Tropentag, September 10-12, 2025, hybrid conference

"Reconcile land system changes
with planetary health"

Healing the planet through regenerative land systems: from diets to soil microbiomes

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Abstract

The accelerating degradation of land, water, and biodiversity is not merely an environmental issue – it is a systemic failure rooted in how we produce food. Today's industrial agricultural model, characterised by monocultures, heavy chemical inputs, and the separation of livestock from crop production, has led to unhealthy soils, nutrient-deficient crops, polluted water bodies, and rising levels of chronic disease. This presentation argues that restoring planetary health requires a fundamental redesign of our land systems – shifting from extractive, input-dependent practices to regenerative, biology-based farming models.

We explore the cascading impacts of land degradation through the lens of soil health, plant vitality, dietary outcomes, and microbial diversity. Special attention is given to the ecological consequences of tillage, synthetic fertilisers, and pest-centric management, alongside the overlooked value of indicator species such as opportunistic weeds. In regenerative systems, weeds are no longer enemies – they are diagnostic tools that signal underlying soil conditions. Similarly, the presence or absence of pests reflects system imbalance rather than a need for intervention. This presentation challenges conventional pest and weed paradigms and emphasises agroecological processes that foster self-regulating ecosystems.

Agroforestry, contour farming, integration of livestock, perennial root systems, and continuous soil cover emerge as key pillars for building climate-resilient, nutrient-dense food systems. Cutting-edge machinery such as wide-span no-till platforms (e.g., NEXAT) and precision seeders (e.g., Cross-Slot, T-Force Plus) are highlighted as scalable tools for transitioning even large-scale farming to regenerative systems without compromising productivity.

Finally, the presentation questions whether certified organic farming – often focused on substituting inputs – can truly regenerate landscapes without embracing core regenerative principles. The argument is made that planetary health depends not on the absence of chemicals alone, but on the presence of life: diverse, interconnected, and resilient at every level of the food web.

Keywords: Contour farming, cover crops, ecosystem restoration, food systems, indicator plants, input substitution, livestock integration, perennial plants, pest resilience, regenerative agriculture, sustainable diets

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