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Research Paper

ADVANCE RESEARCH JOURNAL OF
C R P
IMPROVEMENT
Volume 3 | Issue 2 | December, 2012 | 73-78

Response of paddy (*Oryza sativa* L.) cultivars to bio-inoculants to early seedling growth

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ABSTRACT : The present study was carried out to evaluate the response of different bio-agents/ bio-inoculants/ bio-fungicides and growth regulators on seed germination and early seedling growth of rice genotypes. Giberallic acid(GA_3) and NAA were used as growth regulator and *Trichoderma viride*, *Pseudomonas fluorescens* and *Trichoderma harzianum* like bio-pesticides or bio -fungicides were used as bio-agents. Fifteen numbers of rice genotypes were used for studying the influence of bio-inoculants on seed germination and early seedling growth of rice. Fifteen different treatment combinations were used for investigation. Higher germination was observed in T_3, T_7 treatments in contrast to other treatments like chemicals as well as control. Generally root and shoot length increased with the advancement of growth stages. T_4 (*Pseudomonas fluorescens*) treated seeds showed higher number of secondary root (8.5 -15.8) in comparison to all other treatments in respect of all the genotypes. The shoot length, root length and seedling weight in all the rice genotypes cases were highly influenced by the bio-inoculants and chemicals but influence of bio-agents was found better than the chemicals. Similarly the seedling weight in both 96 hours after sowing and 144 hours after sowing in all the rice genotypes were reported higher when the seeds were treated with bio-inoculants which reflected the efficacy of the bio-inoculants like *Trichoderma viride*, *Pseudomonas fluorescens* and *Trichoderma harzianum* proved to be better than the rest.

Key Words : Rice genotypes, Bio-inoculants, Early seedling vigour

How to cite this paper : Lakshman, Shyam Sundar and Mukherjee, B. (2012). Response of paddy (*Oryza sativa* L.) cultivars to bio-inoculants to early seedling growth, *Adv. Res. J. Crop Improv.*, **3** (2) : 73-78.

Paper History : Received : 17.05.2012; **Revised :** 01.08.2012; **Accepted :** 01.10.2012

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Rice (*Oryza sativa* L.) is the staple food for half of the world's population especially in oriental countries. In India, about 2500 varieties of rice are being cultivated, from which more than 1200 varieties are in eastern India which are preferred over others, owing to their high yield, good quality and quantity of grain, short duration of growth and resistance against pest and diseases. A large number of experiments have been conducted in several countries to investigate the effect of inoculation of various strains of *Azospirillum* spp. on cereals and grasses (Smith *et al*., 1976; Watanabe *et al.*, 1981). The aim of the application of *Azospirillum* is to get fast growth, better health of the plant and higher yield. It is known to be a very active nitrogen fixer under laboratory as well as soil conditions. Various kinds of cereals were tested by using a member of nitrogen fixing bacteria *viz.*, *Azotobacter, Nitrosomonas* and *Azospirillum* to increase yield under controlled conditions. Balasubramanian and Kuamr, 1987; Wani, 1990; Bashan and Holgain, 1995 investigated that *Azospirillum* treatment showed remarkable increase in the grain and the straw yield in sorghum, wheat, maize, paddy and other food and fodder crops. The yield responses caused by *Azospirillum* inoculation may be due to biological nitrogen fixation (Hartmann *et al*., 1983). Split application of biofertilizer inoculation through seed, seeding and soil gave the highest grain, straw yield, plant height and number of productive tillers in rice (Gopalswamy and Vidhy asekaran, 1988). The objective of the present study was to investigate the effect of *Azospirillum* inoculation on the different paddy varieties to find out the best variety. The observations were made to note the seedling characters such as seed germination, biomass and phytomass yield of paddy varieties under controlled conditions.

RESEARCH PROCEDURE

The seeds were sterilized with 2 per cent mercuric chloride solution before treatment. After sterilization, the seeds were washed well with sterile distilled water. Twenty five seeds were