

Liquid manure application in spring – are soil conserving techniques available?

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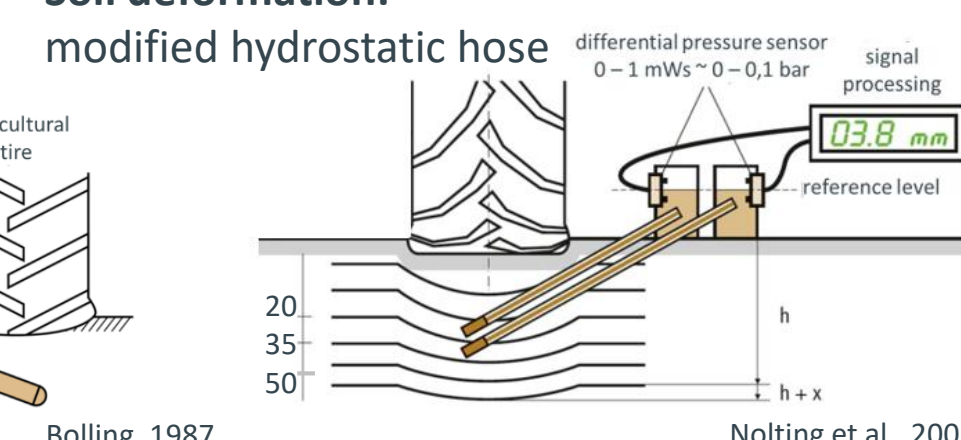
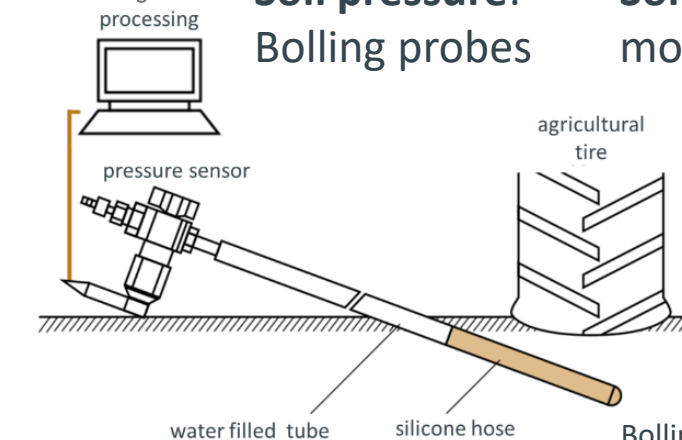
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Introduction and aim of the study

- Sizes and weights of agricultural machinery increased significantly over the last decades
- Wet soil conditions and high wheel loads can cause major concern regarding the risk of soil compaction
- Amendment of the German fertilizer ordinance will result in an increase of liquid manure and digestate application rates in spring
- Heavy slurry tanks can cause harmful soil compaction and thus can affect soil functions
- Aim of this study:** Investigation of the influence of three different application techniques on soil pressure and deformation as well as on soil structure and functions

Material and methods

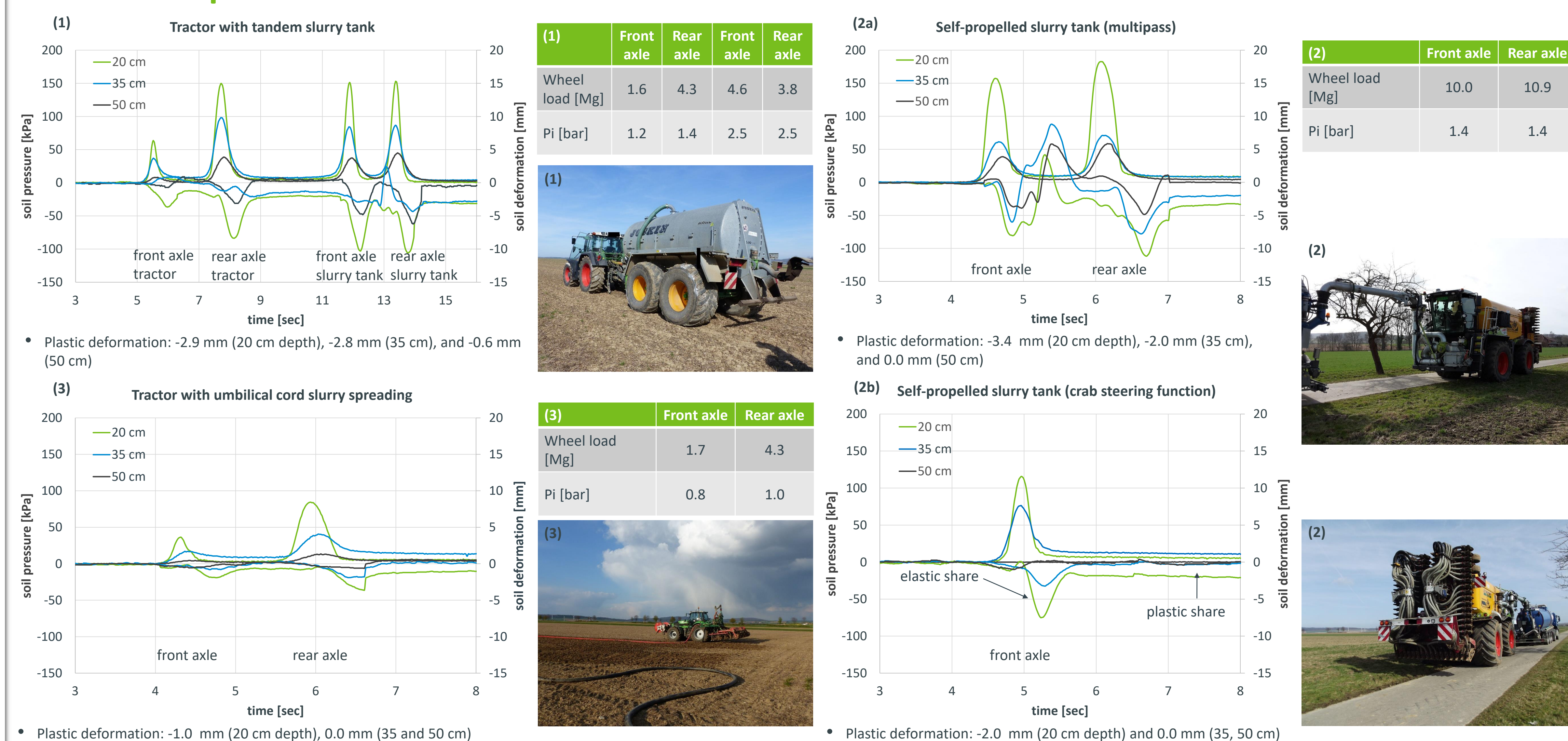
- Three application techniques: 1) tractor with tandem slurry tank, 2) self-propelled slurry tank with multipass (2a) and crab steering function (2b), and 3) tractor with umbilical slurry spreading
- Stagnic Luvisol in Lower Saxony, Germany in spring 2017
- Soil sampling before and after wheeling to determine changes in soil structure and soil functions
- Soil pressure [kPa] and soil deformation [mm]: measured in-situ with a multi-channel measuring device



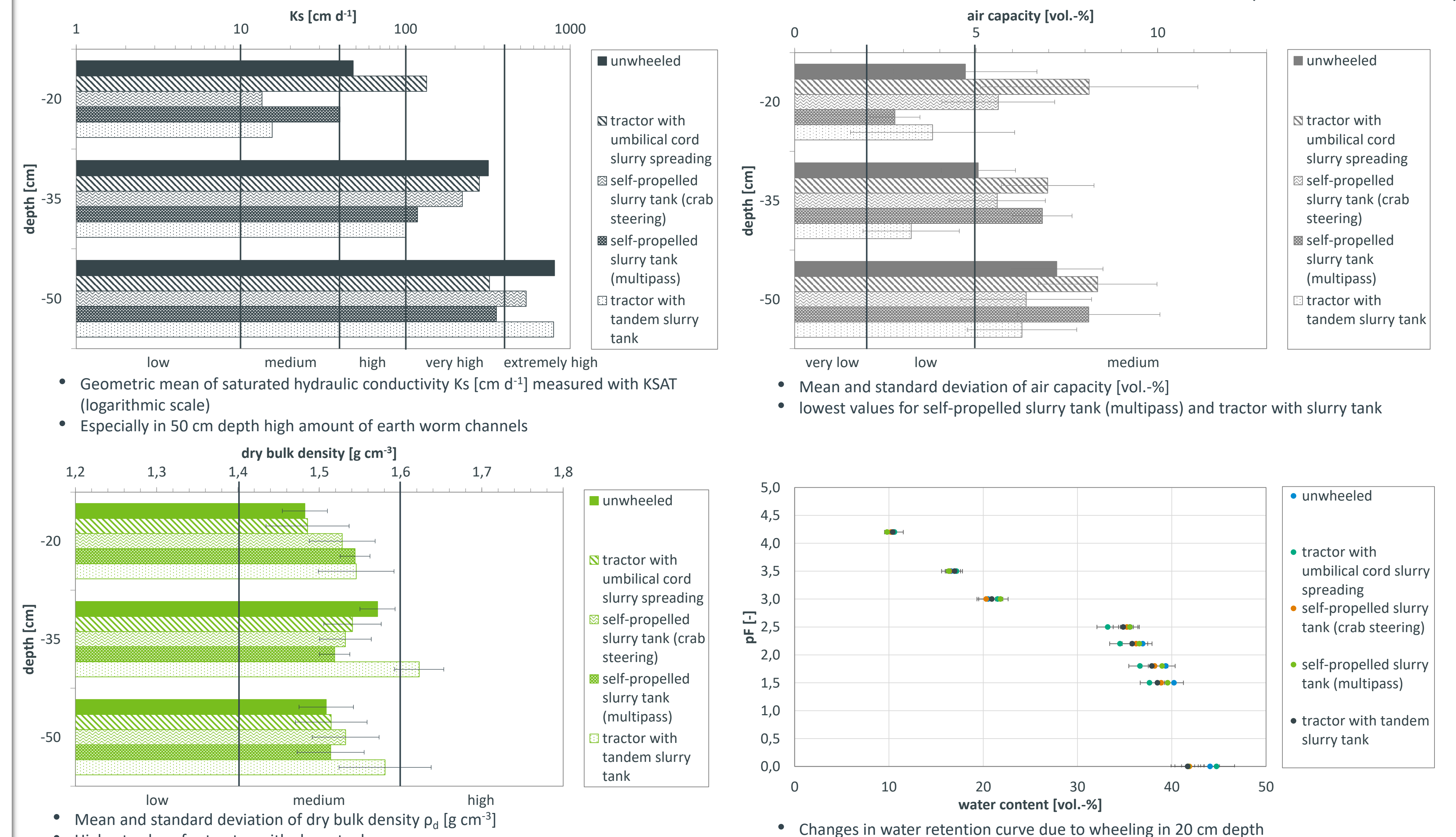
Discussion and conclusion

- Technique 3 was the most soil conserving application technique with lowest values for soil pressure and deformation and highest values for air capacity and Ks
- Technique 2b caused low soil deformation in 20 cm depth due to soil conserving crab steering function and tire inflation pressure adapted to soil conditions
- Repeated wheeling (2a) results in higher soil deformation in 20 and 35 cm depth and has a bigger impact on soil functions
- Technique 1 shows highest values for soil deformation in 20, 35, and 50 cm and an impact on subsoil layer soil functions
- Liquid manure spreading in spring can be performed soil conserving by choosing an adapted application technique

Results: soil pressure and soil deformation



Results: soil structure and soil functions



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