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**EFFICACY OF FUNGICIDES AGAINST LEAF RUST OF
AROMATIC CYMBOPOGONS CAUSED BY *PUCCINIA
NAKANISHIKII* (DIET).**

***Phatik Tamuli¹, Mamoni Saikia² and Paran Boruah³**

¹*Division of Medicinal Aromatic and Economic Plants*

North East Institute of Science and Technology, Jorhat – 785 006, Assam, India.

²*Department of Botany, Darrang College, Tezpur, Assam, India.*

³*Department of Botany, D K D College, Dergaon, Assam, India.*

**Author for Correspondence*

ABSTRACT

An investigation was carried out to study the efficacy of fungicides against leaf rust of *Cymbopogons* caused by *Puccinia nakanishikii* (Diet). Five fungicides, viz., Bayer 5072 70 WP, Bayleton 25 WP, Vitavax 75% wp, Bayton 15 SD, Furavax 7.5% WP at two different concentrations (0.1% & 0.2%) were evaluated to control rust diseases of *Cymbopogon martinii* (Roxb.) Wats and *Cymbopogon citratus* (DC) Stapf. Results indicated that Bayleton at 0.1% exhibited good control of the disease with 3.25% and 6.25% disease intensity in *C. martinii* and *C. citratus* respectively. Other fungicides were not effective in controlling the disease.

Key words : *C. martinii*, *C. citratus*, fungicide, Leaf Rust, *Puccinia nakanishikii*

INTRODUCTION

Cymbopogon martinii (Roxb) Wats (Palmarosa) and *Cymbopogon citratus* (DC) Stapf. (Lemongrass) are essential oil bearing aromatic plants belonging to the genus *Cymbopogon*. The oil of *Cymbopogon martinii* is used as base for fine perfumery and is valued because of its geraniol contents. Besides the perfumery value, the oil has a great wound healing effect. *Cymbopogon citratus* is one of the sources of citral, an important monoterpene aldehyde, large quantity of which are being utilized for production of ionones, vitamin A and geraniol besides the use in perfumery soaps and cosmetics .

Although *C. citratus* and *C. martinii* are two economically important essential oil yielding grasses, due to the infection by rust fungus these two species of *Cymbopogons* show serious losses in terms of herb yield, oil content and its quality. Rust fungi are obligate parasites and are highly destructive. Boruah and Bordoloi (1984) reported the pathogen associated with rust disease of *Cymbopogons* as *Puccinia nakanishikii* (Diet). Since, these valuable oil bearing plant species loss their herb yield and oil quality due to rust disease, the study on its control is needed. The present paper, therefore, deals with the chemical control under field condition.

MATERIALS AND METHODS

Field trial with *C. martinii* (Cm) and *C. citratus* (Cc) plants were laid down in randomized block design with 4 replications during 1999-2000 and 2001-2002. The size of each plot was 6.5 x 3.5 meters. The plots were artificially inoculated using leaf rust spore suspension taken from Cm and Cc plants. Simple spray of fungicides viz, Bayleton, Furavax, Bayton, Bayer 5072 70 WP, Plantavax and Vitavax, each taken singly was sprayed at concentration of 0.1% and 0.2% of the products. Suitable controls were also kept where instead of chemicals, only water was sprayed. Final recording of disease intensities were taken after 5 weeks of spraying with a 0 – 4 points rating scale, where 0 = no disease (healthy); 1 = 1 – 25 %, 2 = 26 – 50 %; 3 = 51- 75%; 4 = 76 – 100 % leaf areas infected, using the following formula:

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$$\text{Disease Intensity} = \frac{\text{Sum of all numerical rating} \times 100}{\text{Total number of leaves rated} \times \text{maximum disease grade}}$$

RESULTS

Table 1 indicates that Bayleton at 0.1 percent gave good control of the disease with 3.25 percent of intensity in *C. martini* and 6.25 percent intensity in *C. citratus* followed by Furavax (31.25% and 17.50 % respectively). But the fungicide is more effective when applied at the rate of 0.2 percent. Other fungicides namely, Bayton, Bayer, Plantvax and vitavax are not effective in the control of *Puccinia* rust of the *Cymbopogons*. In control, the disease intensity was found as 85% and 88.75% respectively in *C. martini* and *C. citratus*.

Table 1: Effect of various fungicides on intensity of *Puccinia* rust on Cm and Cc plants

Fungicides Concentration %		Disease intensity (%)	
		Cm	Cc.
Bayer 5072 70 wp	0.2	62.50 (52.28)*	60.00 (51.11)*
	0.1	65.00 (53.78)	81.25 (65.71)
Bayleton 25 wp	0.2	2.00 (7.54)	3.00 (9.33)
	0.1	3.25 (8.91)	6.25 (14.30)
Vitavax 75% wp	0.2	37.50 (37.73)	65.00 (54.75)
	0.1	45.00 (42.10)	80.00 (64.18)
Bayton 15 SD	0.2	27.50 (31.33)	37.50 (37.45)
	0.1	33.75 (35.41)	45.00 (42.12)
Furavax 7.5 % wp	0.2	17.50 (24.44)	10.00 (18.43)
	0.1	31.25 (33.75)	17.50 (24.54)
Control (Untreated)	-	85.00 (67.50)	88.75 (70.91)
CD (0.05)		18.21	11.41

Figures in parenthesis are angular transformed value
Cm = *Cymbopogon martinii*, Cc = *Cymbopogon citratus*

DISCUSSION

Several chemotheraputants, protectants and antibiotics have been tried for the control of wheat rust. Livingston *et al* (1953) recommended that Zineb and Maneb control wheat rust effectively and give more profits. Shrivastava, *et al* (1983) observed that Dithane M – 45 was more effective in reducing the severity of black and brown rust when compared with Dithane Z – 78, Moreston and control. Shrivastava *et al* (1983) studied the efficacy of Triadimefon in the control of leaf rust of wheat. Single foliar spray of Triadimefon (Bayleton 25 WP) along with Furavox 7.5 %, Bayer 5072 70WP and Bayton 15 – SD was compared with the four sprays of Mancozeb against leaf rust of wheat. Bayleton showed high effectiveness in the glasshouse and field conditions when applied at the rate of 0.2 percent. Significant increase in 1000 grain weight was also observed in Bayleton treated plots. Furavax, Bayer 5072 and Bayton were not effective. Brahma and Asir (1988), Brahma *et al* (1989) studied the efficacy of Propiconazole and Dithane M – 45 the control of *Puccinia graminis* tritici, *P. recondita*, *P. striiformis* in wheat and found that

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Propiconazole at 0.125 % gave the best result. In 1991 Brahma *et al* performed experiments on efficacy of Tilt (Propiconazole) on different wheat cultivars. Propiconazole (0.1%) was applied to seedlings at the first appearance of rust. The fungicide was effective against all rusts but there were significant differences amongst the cultivars in relation to the increase of 100 grain wt. Foliar spraying is a popular test method for evaluating fungicides against cereal rusts in seedling tests (Livingston, 1953; Keil *et al* 1958; Davis *et al* 1960). The drop test is another foliar method for evaluating the effectiveness of systemic fungicides against cereal rusts (Rowell, 1972, 1976). In this method a 10 µl drops of the test compound in a solution of Tarun 20 at 500 µg /ml is placed on the abaxial surface at a distance of 5 cm from the tip of fully elongated first foliar leaves of seedlings. Result of our present investigation is in conformity with earlier findings of Siebert (1976) who has also reported Bayleton as highly effective against cereal rust of wheat.

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