EFFECTS OF SILICON SUPPLEMENTS ON CONTROL OF RICE GRAIN DISCOLORATION DISEASE

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ABSTRACT

Rice is the most important cereal crop in Sri Lanka. Grain discoloration is an emerging disease complex, reducing grain quality of rice crop. Grain discoloration control is, however, mainly focused on fungicide; their use is limited due to perceived environmental problem and health concern. Silicon application is known as encouraging eco friendly alternative to fungicide. Foliar application of silicon (Si) based formulations were evaluated to examine their effect on reducing grain discoloration disease and determine the best Silicon supplement among the three Si-based products tested. Identification of pathogen causing grain discoloration was also carried out in this study.

Field trials were conducted at Rice Research and Development Institute (RRDI), Bathalagoda from May to September 2017. After planting, Si was applied as solution at the rate of 1 ml/L at tillering and early flowering stage. Fungicide and control (distilled water) were applied as treatments at early flowering stage. Treatments were arranged in a randomized complete block design with three replications. Incidence of plant infection, percentage of grain discoloration and empty seed percentage of rice were calculated at harvesting stage.

Laboratory study was carried out to isolate the grain discoloration causing pathogen from the infected seeds by using Potato Dextrose Agar plate method at Pathology division, RRDI, Bathalagoda. Pure cultures of pathogens were obtained through sub culturing. They were identified according to macroscopic features of pure culture and spore morphology.

Analysis of variance was performed for all parametric variables and Probit analysis was done for non-parametric variables using SAS 9.1 package.

Incidence of plant infection and grain discoloration percentage were reduced by foliar application of silicon supplements as same as fungicide application. Among the Si-based formulations tested, Gainexa UPL gave the best result in controlling grain discoloration in rice. These silicon supplements could be used as alternatives to synthetic fungicide and could reduce the amount of fungicide needed during rice crop cultivation.

Curvularia spp. was isolated from the infected rice seeds. *Curvularia lunata* and *Curvularia pallescence* were identified as probable causal organisms of grain discoloration disease in rice from the study.

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