Objective

The project aims to characterise how management practices shape the microbiome and affect the susceptibility of bananas to Fusarium wilt, by increasing the understanding of host-pathogen-microbiome interactions.

The objectives are to:

- Determine the microbiome differences that exist in current banana production systems.
- Develop farm management options for banana growers to reduce Fusarium wilt.
- Understand grower networks and the factors that guide decision making processes, and provide decision support tools to manage Fusarium wilt of bananas.

Expected scientific results

- Increased skills in soil ecology and microbiome analysis for scientists in banana production systems with “in-country” procedures for measuring the banana microbiome.
- Increased knowledge for banana grower’s on how farm practices and land use alter the banana microbiome, from “wild bananas” to export production in Southeast Asia.
- Increased knowledge for banana growers of how farm management practices alter the microbiome and can suppress development of Fusarium wilt.
- Increased soil health testing skills for researchers and extension personnel using ‘in-country’ tests to account for physical, chemical and biological soil properties, and increased farm advisor knowledge on disease risk with changing farm practices.
- Development of portable, in-field instruments for microbiome analysis.
- Increased knowledge on the role played by the microbiome in protecting banana plants from Fusarium wilt.
- Potential benefits for banana industries globally.

Expected impact/outcomes

- Increased capacity to undertake research to determine how microbiomes change under different scenarios of farm management or cropping systems.
- Grower knowledge that farm management practices such as excessive tillage, agro-chemicals and fertiliser applications in long-standing monocultures, while highly productive, create more vulnerability to soil borne diseases than smallholder systems with diverse cropping and inputs.
- Suppression of Fusarium wilt and ongoing banana production in Southeast Asia through the adoption of farm management practices.
- Increased ability of farm advisors to offer soil health risk assessments to facilitate practice change and improve disease suppression.
- Increased researcher and extension staff knowledge about who influences banana grower’s decision making in banana producing countries in Southeast Asia and Australia, allowing targeted campaigns to change management systems.
- Increased confidence for growers to produce bananas in the presence of Fusarium wilt with targeted farm management practices to optimise productivity and disease suppression.

Australian Aid

ACIAR
aciar.gov.au