



Gernot Bodner

**Senior Scientist and Deputy Head of the
Institute of Agronomy at the University of
Natural Resources and Life Sciences,
Vienna (BOKU).**

Panel 3



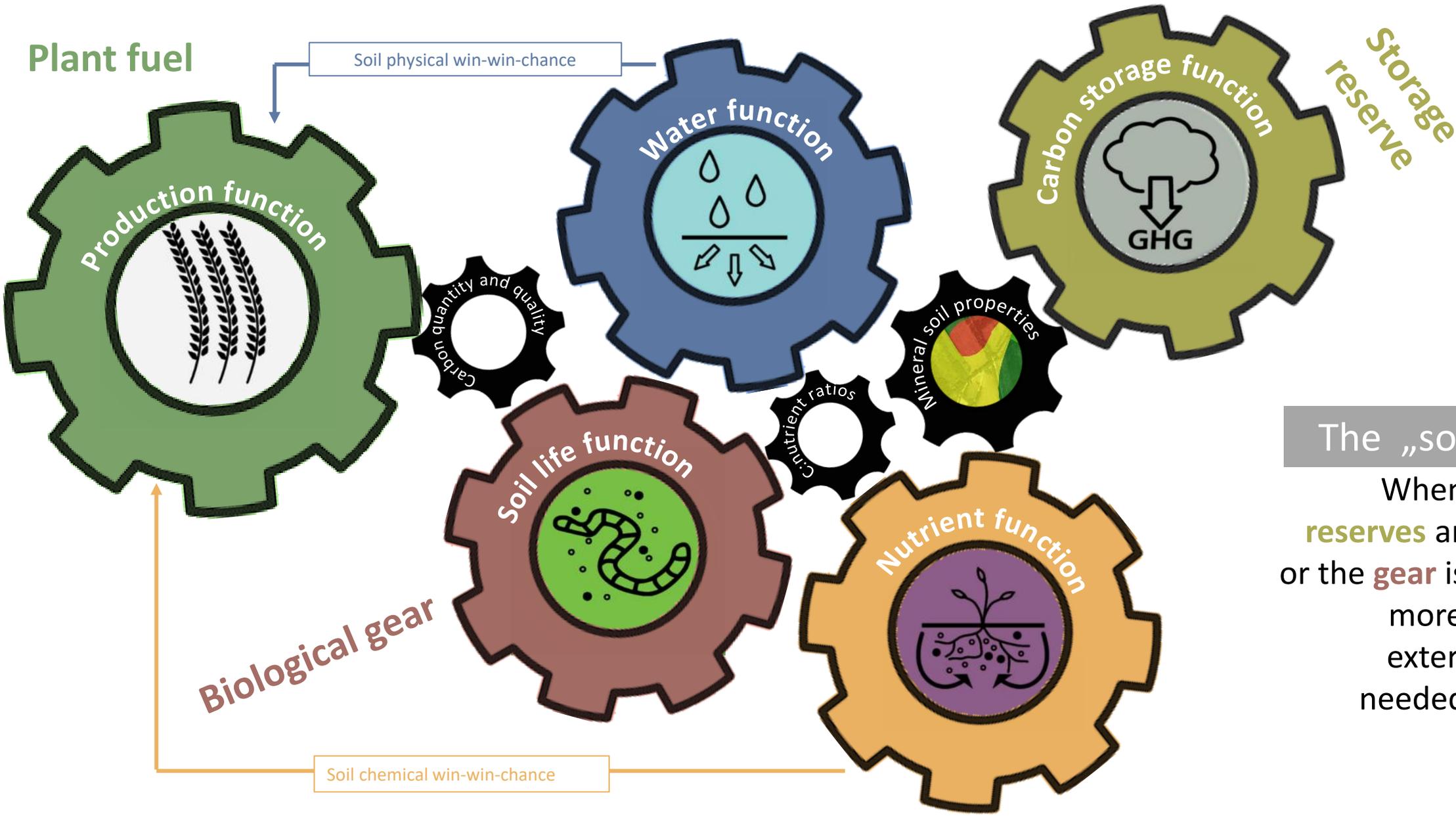
Scientific practice - practical science: A
lighthouse farm network to build soil health

Boden. Pioniere2050

Gernot BODNER

Institute of Agronomy,
Department of Agricultural Sciences
BOKU University

The project soil pioneers is supported by
the Austrian Ministry of Agriculture
BMLUK and the provincial governments



The „soil body“

When **fuel** lacks, **reserves** are depleted or the **gear** is damaged, more and costly external input is needed (**fertilizer**, **irrigation**).

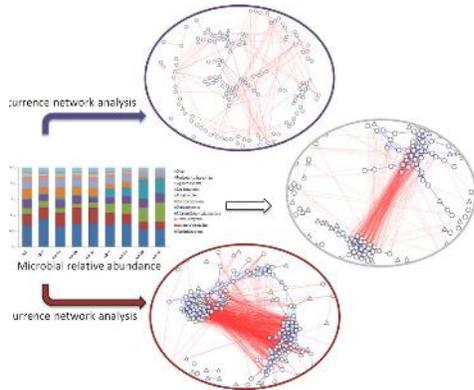
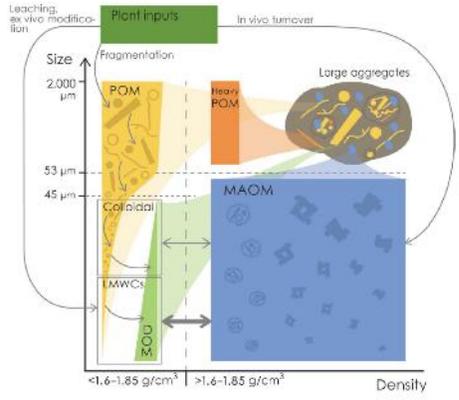
The 5 principles of regenerative agriculture



„Joining organic with conservation agriculture“

Scientists

Trying to understand everything



Boden.Pioniere

Farmers

Trying to manage everything



A group photo of approximately 20 people, likely the 'Boden.Pioniere' team, standing in front of a modern building. Surrounding the photo are logos of partner organizations: BOKU UNIVERSITY, BODEN.LEBEN, BW BODEN.WASSER.SCHUTZ BERATUNG, MYHUMUS, Bundesamt für Wasserwirtschaft, HUMUS BEWEGUNG, and Bio AUSTRIA.

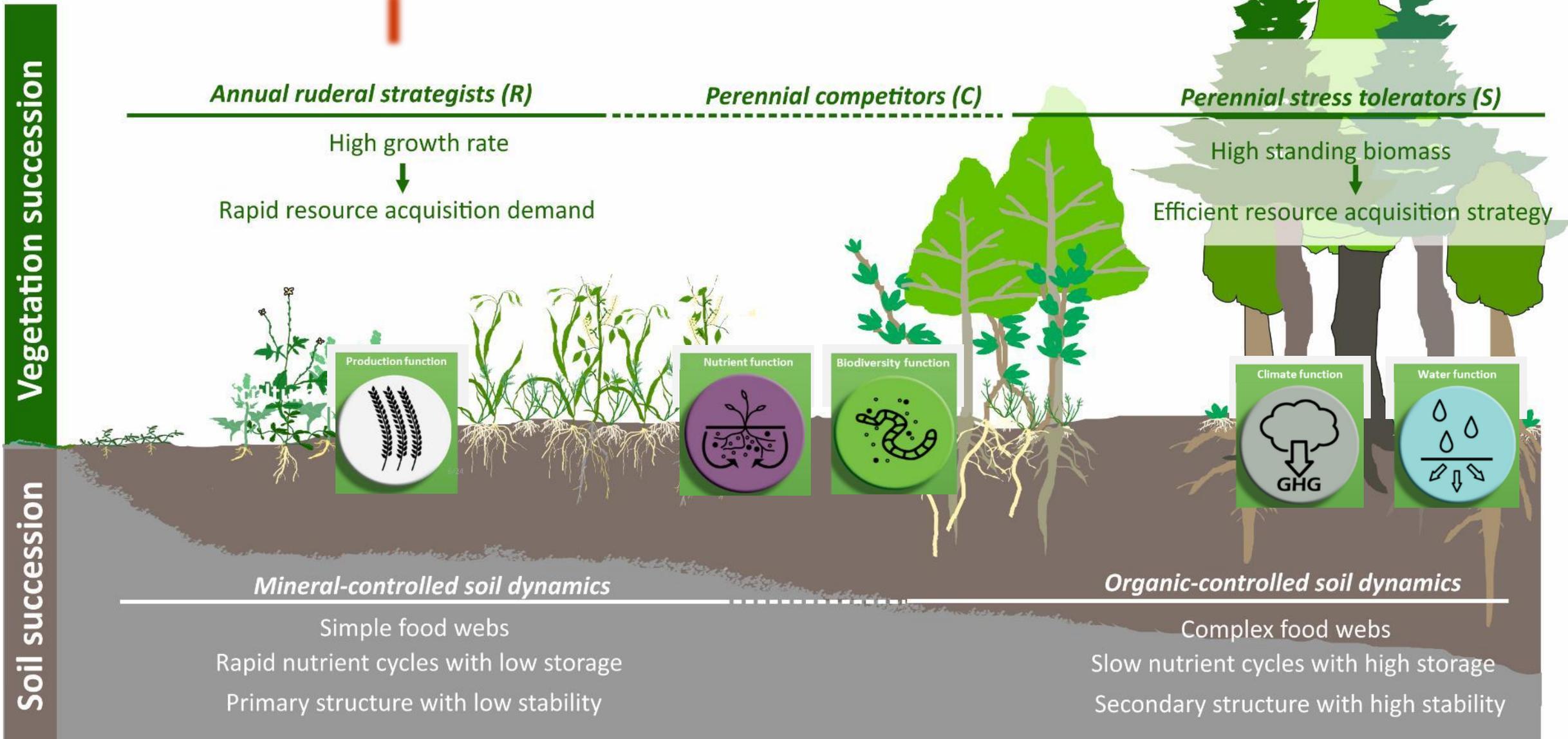
Understanding how soils work

Evidences for innovation advances

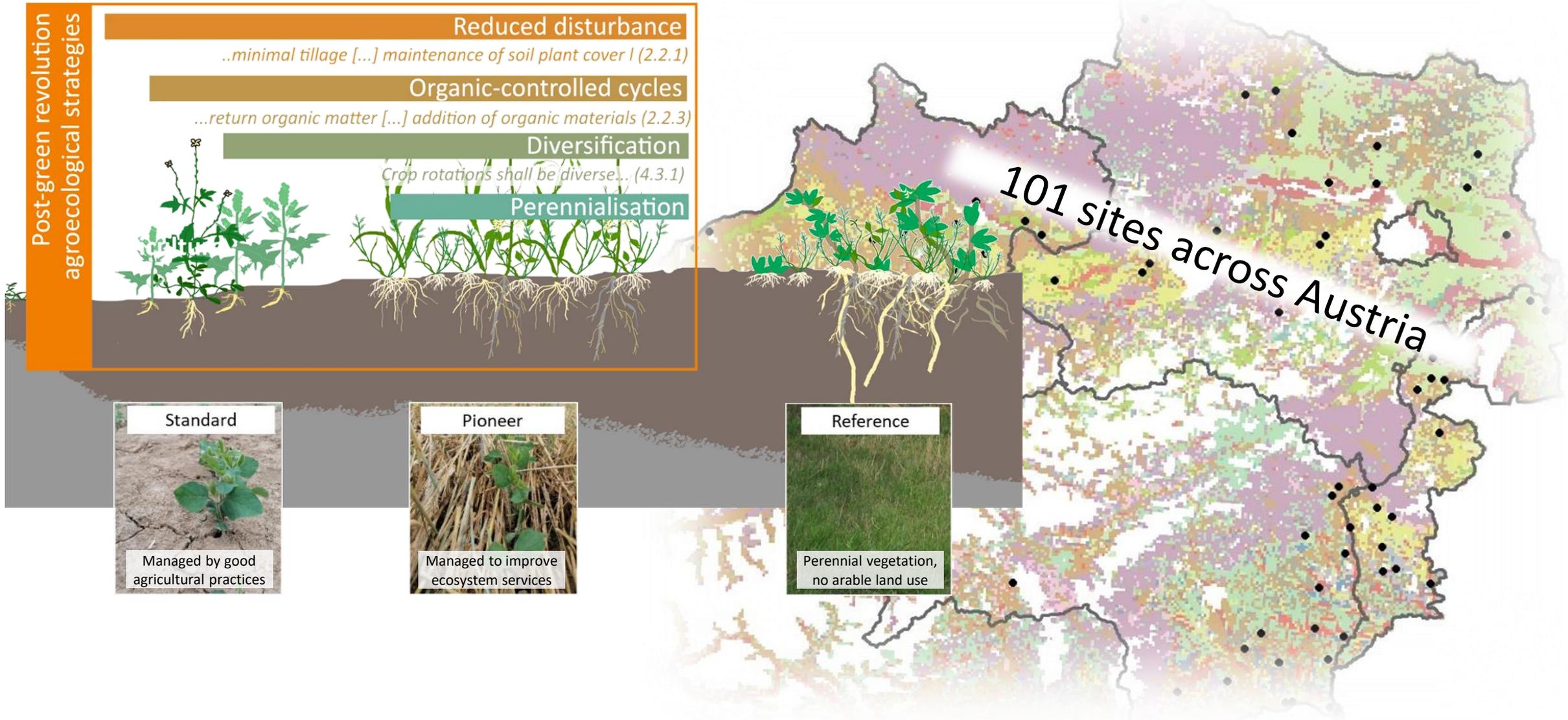
Bilder aus: Price et al. 2021, Sci Tot Env 751; Lavallee et al. 2020, GCB 26

Fotos: © K. Keiblinger (oben), G. Bodner (unten)

Arable land ≠ „nature“...

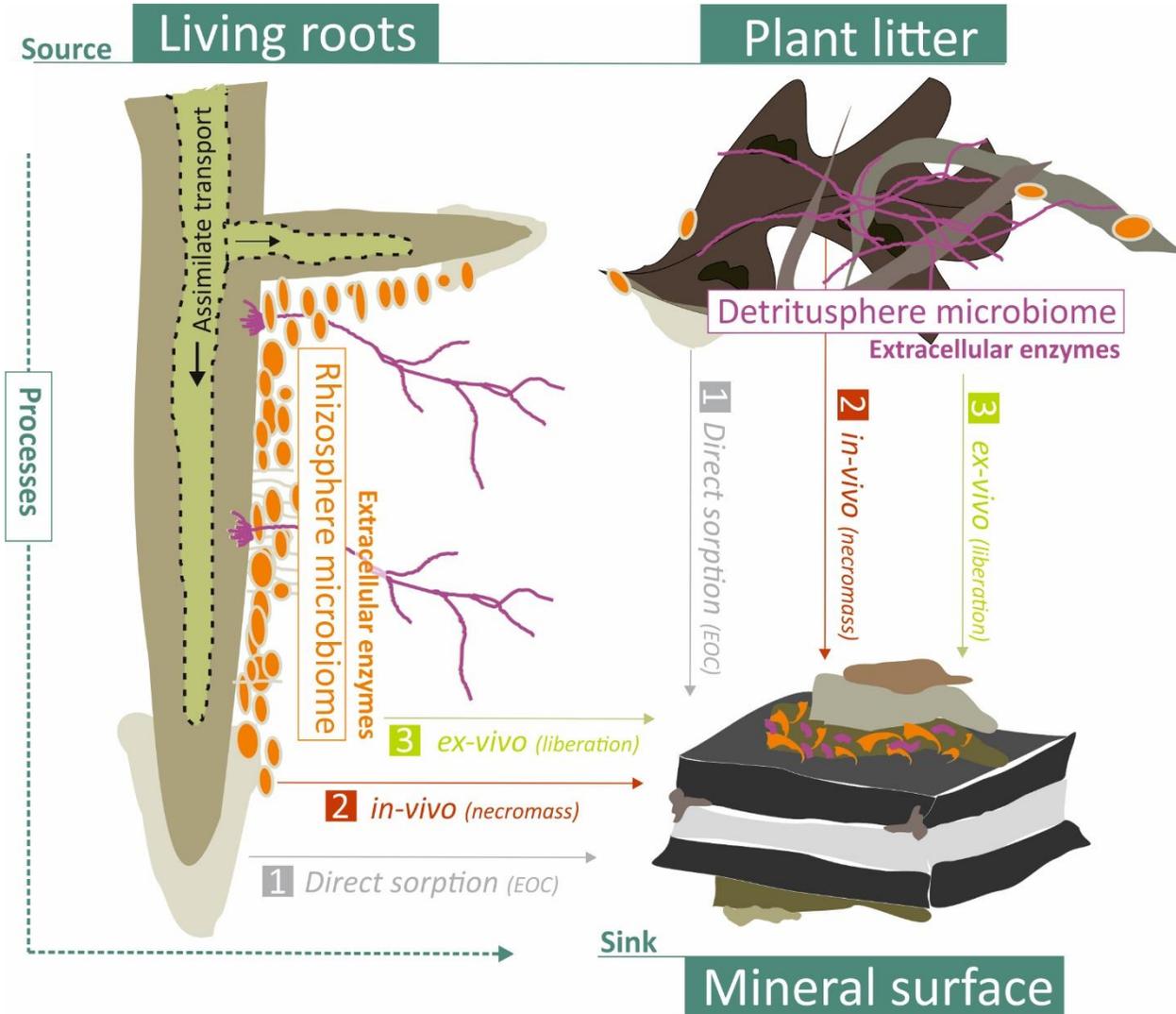


... but let's see how far **Soil Pioneers** can come.

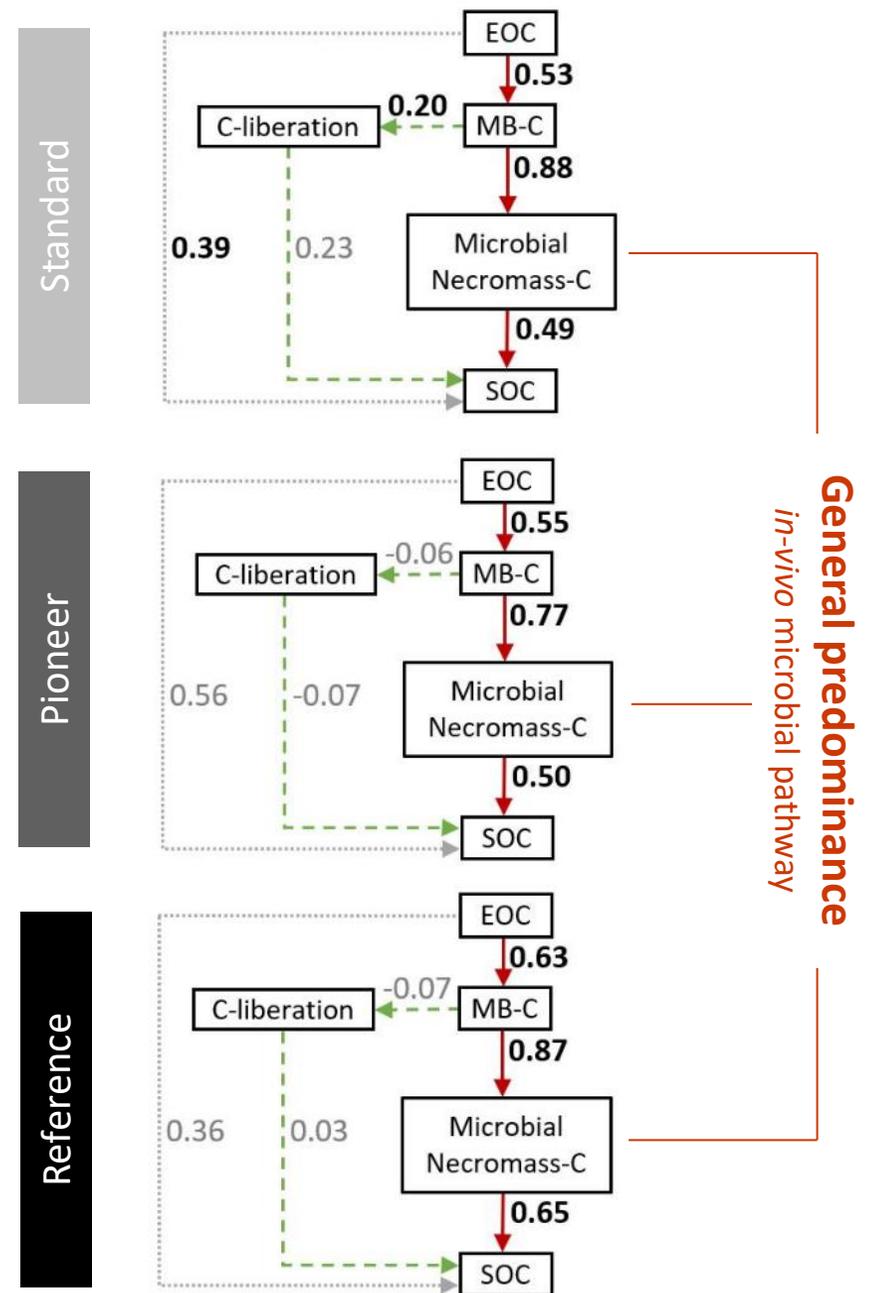


How they make soil work ...

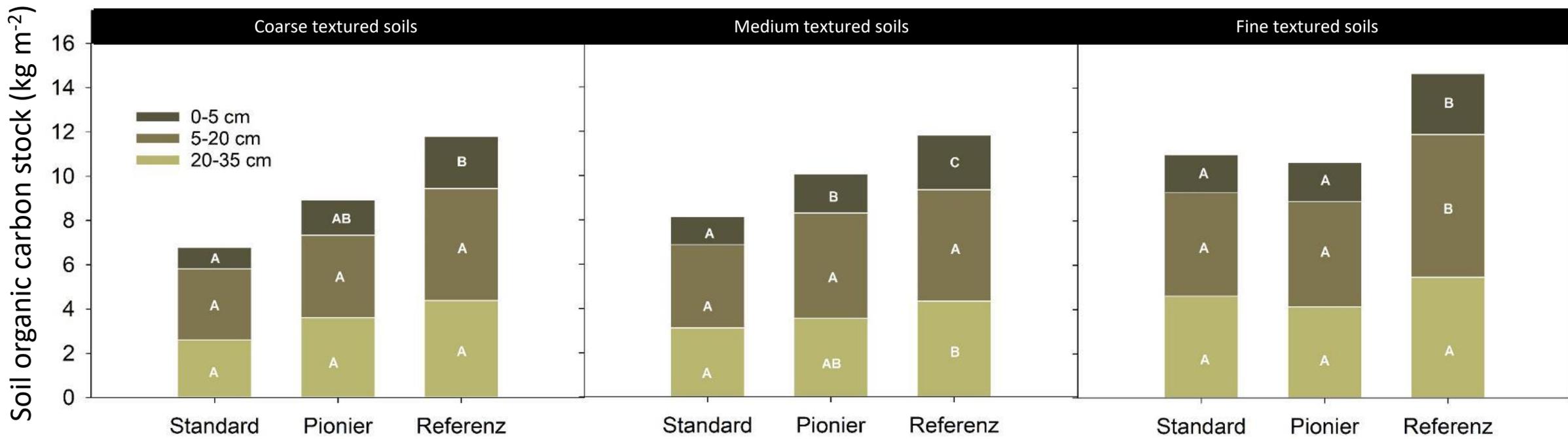
The role of microbes



Graph ©G. Bodner



Soil organic matter ...a mitigation contribution

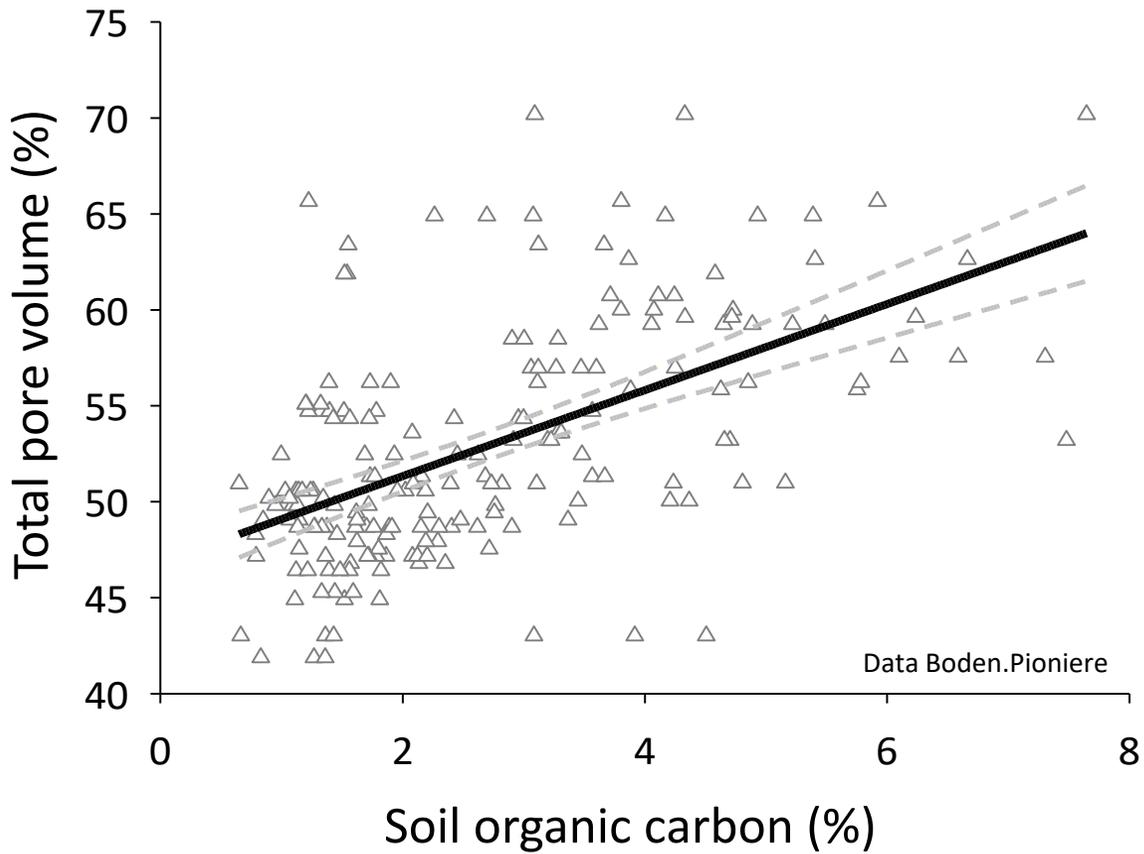


Potential of change

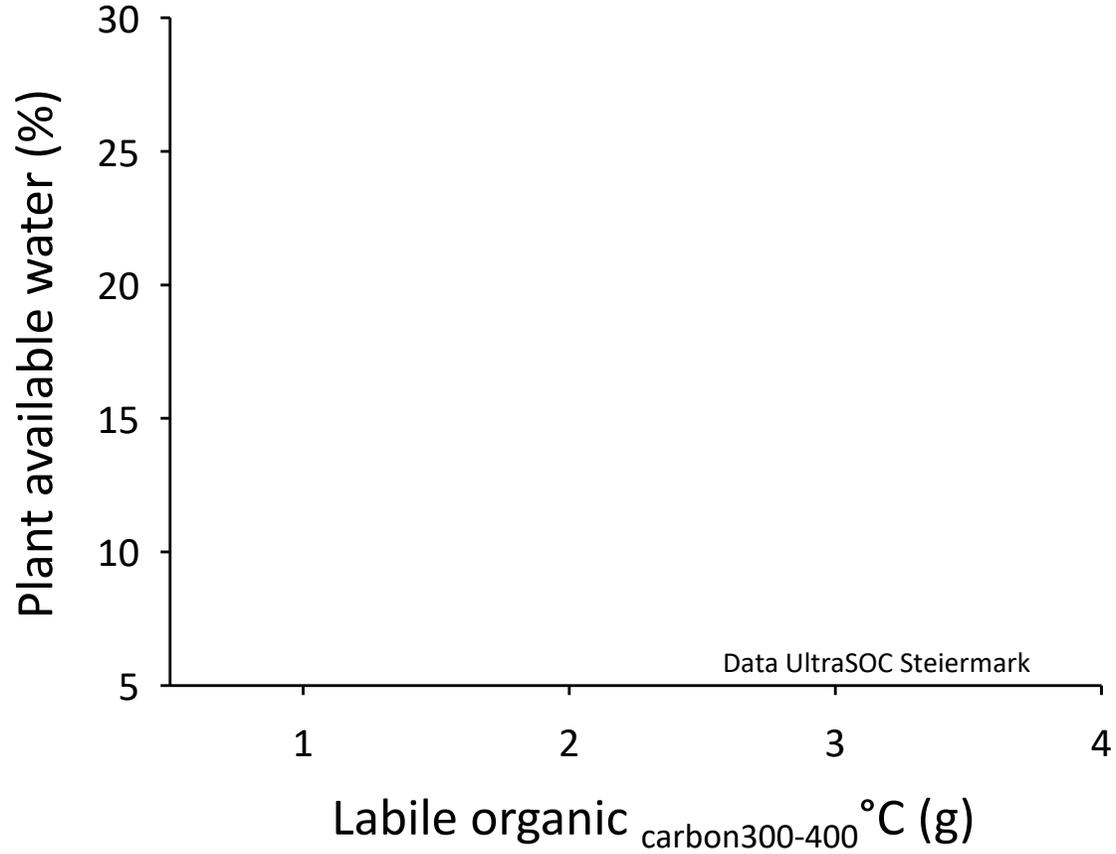
Coarse textured soils < 15 % clay	Medium textured soils 15 – 25 % clay	Fine textured soils > 25 % clay
Pioneer vs. Standard: +37 % Reference vs. Standard: + 95 %	Pioneer vs. Standard: +26 % Reference vs. Standard: + 56 %	Pioneer vs. Standard: - 2 % Reference vs. Standard: + 38 %

Soil organic matter ...an adaptation contribution

Growth factor oxygen

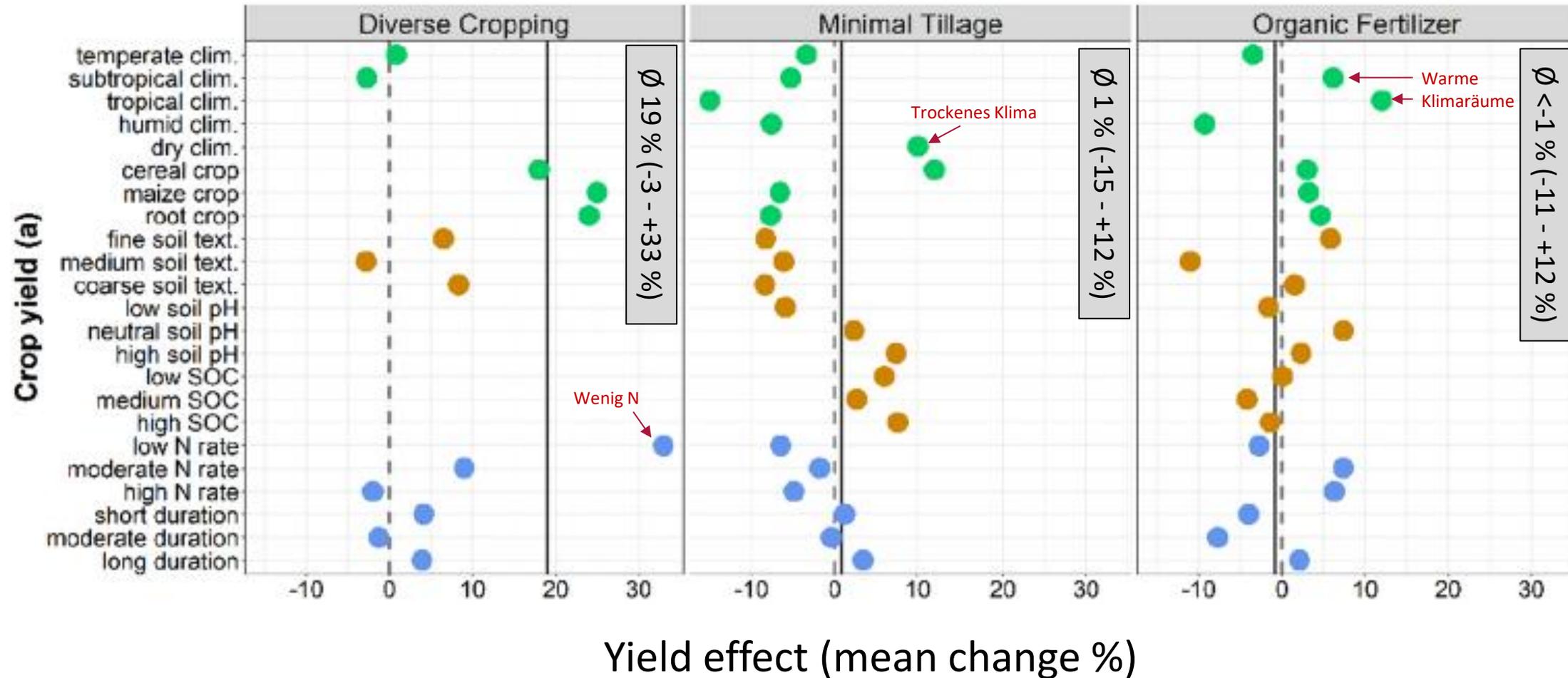


Growth factor water



„Copying“ from nature successfully = diversification

Rotations, cover crops. Intercropping, species mixtures, variety mixtures, life histories, phylogenetic distance, functional diversity



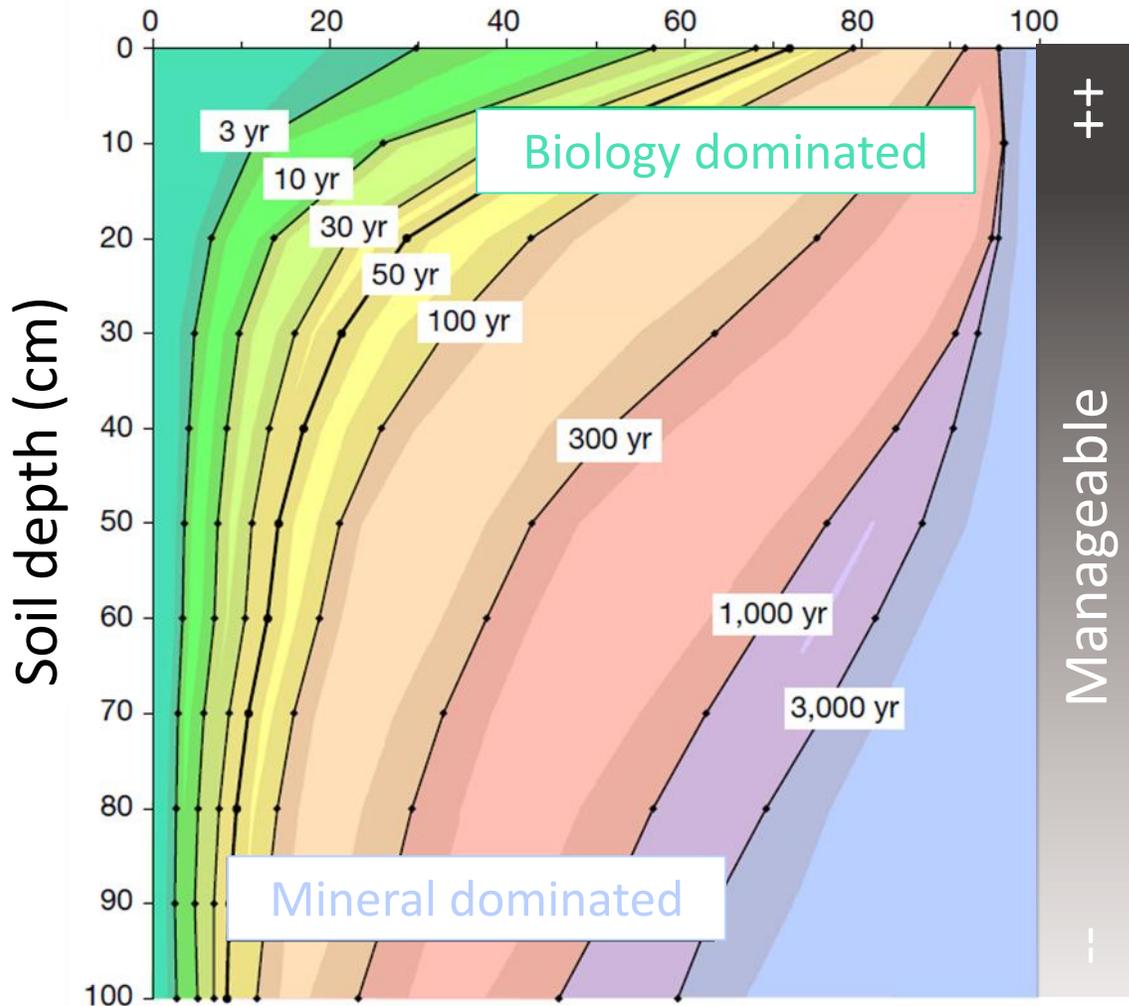
*Diverse cropping, intercropping, cover crops, mixed cropping

Young, M. D., Ros, G. H., & de Vries, W. (2021). Impacts of agronomic measures on crop, soil, and environmental indicators: A review and synthesis of meta-analysis. *Agriculture, Ecosystems & Environment*, 319, 107551.

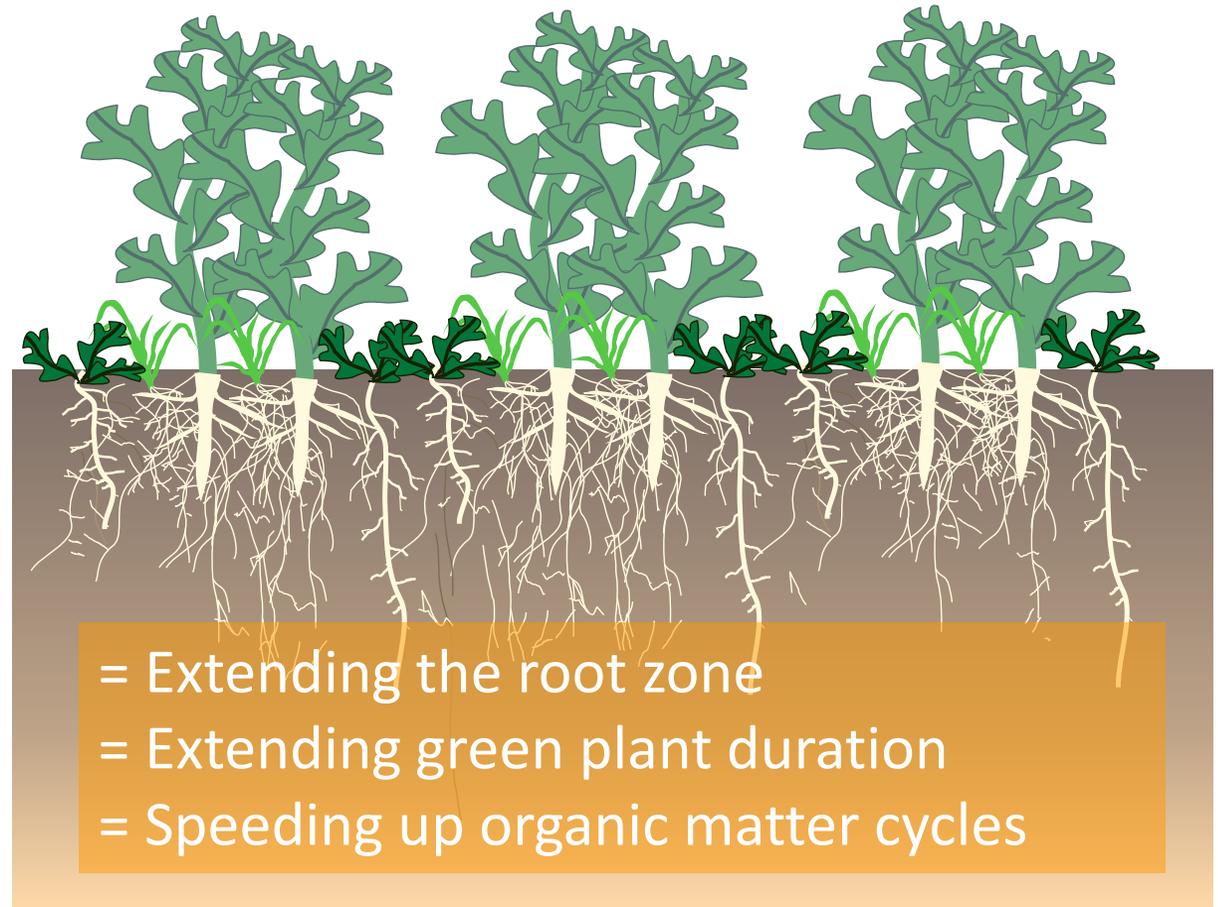
Managing humus means ...

...managing the soil life - the gear of the fertile soil

Distribution of carbon age (%)



Balesdent et al (2020). Nature 559.



The SoilPioneer team



Some more information on our group,
methods, projects, publications ...

<https://boku.ac.at/bodenpioniere>

