



Australian Government

Cotton Research and  
Development Corporation

# TRAVEL, CONFERENCE or SCIENTIFIC EXCHANGE REPORT 2015

## *Part 1 - Summary Details*

---

Please use your TAB key to complete Parts 1 & 2.

CRDC Project Number: UWS1501

---

**Project Title: Harnessing rhizosphere-soil-microbial interactions for increasing farm productivity and resilience of farming systems**

---

Project Commencement Date: 1/06/15      Project Completion Date: 24/11/15

CRDC Research Program: 2 Industry

## *Part 2 – Contact Details*

---

**Administrator:** Rochelle Finlay  
**Organisation:** Western Sydney University  
**Postal Address:** PO Box 1797, Penrith NSW  
**Ph:** (02) 9678 7125 **Fax:** N/A **E-mail:** [r.finlay@westernsydney.edu.au](mailto:r.finlay@westernsydney.edu.au)

**Principal Researcher:** Professor Brajesh Singh  
**Organisation:** Western Sydney University  
**Postal Address:** PO Box 1797, Penrith NSW  
**Ph:** (02) 4570 1329 **Fax:** N/A **E-mail:** [b.singh@westernsydney.edu.au](mailto:b.singh@westernsydney.edu.au)

---

**Supervisor:** Professor Brajesh Singh  
**Organisation:** As above  
**Postal Address:** As above  
**Ph:** (02) 4570 1329 **Fax:** N/A **E-mail:** [b.singh@westernsydney.edu.au](mailto:b.singh@westernsydney.edu.au)

---

**Signature of Research Provider Representative:** \_\_\_\_\_

**Date Submitted:** \_\_\_\_\_

## ***Part 3 – Travel, Conference or Scientific Exchange Report***

---

*(Maximum two pages)*

### **1. A brief description of the purpose of the workshop.**

The purpose of the funding was to co-fund a workshop entitled: Harnessing rhizosphere-soil-microbial interactions for increasing farm productivity and resilience of farming systems.

Soil health in combination with the use of efficient crop varieties that can harness rhizosphere and microbial interactions can increase farm productivity by up to 50%. Such an increase is essential to supply the increasing demand for food and fibre in the coming decades and to maintain profitability for farming businesses.

### **2. What were the:**

#### **a) major findings and outcomes**

The outcomes of the workshop were:

1. Knowledge which is currently available and can be harnessed for increasing farm productivity and resilience of farming systems identified.
2. Techniques to manipulate soil-root-microbe interactions for better plant, water and nutrient use efficiency determined.
3. Knowledge gaps and key components that can be addressed in the short-term to harness rhizosphere-microbial interactions for profitable farming identified.
4. A global consortium to address these important issues to increase farm productivity and food security discussed.

International experts who attended this workshop were given an overview of the latest research in the rhizosphere field. Presentations were given by:

- Prof. Richard Bardgett (UK): Rhizosphere interactions, plant productivity and soil carbon
- Dr Yong-Guan Zhu (China): Rhizosphere microbiology interaction research in China and how it is intended to be used to enhance food production
- Prof Peter Bakker (Netherlands): Exploiting the rhizosphere microbiome for disease control
- Prof Karl Ritz (UK): Rhizosphere interactions and soil structural health
- Prof David Eissenstat (USA): Linking root traits with root function

After these presentations, breakout groups helped to identify the key issues and challenges the agricultural industry is facing. These issues included:

- Nutrient use efficiency
- Disease
- Resilience
- Environmental outcomes
- Advancement (overarching across all above points)

Workshop participants addressed the issues raised, discussed how each issue could be resolved and then formulated a plan which would be used as the basis for a white paper and a synthesis paper.

#### **b) other highlights**

Not applicable.

**3. Detail the persons and institutions visited, giving full title, position details, location, duration of visit and purpose of visit to these people/places. (NB:- Please provide full names of institutions, not just acronyms.)**

The workshop was held at The Grace Hotel, York St Sydney on Saturday 10<sup>th</sup> October and Sunday 11<sup>th</sup> October 2015. A list of participants is provided here:

Prof Peter Bakker - Assoc Prof in Biology, Utrecht University, Netherlands
Prof Karl Ritz - Professor of Soil Biology, Faculty of Science, Nottingham University, UK
Prof David Eissenstat - Professor of Woody Plant Physiology, Pennsylvania State University, USA
Prof Richard Bardgett - Professor of Ecology, University of Manchester, UK
Dr. Yong-Guan Zhu - Director General of Institute of Urban Environment, Chinese Academy of Sciences, China
Dr. Pauline Mele - Microbial ecologist with the Department of Environment and Primary Industries, Australia
Prof Daniel Murphy - Chair in Soil Biology, School of Earth and Environment, University of Western Australia
Prof Braj Singh - Director, Global Centre for Land-Based Innovation, Western Sydney University
Dr. Jonathan Plett – Research Fellow, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Jeff Powell – Senior Lecturer – Hawkesbury Institute for the Environment, Western Sydney University
Prof Elise Pendall - Theme Leader for the Soil Biology & Genomics research theme - Hawkesbury Institute for the Environment, Western Sydney University
Dr. Yui Osanai – Research Fellow, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Pankaj Trivedi - Research Fellow, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Kelly Hamonts - Research Fellow, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Yolima Carrillo Espanol – Lecturer, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Manuel Delgado Baquerizo - Research Fellow, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Barbara Drigo - Research Fellow, Hawkesbury Institute for the Environment, Western Sydney University
Dr. Hang-Wei Hu – Research Fellow, Agriculture and Food Systems, Melbourne University

**4. a) Are there any potential areas worth following up as a result of the workshop?**

Brief discussion held to identify mechanisms to form a global consortium. Further discussion will take place to crystallise this issue.

**b) Any relevance or possible impact on the Australian Cotton Industry?**

This is a golden opportunity for the cotton industry to implement targeted research on rhizosphere-microbial interactions to sustainably increase farm productivity and profitability.

**5. How do you intend to share the knowledge you have gained with other people in the cotton industry?**

Communication of outcomes:

- a. White paper for Industry and relevant organisations, e.g. CRDC (via direct report), other related organisations (e.g. Department of Agriculture), Australian Research Council. *Discussion outcomes for the white paper are now in the drafting process with an expected completion date by the end of 2015.*
- b. General public via web page and social media updates: *Global Centre for Land-based Innovation's website and social media links have been updated with details of the workshop and photos during the workshop. These will continue to be updated as the white paper and synthesis paper are produced.*
- c. Scientific community via a synthesis paper.

**6. Please list expenditure incurred. (Double click inside the table to enter the data)**

---

Please email your report 30 days after travel/conference to: [research@crdc.com.au](mailto:research@crdc.com.au)