

**Lijbert Brussaard: Biodiversity and ecosystem services in agricultural landscapes: what role for soils?  
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Ecosystem services are the benefits people derive from nature, one of which is the production of agricultural goods. Without neglecting *tradeoffs* between agricultural production on the one hand and biodiversity and associated ecosystem services on the other, the challenge we face is to explore and enhance the *synergies* between the two in agricultural landscapes, so as to maintain the living soil as natural capital from which ecosystem services flow as interest. This challenge is huge because soils and soil biodiversity are rarely explicitly incorporated in this search, neither by sister disciplines, nor by stakeholders in land management decision-making, partly because soil (biodiversity) is literally and figuratively invisible to them.

Zooming in from global to local scales, I will explore how to develop and mainstream soil ecological knowledge in the search for sustainable management of agricultural landscapes, linking up with recent developments in trait-based ecology.

Trait-based ecology so far is largely the domain of plant ecology. However, environmental and management filters that select for plant species with certain traits and trait combinations also operate for soil organisms. Perhaps more importantly, they operate within and across trophic levels, affecting ecosystem functioning and ecosystem services. I will give some examples from the soil biota that suggest that functional trait diversity is a more useful concept than the traditional concept of “functional” groups in food webs, or eco-morphological groups.

I will place these thoughts in the quest for the research challenges ahead to let us work with nature in order to:

- reduce external inputs in intensive agriculture (such as fertilizers for nutrient supply, pesticides for pest and disease control, and tillage for soil structure maintenance) and enhance the soil-based ecosystem services they bypassed for higher productivity
- restore other ecosystem services that were affected in the process (such as regulation of water quality and quantity and greenhouse gas control)
- design novel combinations of productive and non-productive landscape elements for optimized production of agricultural goods and ecosystem services.

Finally, I will draw some conclusions on the agenda soil scientists should set to make their knowledge more relevant in scientific developments and debates in the natural and social sciences at large, as well as in societal debates on the grand challenges of our time.