MANAGEMENT OF FOOT AND ROOT ROT OF BETEL VINE CAUSED BY *Sclerotium rolfsii*

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Extended Summary

Betel vine (*Piper betle* L.) is an important cash crop in Bangladesh. Foot and root rot disease caused by *Sclerotium rolfsii* is a limiting factor of betel vine production in Bangladesh. The fungus reduces the yield and quality of leaves. The research program were undertaken to study the efficacy of some selected fungicides, plant extracts and bio-agents against foot and root rot disease of betel vine in the field.

The present experiment was carried out in the Plant Pathology Laboratory, Department of Plant Pathology, Sher-e-Bangla Agricultural University and at the nursery house under natural condition during June 2015 to July 2016. The field experiment was laid out in a Randomized Complete Block Design (RCBD) with three replications of each treatment. The *in vitro* effect of the fungicides, plant extracts and bio-agents were compiled based on inhibition of mycelium growth and number of sclerotia of *Sclerotium rolfsii* and *in vivo* effect of the treatments were compiled based on disease incidence and disease severity.

In *in vitro* assay, Bavistin 50 WP performed the best result in inhibition of mycelial growth of *Sclerotium rolfsii* followed by Topgan. Among six plant extracts, Garlic clove extracts showed better performance than other plant extracts in inhibition of mycelial growth of *Sclerotium rolfsii*. Between the two bio-agents *Trichoderma harzianum* showed better performance than *Pseudomonus fluorescens* in inhibition of mycelial growth of *Sclerotium rolfsii*. The highest number of sclerotia (529.0) was produced in untreated control condition and the lowest number of sclerotia (114.7) was produced in Bavistin 50 WP in laboratory. The maximum percent reduction of number of sclerotia was recorded in case of Bavistin (78.32%).

In case of nursery experiment, the disease incidence were observed at different DAT. The minimum plant infectoin was observed in case of Bavistin treated plot. The lowest percent disease incidence (0.71%) was recorded in case of Bavistin at 120 DAT. The highest percent disease incidence (8.16%) was recorded in case of untreated control condition while garlic clove extract and *Trichoderma harzianum* treated plot showed (4.88%) and (5.67%) disease incidence respectively at 120 DAT. The plant infection gradually increased with the increase of the age of the

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plant and increasing rate was sharp in control plot but very slower in treated plot. The maximum percent reduction of disease incidence were recorded in Bavistin treated plot (91.30%). In terms of yield, the highest yield (2.13 ton/ha) were achieved by applying Bavistin and the second highest performances were achieved by Tilt 250 EC and the lowest yield (1.32 ton/ha) were achieved by untreated control condition while (1.68 ton / ha) were achieved by *Trichoderma harzianum.*

From the findings of the present investigation, it may be concluded that Bavistin had a promising effect in reducing the disease incidence and severity of foot and root rot of betel vine and also increasing the yield. Topgan also showed the second highest performance in suppressing the disease and increasing yield. Garlic clove extract and *Trichoderma harzianum* showed significantly better performances. Thus, the farmers may be suggested to use Bavistin for the control of foot and root rot of betel vine.