

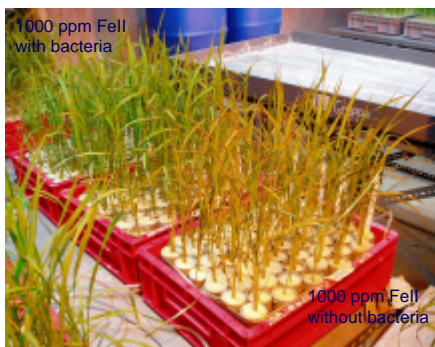
## Introduction

The beneficial effects of root-associated bacteria in biologically controlling soil borne pathogens have been well established. Conversely, little is known about how these beneficial micro organisms affect responses of plants to abiotic stresses. An investigation was thus undertaken to evaluate whether root-associated bacteria endemic to rice could be used to mitigate the effects of iron toxicity symptoms in lowland rice. *Bacillus* sp. Has been shown to positively affect symptom expression of lowland rice under iron toxicity. Here we study the effect of three bacteria strains on the uptake and distribution of Fe in six lowland rice cultivars.

## Conclusions

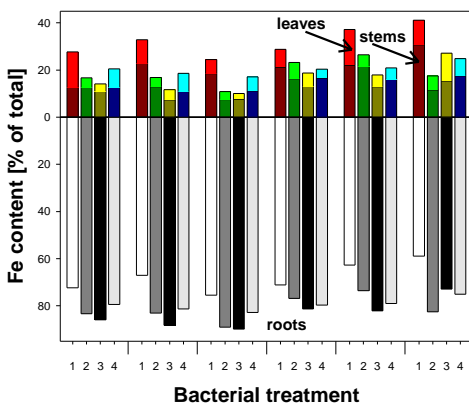
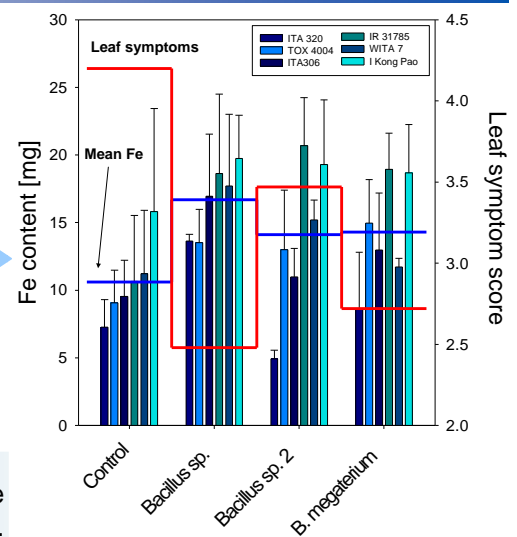
- /// Inoculation with bacteria strains from rice roots helped mitigating Fe-toxicity symptoms in lowland rice.
- /// *B. megaterium* reduced Fe concentration in leaves.
- /// Inoculation increased the amount of Fe sequestered to the roots
- /// Bacterial effects on distribution of Fe in the plant decreased leaf symptom scores

## Results - Summary



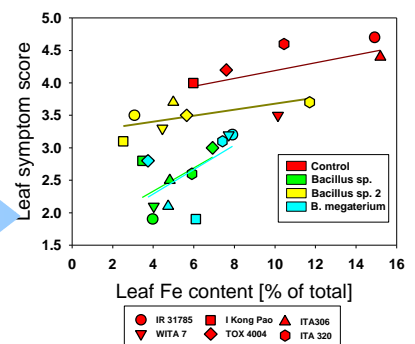
All of the inoculates significantly reduced iron toxicity symptoms

Some bacteria x genotype combinations resulted in higher total Fe uptake. All bacteria reduced leaf symptoms

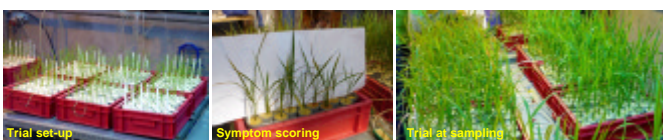


Bacteria increased the share of Fe sequestered in the roots. Leaf Fe content decreased in all cases.

*B. megaterium* strongly reduced leaf Fe uptake. All genotypes responded positively to bacteria treatment



## Notes on Materials and Methods



- /// We isolated several strains of *Bacillus* from surface sterilized seeds of lowland rice and maintained them at -18 °C.
- /// Six lowland rice genotypes contrasting in Fe toxicity tolerance were included.
- /// Plantlets were grown in a hydroponics system with Yoshida solution for 2 weeks, 1000 ppm Fe was added for 7 days after one week of bacteria inoculation.
- /// Three bacteria, *B. megaterium* and two isolates of *Bacillus* sp. were used to inoculate root systems of 3-week-old seedlings.
- /// Five days after initiation of the treatments genotypes were visually scored for bronzing symptoms and destructively sampled for tissue iron analyses.
- /// Finely ground samples were analysed for Fe content using high pressure acid digestion and AAS.