WESTERN SYDNEY UNIVERSITY

Global Centre for Land-Based Innovation

SOIL SCIENCE AUSTRALIA

# Soil Biology and Health Certificate Program in Partnership with Soil Science Australia

In this program, participants will learn about the properties of soils and learn how to adopt practices and strategies to enhance soil health and biological activities and use the power of plant-soil-microbial relationships to unlock soil nutrients, produce healthier and more nutritious plants and understand how microbes in soils influence soil fertility and drive plant production.

This program will have two parts:

1. The first two days is an introductory course related to increased productivity through environmental and sustainable management practices. No prior knowledge is needed.

2. In combination with Part 1, the last two days are designed for consultant, farmers and others who have interest in integrating soil biology/ health in agronomic practices.

- Attendance of all 4 days is necessary for receiving a certificate from **Soil Science Australia**.
- Attendance at this course by accredited CPSS can be claimed in their OPD.
- **The certificate will be awarded on the behalf of Soil Science Australia.**

**Date: 15- 18 August, 2023**

**Program fee: $1995.00**


## Harnessing the Life in Soils:

The Certificate Program includes:

- Full overview of soil health, soil biology and nutrition practices that reflect the latest, emerging research findings
- Conference dinner with delegates
- Conference materials and access to soil health facilities at Western Sydney University's Hawkesbury campus
- Morning teas, lunches, and afternoon tea on day one.

## Course outline:

The course program will expand your understanding of how new research is driving renewed interest in soil health and soil biology as a function of overall farm productivity:

The program includes:

- History of soil biology and agriculture
- Diversity and functions of soil microbes that drive productivity
- Nutrient cycling of nitrogen, carbon, and other nutrients
- Plant and microbial interactions
- Soil fauna that influences soil biology and activity
- Integrating soil health methods into practice

## Who Should Attend This Course?

An ideal program for keen and innovative delegates seeking to understand the benefits of soil biology as a driver of healthy crops and healthy foods in sustainable production environments:

- Proactive and innovative growers across horticultural and agricultural sectors
- Consultants, advisors, and agronomists seeking to unlock new value from cropping operations

## Availability

On Campus: Hawkesbury Campus, Western Sydney University

## Program Evaluation and certification:

The certification program will consist of evaluation of knowledge acquired during the course. It will include a quiz and a short essay response.

Option 1: Quiz with 20 question multiple choice that test participants knowledge on concepts of soil health, soil biology as management practices that harness soil biology. Plus two short answer questions that present a scenario that describes productivity issues on farm and asked how these could be overcome by integrating methods/tools/approaches that harness soil biology.

## Learning Outcomes:

Upon successful completion of this subject, participants should be able to:

- demonstrate a broad understanding of the concepts of soil health
- understand the principals of the role soil biology plays in productivity
- identify management practices that can promote soil biology
- demonstrate the practical knowledge to be able to harness soil biology and integrate into practice

# Soil Biology and Health Certificate Program

## Day 1

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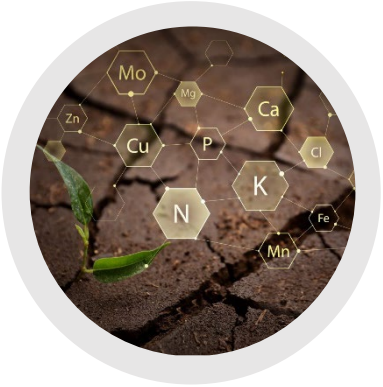
| Introduction to soil biology | An overview of soil biology and its importance to soil health. |
| Soil biology in context | What are the agricultural drivers and practices for improving soil health/biology and why is there an increasing interest from growers? |
| Soil biology – diversity and functions | Concepts of soil health and biology, the diversity and how this links to farm productivity. Latest thinking. |
| Soil biology – nutrient cycling and productivity | Linking soil health and productivity to nutrient cycles including nitrogen and carbon cycling. Latest thinking. |
| Soil biology – plant / microbial interactions | Rhizobia and mychorrizal fungi, their interactions with plants, roles and benefits. Latest thinking. |
| Soil biology – soil fauna | Soil fauna and ecosystem services. Latest thinking. |

*Field site tour…*



## Day 2

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| Soil suppression | Soil suppression – harnessing soil biology for better disease management and higher resource efficiency. Latest thinking |
| Management practices for improving soil health | A practical way of managing soil biology |
| Integrating soil biology/ health into practise | Integrating soil biology in a practical sense – introductory experiences and some adoption barriers. |
| Round-table discussion | Take home message |

## Day 3

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| How to integrate soil biology in nutrient management | What is the key information needed to integrate soil biology in nutrient management decision making? |
| How to integrate soil biology in disease management | What is the key information needed to integrate soil biology in effective disease management decision making? |
| How to improve soil biology/health to make farming systems more resilient and profitable | Agronomic practices that improve soil health and their linkage to profitability and resilience. |
| Round table discussion | Participants works in different groups each with a scenario that they have to overcome and present how to overcome constraints on productivity and resilience |

## Day 4

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| Biological Indicators of soil health | An overview of available biological indicators of soil health and productivity and how to interpret those indicator reports. |
| Certificate Quiz | At the end of the second day participants will take part in a short Quiz to their knowledge and understanding of the principals of soil biology and how it can be harnessed to achieve sustainable outcomes |

## Presenters.

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| **Professor Brajesh Singh** | Professor Brajesh Singh is an internationally recognised expert in the field of microbial ecology. His research interests encompass functional microbial ecology, climate change and environmental biotechnology with particular focus on the role of microbes in ecosystem function and environmental sustainability. |
| **Dr Eleonora Egidi** | Dr Eleonora Egidi is aiming to identify and understand how plants and their associated microbiota, recognise and coordinate development and enable this ecosystem to survive under less than ideal conditions. |
| **Assoc Prof Uffe Nielsen** | Assoc Prof Uffe Nielsen is broadly interested in community and ecosystem ecology, and the link between the two, i.e. how do changes in one influence the other.<br>In a time where large-scale changes in land use and climate are impacting ecosystems across the globe it is essential for human well-being to acquire knowledge of the potential implications of these changes. For instance, species gains and losses, and changes in community composition, belowground due to climate changes can impact nutrient cycling, which may lead to changes in aboveground communities and potentially limit productivity of agricultural lands. |
| **Dr Catriona Macdonald** | Dr Catriona Macdonald investigates the impacts of environmental change on nutrient cycling and resource allocation within terrestrial environments. Her research interests are geared towards understanding how environmental change impacts nutrient cycling and ecosystem functioning and how this affects productivity and sustainability of soils. |
| **Two Invited speakers** | Agronomic practices and soil health data |