

Screening of selected rice varieties for *Meloidogyne graminicola* infestation and potential of *Trichoderma viride* to control its infestation

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Meloidogyne graminicola is an obligatory endo-parasitic nematode species which becomes a threat to paddy cultivation in several regions in Sri Lanka. Other than using the highly toxic nematicides, it is necessary to find out effective eco-friendly methods to control *M. graminicola*. In this context, identification of resistant rice varieties which are able to tolerate the infestation of this nematode and use of bio control agents such as *Trichoderma viride* are important. The present study was conducted to assess the resistance levels of selected new rice varieties to *M. graminicola* infestation and also to find out the effectiveness of *T. viride* against its infestation.

The rice varieties namely Bg 407, Bg 366, Bg 403, Bg 251, Bg 369, Bg 380, Bg 310, Bg 745 were tested by inoculating the second stage juveniles (J_2) of *M. graminicola* at a rate of five juveniles per plant. Inoculation was done at tillering stage of the rice plants which had been transplanted in pots containing 200mg amount of soil per each. The tillers in each variety were arranged in a completely randomized design with ten replicates. The effectiveness of *T. viride* against *M. graminicola* infection was determined. Five similar portions of *T. viride*, 1×10^4 spores/ml, 10ml were sprayed around the randomly selected, nematode inoculated five tillers which were transplanted in the pots. "Above" and "below" ground plant measurements, final nematode population and gall index/GI (Number of galls per tiller) of plants was obtained as post treatment assessment. The criterion used in determination of resistant levels is the gall index.

Bg 366 (GI: 39) and Bg 251 (GI: 36) could be categorized as susceptible varieties based on the number of galls per tiller. The reproduction factor of rice root knot nematode was also considered in this categorization and was higher in these two varieties compared to the other tested varieties. Bg 407 (GI: 28), Bg 369 (GI: 29), Bg 380 (GI: 27), Bg 310 (GI: 24), Bg 745 (GI: 26) rice varieties were grouped as moderately susceptible rice varieties. These varieties acquired more or less similar reproduction factors, but less than that in susceptible varieties. Bg 403 which possessed the lowest reproduction factor was categorized as the moderately resistant variety. There was a significant reduction in the mean number of galls ($p = 0.000$, $F = 68.92$) and the weight of the fresh root of *T. viride* treated tillers ($p = 0.001$, $F = 12.89$), compared to the untreated tillers.

The present study also revealed that the Bg 403 rice variety which was capable of enduring the damage could be recommended for paddy cultivation. The other tested susceptible and moderately susceptible rice varieties can be recommended for paddies together with the application of biocontrol agent such as *T. viride*.

Keywords: Bio control agent, Gall index, *Meloidogyne graminicola*, Resistant rice varieties, *Trichoderma viride*