

SUSTAINABLE SOIL MANAGEMENT IS MORE THAN WHAT AND HOW CROPS ARE GROWN

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Abstract: The title of this chapter is „Sustainable Soil Management Is More Than What and How Crops Are Grown.” Not only how and what crops are grown matters but also the interactions of the two in space and time lead to effects and consequences that influence system performance and delivery of ecosystem services. Some ecosystem services involve processes such as hydrological, carbon, and nutrient cycling that operate at the level of the fields on farms, landscapes, watersheds, and beyond. In addition, agricultural soil management is undertaken within different farming systems for the purpose of producing biological products for markets, and a range of production inputs, equipment and machinery, and management skills are needed to operate successfully.

Keywords: sustainable soil management, sustainable agriculture, conservation agriculture systems, ecosystem services, biological products

Our overall conclusion is that sustainable soil management as a basis for sustainable agricultural production is essential and practicable, but depends on both how and what crops are grown, as well as on the engagement of all stakeholders who are aligned toward transforming the unsustainable tillage-based farming systems to conservation agriculture systems regardless of soil, climate, and farmers' economic capacity to invest. It is possible to develop a sustainable production system based on how and what crops are grown but always following CA principles. This would allow the maintenance of the underpinnings of ecological sustainability of production systems in good order so that sustainable production of food and other ecosystem services becomes the norm. This transformational change is now occurring worldwide on all continents and ecologies and covers nearly 10% of the global arable land.

INTRODUCTION

Soil management in agricultural landscapes should deploy production practices that are in harmony with soil-mediated ecosystem functions if they are to deliver a broad range of ecosystem services. Such services include edible and nonedible biological products, clean drinking water, processes that decompose and transform organic matter, and cleaning processes that maintain air quality. Several categories of ecosystem services are recognized: provisioning, regulating, cultural, and supporting (Millennium Ecosystem Assessment [MEA], 2005). In agricultural landscapes, provisioning ecosystem services can be delivered effectively and efficiently when the linked regulatory and supporting services are allowed to operate normally. Ecosystem functions that protect and enhance regulatory and supporting ecosystem services in the soil and landscape in which crops are grown appear, in general, to offer an effective way of harnessing the best productivity, ecological, and economic performances.