

Effect of Elevated Carbon Dioxide with Varying Nutrient Management on Rice Production System in Eastern India

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Rice, being a major food for more than half of the world population, its production management needs attention to mitigate the adverse effect of climate change and to ensure global food security. Field experiment was conducted in Open Top Chambers (OTCs) to understand the effect of elevated CO₂ with varying nutrient management on rice production system. The experiment was conducted during wet season (June-November) of the year 2011-12 in the research farm of Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur. Rice cultivar 'Swarna sub-1' was grown inside OTCs in ambient CO₂ and elevated CO₂ (25% higher than ambient) and in open field condition with five different nutrient management treatments. Results from the field experiment indicated an increasing vegetative biomass, but a decreasing grain yield of 3.4% under elevated CO₂ as compared to ambient environment. Among the nutrient management, higher level of nutrient (chemical fertilizer applied at 125% of recommendation) had significantly higher grain yield as compared to integrated nutrient management of 100% N recommendation through chemical fertilizer (CF) and organic fertilizer (OF), and CF alone. However, elevated CO₂ level resulted a decline in grain yield with CF alone but increase in yield with integrated nutrient management. Increased CO₂ level resulted a decrease in soil available nitrogen content. The bacterial count was higher under elevated CO₂ as compared to ambient environment increasing soil organic carbon content.

Biography

Sushree Sagarika satapathy is doing PhD in Indian Institute of Technology Kharagpur, Kharagpur, India. She is doing research on "Climate change impact assessment on rice-rice crop system". Her area of interest is climate change, adaption, crop modeling.

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