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EFFECT OF FUNGICIDES AND SILICA IN THE CONTROL OF SHEATH BLIGHT DISEASE OF RICE CAUSED BY *CORTICIUM SASAKII* (SHIRIAI)*

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Sheath blight, incited by *Corticium sasakii* (*Shiriai*) Matsumoto, has become one of the serious diseases of rice especially of high yielding varieties in Kerala. Considering the importance of the disease a study was conducted to determine the effect of fungicides under different levels of silica and to assess the role of silica in imparting resistance to infection.

Materials and Methods

Thestudywas conducted at the Agricultural College, Vellayani, Kerala during the crop season February to May 1974 in 9 x 3 Randomised replicated plots of size 5.4 x 4.4 m. Three levels of silica in the form of sodium silicate was given as basal dressing @ 0, 250, and 500 kg/ha. Annapurna, a variaty of rice susceptible to the disease was used in the trial. Dolomite @ 1000 kg/ha was supplied five days prior to transplanting. NPK was applied @ 90:45:45, Nitrogen being given in two split doses. The plants were given three spraying with Hinosan (0.04%) and Dithane M–45 (0.3%) when the plants were 40, 55 and 70 days old. Observations on disease intensity were taken on the 40th, 60th, 75th and 85th day of sowing. Samples of plant materials were collected on 40th, 60th and 80th day and analysed for crude silica content by the method described by Yoshida *et al.* (1972).

Results and Discussion

Eventhough rice plant was reported to be susceptible to the disease at all stages of its growth, the incidence of the disease was not noticed upto the 60th day in the present study.

The results of observation on the intensity of the disease (Table 1) indicated that there was significant difference in the effect of fungicides and the intensity was the lowest in the plots treated with Hinosan. Similar response was reported from I.R. R. I., Philippines (Anon., 1974). From the observations noted on the 75th day (Table 1) it was found that there was significant reduction in intensity due to the application of silica eventhough the difference between the higher and lower level was not statistically significant. However the disease intensity recorded on the 85th day showed negative response to the application of silica.

The effect of fungicides on the yield of grain was significant under the different levels of silica (Table 2). The plots treated with Hinosan recorded a

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Table 1

Effect of fungicides on the intensity of infection of sheath blight at three levels of silica

Fungicides	Levels of silica							
	No silica		250 kg/ha		500 kg/ha		Mean	
	75th day	85th day	75th day	85th day	75th day	85th day	75th day	85th day
Hinosan	0248	0,633	0.199	0.347	0.198	0.436	0.215	0.472
Dithane M–45	0.615	0.942	0.555	1.001	0.571	0.775	0.580	0.906
No fungicides (Control)	1.110	1.620	0.565	1.684	0.680	1.149	0.785	1.484
Mean	0.658	1.065	0.440	1.011	0.483	0.786	–	–

	75th day	*85th day*
CD (5%) for comparision between marginal mean:	0.139	0.353
CD (5%) for comparision between combinations of silica and fungicides	0,242	0.611

Table 2

Effect of fungicides at three levels of silica on the yield of rice (kg/ha)

Fungicides	Levels of silica						Mean	
	No silica		250 kg/ha		500 kg/ha			
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
Hinosan	3306.7	3500.0	3391.7	3416.7	3882.5	4333.3	3526.9	3570.0
Dithane M-45	3101.7	3166.7	3130.0	3333.3	3200.0	4083.2	3143.9	3527.8
No fungicide (control)	28308	2833 3	2824.3	3166.7	2959.2	3833.3	2871 4	3277.8
Mean	3079.7	3166.7	3115.3	33055	3347.2	4083.3	—	—

	Grain	*Straw*
CD (5%) For comparision berween marginal means	143.950	184.440
CD (5%) For comparision between combinations of silica and fungicides.	249.550	319.450

higher yield over control. The increase in grain yield may be attributed to the reduction of disease intensity on the 75th day (Table 1). The trend in yield of straw was also the same as grain yield although the difference was not significant at the lower level of silica. An increase in the yield of grain and straw was observed at the higher level of silica while the yield in the lower level wason par with control.

Plant analysis showed a high per cent of crude silica at the active tillering phase (40th day) and at the milky or dough stage (80th day) with a decrease during the 60th day at the time of formation of flower primordia and stem elongation (Table 3), Similar results were obtained by Ishisuka (1964). The study also revealed a significant increase in crude silica content with incremental doses of silica fertilizer which is in confirmity with the findings of Volk *et at.* (1958).

Table 3

Silica content of plant material at different growth stages (mg/gm)

Date of observation	Levels of silica			Mean	CD (5%)
	No silica	250*kg/ha*	*500 kg/ha*		
40th day	69,22	75.44	95.33	80.00	5.49
60th day	45.55	50.11	65.55	56.74	3.82
80th day	60.56	64,67	69,33	64.85	1.92
Mean	55.18	65.52	76.44	—	—

Summary

Results of field experiments conducted at Vellayani, Kerala during 1974 indicated that Hinosan was significantly superior in reducing sheath blight disease intensity and in increasing the yield of rice due to better disease control. Application of silica (250 and 500 kg/ha) had significant effect in reducting the disease intensity on the 75th day of sowing. Crude silica content in the plant was high at the 40th and 80th day of sowing but was low on the 60th day. Positive correlation was observed between the amount of applied silica and the crude silica content of plant,

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നെല്ലിന്റെ പോളരോഗം നിയന്ത്രിക്കുന്നതിനു ഹിനോസാൻ എന്ന കുമിൾരോഗസംഹാരി (0.04%) താരതമ്യേന കൂടുതൽ ഫലപ്രദമാണെന്നു കണ്ടു. സിലിക്കാ സോഡിയം സിലിക്കേറ്റ് രൂപത്തിൽ (ഹെക്ടറിന് 250, 500 കിലോഗ്രാം വീതം) നൽകിയപ്പോൾ രോഗത്തിന്റെ രൂക്ഷത ഗണ്യമായി കുറഞ്ഞിരുന്നു.

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References

Anonymous 1974 *International Rice Research Institute,* 1974. Annual Report for 1973, Los Banes, Philippines.

Ishisuka, Y, 1964. Nutrient uptake at different stages of growth. The mineral nutrition of the rice plant. *Proc. Symp. I. R. R. I.*, Philippines, pp. 199—217.

Volk, R. J., Kahn, R. P. and Weintraub. R. L. 1958. Silicon content of the rice plant as a factor influencing its resistance to infection by the blast fungus, *Pyricularia oryzae. Phytopathology,* 48, 179-184.

Yoshida, S., Farno, D. A., Oock J. H, and Gomez, K. A, 1972. *Laboratory Manual for Physiological Studies* of Rice, I. R. R. I., Philippines, pp, 70.

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