

Suchada Boonlertnirun 2006: Effects of Chitosan on Agronomic Characters and Some Physiological Responses of Rice (*Oryza sativa L.*) Cultivar Suphanburi 1 under Drought Condition. Doctor of Philosophy (Tropical Agriculture), Major Field: Tropical Agriculture, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Isara Sooksathan, Ph.D. 89 pages.

ISBN 974-16-2974-5

Chitosan is a natural biopolymer extracted from chitin by deacetylation process. Chitosan not only stimulates growth and increases yield but also regulates the immune system of plants under unfavorable conditions. The objectives of this study were to determine the effective type of chitosan and the appropriate application for rice yield increasing under drought condition. A series of experiments were carried out in order to obtain basic information about chitosan application in rice plants. This study was conducted in a greenhouse and laboratory at Rajamangala University of Technology Suvarnbhumi, Huntra Cmpus, during November 2003 to Febuary 2006. The results found that the application of polymeric chitosan by seed soaking before planting followed by four foliar sprayings showed the best effect on growth and rice yield. The optimum chitosan concentration for applying in rice plants was 20 ppm, and four foliar sprayings throughout cropping season was the best effectiveness. Under drought condition, it indicated that rice plants applied with chitosan before drought occurrence showed good recovery and maintained growth and yield over those of control. Some physiological responses of rice plants under drought after chitosan application showed that the proline and soluble sugar accumulation in treatment applied with chitosan and fertilizer rapidly increased over the control whereas the activity of nitrate reductase tended to be higher than the others but did not showe any significant differences. The total nitrogen content in treatment applied with chitosan and fertilizer was significantly increased over the control. In this study, it may be concluded that application of polymeric chitosan at the rate of 20 ppm sprayed before drought might reduce the severe damage of rice plants and maintaining growth and yield.

Suchada Boonlertnirun  
Student's signature

Isara Sooksathan  
Thesis Advisor's signature

30, Oct, 2006