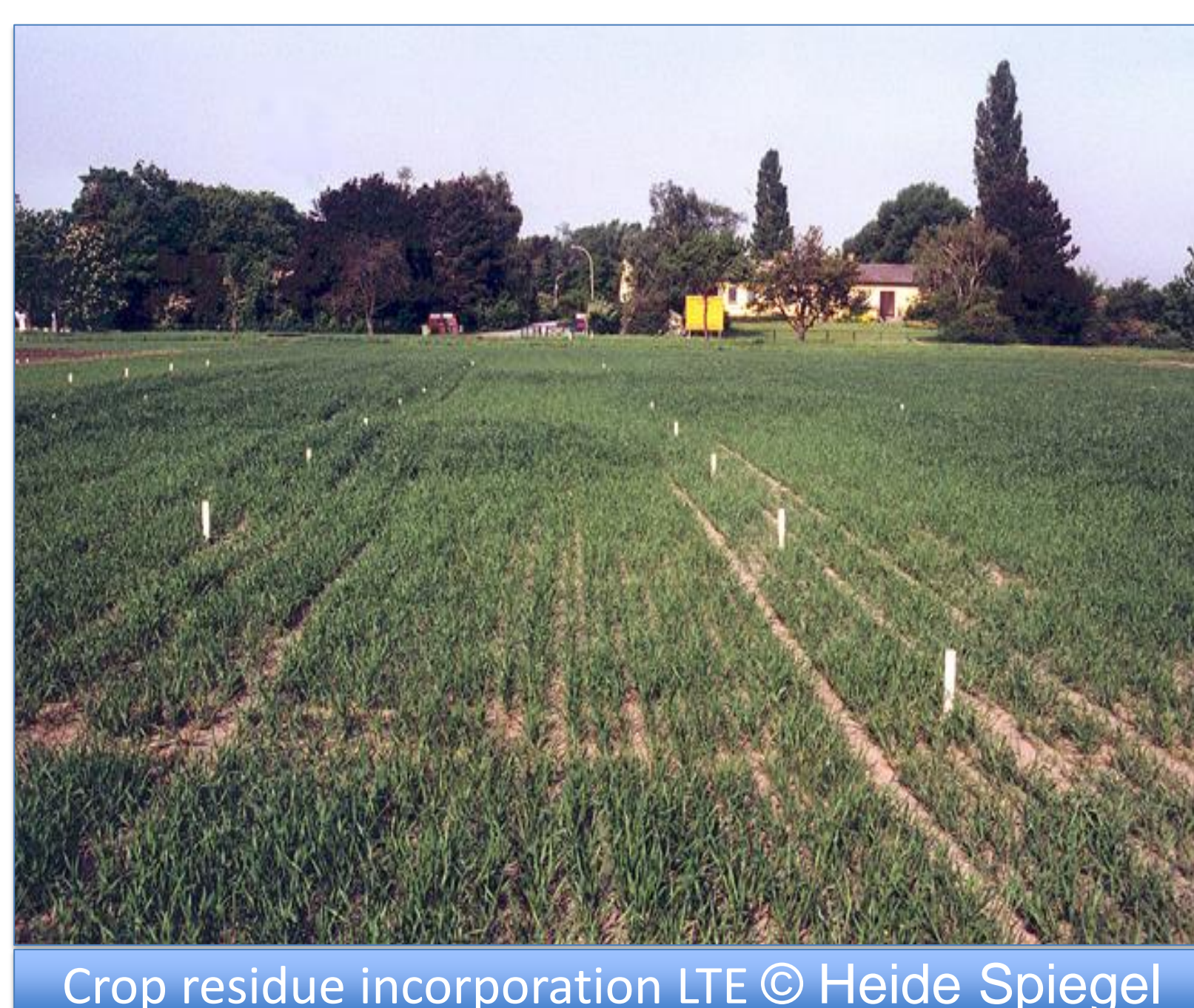


Agricultural long-term experiments as a basis to monitor soil organic carbon

Agricultural long-term field experiments (LTEs) hold a key to understanding how the improved management practices (IMPs) such as different tillage practices, crop residue incorporation or compost amendments affect soil organic carbon (SOC). AGES is managing LTEs with these IMPs and has followed the development of SOC in those soils for a couple of decades. LTEs are living laboratories that enable researchers and policy-makers to gain a deeper understanding of the trends and dynamics of change, rather than a short snapshot of the situation. LTEs indeed enable to monitor changes in specific soil functions, such as carbon storage, which is often said to be challenging (Sachs et al., 2010; Baveye et al., 2016).



Tillage LTE © Heide Spiegel



Crop residue incorporation LTE © Heide Spiegel



Compost LTE © Heide Spiegel

❑ Significant increases in soil organic carbon contents followed by improved management practices

➤ Tillage LTE in Fuchsenbigl

Minimum tillage resulted in significantly higher SOC concentrations at 0-10 cm soil depth (20.17 g kg^{-1}), compared to reduced and conventional tillage (16.00 and 16.20 g kg^{-1}), after 24 years of improved management practice. At the deeper soil depths no significant differences were observed.

➤ Crop residue incorporation LTEs in Rutzendorf and Rottenhaus

Crop residue incorporation increased the SOC concentrations significantly in two different LTEs (22.00 and 9.29 g kg^{-1}), compared to crop residue removal (20.58 and 8.43 g kg^{-1}), after 30 and 26 years, respectively.

➤ Compost LTE in Ritzlhof

Urban organic waste compost and sewage sludge compost resulted in significantly higher SOC concentrations (14.00 and 14.75 g kg^{-1}) compared to the control treatment (11.85 g kg^{-1}), after 21 years.

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LTEs demonstrate the importance of long-term monitoring sites in following the development of SOC.

