

Trichoderma conferred induced resistance in soybean

The overall goal of this research project is to increase profitability of soybean production by simultaneously enhancing yield as well as tolerance against biotic and abiotic stresses. We are characterizing strains of the naturally occurring, nonpathogenic soil fungi *Trichoderma koningiopsis* (T-51) for plant growth promotion and tolerance to stresses. The proposed work is aimed to characterize the efficacy of T51 in protecting soybean plants against microbial diseases and abiotic stresses and to characterize the effect of T51 on soybean plant vigor, yield and protein content. The molecular events resulting in the establishment of induced resistance and yield in soybean plants will also be characterized. Following three aims are being pursued.

Specific Aims

1. Evaluate growth and stress response in soybean treated with T-51
2. Test effect of T-51 on soybean growth promotion, resistance to other pathogens and induction of SAR
3. Test functionality of known signaling components in T-51 conferred induced resistance

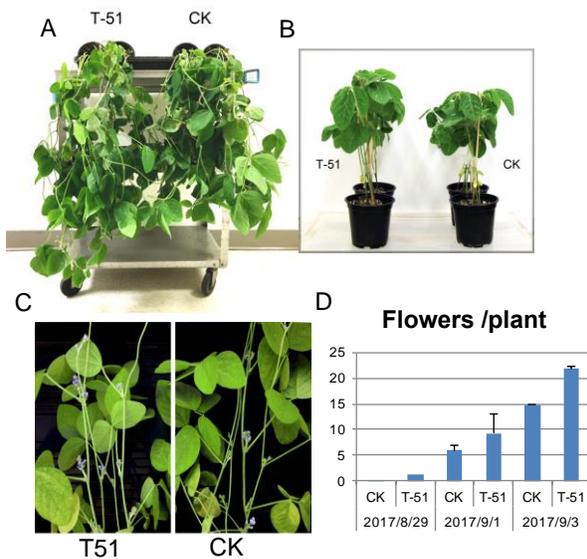


Figure 1. T51 confers plant growth promotion in soybean. (A and B) T51 plants show taller phenotype, and increased leaf size. (C and D) T51 promotes early flowering in soybean. We are currently observing seed set in T51 inoculated plants and will also be assaying seeds for protein and oil content.

Results

- T51 inoculated plants showed improved growth and early flowering (Figure 1).
- T51 treatment of soybean conferred enhanced tolerance to biotic and abiotic stresses
- T51 treated plants showed increased nodulation
- T51 inoculation confers induced systemic resistance
- T51 inoculation was not able to confer ISR on soybean plants silenced for salicylic acid (SA) biosynthesis. This suggests that SA is required for T51-mediated systemic resistance.
- T51 inoculation was associated with a nominal induction in pipecolic acid levels, but not SA or azelaic acid.