

Siriporn Amthong 2014: Efficacy of Potassium Silicate and *Trichoderma harzianum* for Reducing Leaf Brown Spot, Dirty Panicle and Increasing Yield of Rice. Master of Science (Plant Health), Major Field: Plant Health, Department of Plant Pathology. Thesis Advisor: Associate Professor Chiradej Chamswarnng, Ph.D. 116 pages.

Leaf brown spot of rice caused by *Helminthosporium oryzae* is an important fungal disease in rice production. This research was conducted to study the efficacy of silicon in the form of liquid potassium silicate and two fungal strains of *Trichoderma harzianum* CB-Pin-01 and 01-52 for reducing leaf brown spot, dirty panicle and increasing yield of rice in open-field house and paddy field. Results showed that the use of 3,000 ppm potassium silicate in the open-field house effectively promoted growth of rice by increasing the height of seedlings at tillering, panicle forming and flowering stages 7.10, 8.62 and 5.60 %, respectively and increasing the length of roots in all stages of growth. In addition, number of plant per hill and per panicle were increased by 30.95 and 6.55 %, while incidences of leaf brown spot were reduced at tillering stage, panicle forming stage and flowering stage by 22.01, 29.16 and 32.32 %, respectively. At harvesting, the dirty panicle was reduced by 21.45 % whereas, the yields per hill and per panicle were increased by 53.80 and 66.04 %. The use of *T. harzianum* CB-Pin-01 in combination with 2,000 ppm potassium silicate increased the height of seedlings at tillering, panicle forming, and flowering stages by 18.16, 9.13 and 5.76 %, respectively. The incidences of leaf brown spot at tillering, panicle forming, and flowering stages were reduced by 24.62, 33.33 and 33.89 %, respectively. The dirty panicle incidence was reduced by 21.45 %, whilst the yields per hill and per panicle were increased by 47.35 and 45.79 %, respectively. The efficacy of *T. harzianum* 01-52 was comparable to the use of *T. harzianum* CB-Pin-01 on promoting growth of rice, reducing leaf brown spot, dirty panicle and increasing yields of rice.

Under field condition, the use of *T. harzianum* CB-Pin-01 in combination with 2,000 ppm potassium silicate effectively promoted the growth of rice by increasing the heights of rice plants at tillering, panicle forming and flowering stages by 16.11, 15.28 and 21.76 %, respectively, In addition plants per hill, panicles per hill, and yield were increased by 40, 75 and 24.84 %, respectively. The incidences of leaf brown spot at tillering, panicle forming and flowering stages were reduced by 36.36, 40.00 and 42.5 %, respectively. While the dirty panicle was reduced by 10 %.

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Thesis Advisor's signature