ABSTRACT

Agriculture is the main occupation in India. Pesticides are the key inputs in agricultural production which control major diseases of crop plants. The use of pesticide is not without controversy due to the destructive effects they cause in crop plants and pollute the soil and water reservoir.

In the present study, an attempt has been made to evaluate the effects of BAAN (systemic fungicide) on eight cultivars of rice (Thanu, B.R.2655, MTU1001, MTU1010, KRH-2, KMR-3R, IET7575, IR30864) with following objectives, (i) effect on morphological parameters (fresh and dry weight, shoot and root length, vigour index, % phytotoxicity, tolerance index), (ii) effect on biochemical parameters (total protein content, chlorophyll a, chlorophyll b and total chlorophyll content, assay of α- amylase and catalase activity), (iii) effect on physiological parameters (nutrient uptake (macro and micro), net photosynthetic rate, stomatal conductance, intercellular carbon dioxide concentration and carbon isotope discrimination among eight cultivars of rice). Three concentrations of fungicide were used during the study Viz., lower than recommended dosage (0.1%), recommended dosage (0.2%) and higher than recommended dosage (0.3%).

Results of this work showed that application of BAAN is not beneficial to cultivars like Thanu and B.R.2655 as the fungicide induces a reduction in morphological, biochemical and physiological parameters studied.
Cultivars like KMR-3R and MTU1010 have responded positively to the fungicide application but higher dosage has found to be phytotoxic to these cultivars. Hence indiscriminate use of fungicide should be avoided.

Even recommended dosage of fungicide has shown weak phytotoxicity in cultivars like KRH-2, MTU1010, IR30864 and IET7575. The results obtained partially support the use of this fungicide in these cultivars as it has shown slight phytotoxicity.

The fungicide may control disease causing fungal pathogens thus protecting the plants against diseases but the present work indicates many deleterious effects on morphological, biochemical and physiological parameters in some cultivars of paddy. Hence judicious use of the fungicide in the vulnerable cultivars or substituting chemical pesticides with organic pesticides is an alternative solution.