 days after 1st spray) (3.96kg and 4.67 respectively) followed by T7 two foliar sprays of Propiconazole 25% EC @ 0.1% one at boot leaf stage and another 20 days after 1st spray (3.51Kg and 4.29Kg respectively).

Thousand Grain weight (g): Yield attribute like 1000 grain weight (g) also showed the same trends as observed in grain yield. Both the years (2011-12 and 2012-13) maximum 1000 grain weight was observed in T5 (46.1 and 46.8 respectively) followed by T7 (44.3 and 44.6 respectively) (Table 1&2).

Table 1.: Evaluation of different fungicides in management of spot blotch in wheat in the year 2011-12 at IARI Regional station Pusa (Bihar)

SI. No.	*Observations	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
1.	Seed germination at 20 days after sowing	91	93	96	96	96	91	91	91	91	91
2.	Seedling blight (Nos)/plot	14	11	6	6	5	10	11	10	11	12
3.	Record of foliar blight at flowering stage	34	23	12	12	12	23	23	24	23	24
	DOUGH stage	46	34	24	23	23	34	34	35	34	35
	Hard dough stage	67	57	46	35	34	47	46	47	46	57
4.	Seed weight/plot (Kg)	2.75	2.92	3.18	3.45	3.96	3.32	3.51	3.27	3.48	3.29
5.	1000 grains weight (gm)	40.5	41.3	42.7	43.6	46.1	43.1	44.3	42.9	43.8	43.1

Mean of three replications

Table 2.: Evaluation of different fungicides in management of spot blotch in wheat in the year 2012-13 at IARI Regional station Pusa (Bihar)

SI. No.	*Observations	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
1.	Seed Germination at 20 days after sowing	92	94	97	97	97	92	92	92	92	92
2.	Seedling blight (Nos)/plot	11	8	4	3	4	4	3	4	4	4
3.	Record of foliar blight at flowering stage	23	23	12	12	12	23	23	23	23	24
	DOUGH stage	45	34	23	23	23	34	34	34	24	35
	Hard dough stage	57	46	45	35	24	46	45	46	45	46
4.	Seed weight/plot (Kg)	2.95	3.17	3.68	4.25	4.67	4.13	4.29	4.15	4.21	3.85
5.	1000 grains weight (gm)	41.2	42.5	43.7	44.6	46.8	43.8	44.6	44.2	45.1	44.2

Mean of three replications

where; T1 = Untreated control, T2 = Seed treatment by Captan50%WP @3gm/kg seed, T3 = Seed treatment by Carboxin 37.5% + Thiram 37.5%WS @2.5gm/kg seed, T4 = Seed treatment by Carboxin 37.5% + Thiram 37.5%WS @2.5gm/kg seed + one foliar spray of Propiconazole 25%EC @0.1% at boot leaf stage,T5 = Seed treatment by Carboxin 37.5% + Thiram 37.5%WS @2.5gm/kg seed + two foliar sprays of Propiconazole25%EC @0.1% one at boot leaf stage and 20 days after 1st spray, T6= one foliar spray of Propiconazole 25%EC @0.1% at boot leaf stage, T7= two foliar sprays of Propiconazole25%EC @0.1% one at boot leaf stage and 20 days after 1st spray, T8= one foliar sprays of

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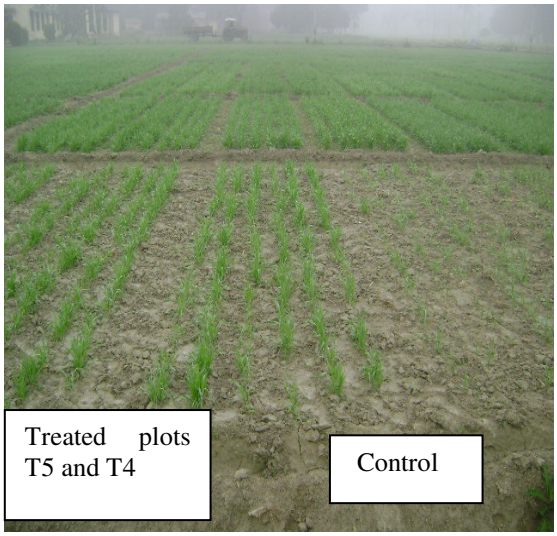

Fig 1. a

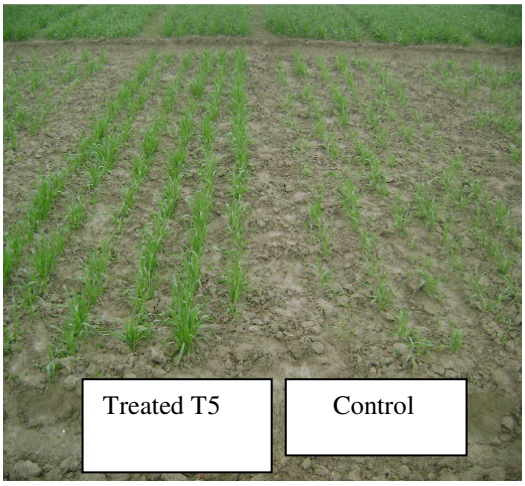

Fig 1b.

4. CONCLUSIONS

The result therefore indicated that seed treatment by Carboxin 37.5 percent + Thiram 37.5 percent WS @ 2.5gm kg-1 seed + two foliar sprays of Propiconazole 25 percent EC @ 0.1percent one at boot leaf stage and 20 days after 1st spray gave best result in reducing the spot blotch of wheat as well as increasing the 1000 grain weight and grain yield of wheat. Only two foliar sprays of Propiconazole 25 percent EC @ 0.1 percent one at boot leaf stage and 20 days after 1st spray also gave good result in reducing the spot blotch of wheat. This result also confirmed the findings of (Sunita Mahapatra and Saikat Das2013). Therefore a combination of seed treatment by Carboxin (37.5%) + Thiram (37.5%WS) @2.5gm kg-1 seed + two foliar sprays of Propiconazole 25 percent EC @0.1percent one at boot leaf stage and another 20 days after 1st spray can be advocated to farmersagainst spot blotch of wheat based on findings in two years experimentation conducted at IARI regional station Pusa Bihar.

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