

## **Study on the Control of Non-Pesticide Materials on Bakanae Disease of Rice Seedlings<sup>1</sup>**

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### **Summary**

Many varieties of rice seeds were contaminated with *Fusarium* sp. to cause bakanae disease on rice seedlings in Hualien area. This contamination can decrease by surface sterilization. *Fusarium* isolation ratio was high and commonly found on the KS 139 variety. The nursing soil was also found containing *Fusarium* sp.. For applying to organic farming of rice, experiments for effects of non-pesticide materials on bakanae disease of rice seedlings were conducted at Jian, Hualien. Materials including clove oil, cinnamon oil, neem oil, azadirachtin, phosphorous acid, antagonistic bacteria and chitosan were tested. The rice seeds were treated with plant oils before germination, the result showed that the most effective two materials on *Fusarium* sp. were clove oil and cinnamon oil. The seed germinated as well as the untreated. But, the rice seed treated with plant oil after pregermination, plant oil treatment of seed germination was inhibited by clove oil 1667ppm and cinnamon oil 1000ppm. Controlling bakanae disease by plant oil on nursing box, cinnamon oil 667ppm was the most effective, then followed by clove oil 833ppm. Cinnamon oil carried by talcum powder was used to cover rice seeds had the same effect as that of cinnamon oil. From those results, it was confirmed that plant oil could be used to treat rice seeds on the organic culture. It also indicated that other plant oils, azadirachtin, antagonistic bacteria and chitosan also showed some effect on the control of bakanae disease on rice seedling. Integrated results showed phosphorous acid solution 667ppm had stable effect on bakanae disease of rice seedlings. Pathogen of bakanae disease can survive in rice husk about 6 months. The nursing soil amended with castor cake or oyster shell powder can suppress the incidence of bakanae disease, its controlling efficacy is 50% and 43%, respectively; when the two amendments mixed together with nursing soil had the highest controlling efficacy 80%. Besides, the optimal amending ratio of castor cake was tested to be 0.6% (w/w).

Key words: rice, bakanae disease, *Fusarium moniliforme*, plant essential oil, oyster shell powder, castor cake, organic farming

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