

EXPLORING THE HIDDEN WORLD OF MICROBES

A course curriculum to enhance farmer microbial literacy

COURSE PURPOSE: The primary purpose of this course is to render the invisible world of microbes visible to farmers. This course offers introductory science-based instruction exploring the diverse applications of microbes on farms.

INTENDED AUDIENCE: This curriculum is designed for farmers seeking to enhance their foundational microbial knowledge. This material can also assist extension agents, citizen scientists and other non-experts wanting to explore the hidden world of microbes.

CURRICULUM OUTLINE:

UNIT 1: *What microbes are living in my soil?*

Module 1: Key players in the soil food web

Module 2: Clarifying central definitions

Module 3: Quantifying soil microbial biodiversity

Module 4: Introduction to soil fungi

Module 5: Introduction to soil bacteria

UNIT 2: *How to microbes benefit the farm?*

Module 1: Microbe and plant co-evolution

Module 2: The rhizosphere effect

Module 3: Mycorrhizal fungi

Module 4: Nitrogen fixation

Module 5: Disease suppressive soils

UNIT 3: *How do current agricultural practices harm microbes?*

Module 1: The war on microbes

Module 2: Microbes and tillage

Module 3: Microbes and pesticides

Module 4: Microbes and fertilizers

Module 5: The story of microbes and glyphosate

UNIT 4: *How can we build a microbially-assisted agriculture?*

Module 1: What on-farm practices support microbial diversity?

Module 2: Does working with microbes make economic sense?

Module 3: What are methods for monitoring microbes on the farm?

Module 4: How can we build farmer education networks?