# In-field variations of soil

properties and wheel loads

# result in a spatially highly

variable soil compaction risk

### **Evaluating of agricultural field traffic by modelling traffic intensity**



## and related soil compaction risk

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#### **OBJECTIVES**

Soil compaction risk is spatio-temporal dynamic, not only on regional but also on field scale. However, no analyses exist focusing on in-field variation of soil compaction risk. Thus, this study aims to model and analyze the variability of soil compaction risk within fields for different crops.

#### **RESULTS & DISCUSSION**

This is the first approach enabling soil compaction risk analyses for an entire field with such a high spatial resolution (10 cm). The analyses show that soil compaction risk is highly variable on a certain field depending on soil properties and dynamic changes in wheel load.



## (20 Topsoil

cm)

# Subsoil (40 cm)



#### **METHODS**

- A field in northern Germany (silt loam), three years (2016, 2017, 2018), three crops (maize, winter wheat, sugar beet)
- Soil moisture measurements at 30 sites (20, 40 cm depth)
- Further soil measurements at 60 sites (e.g. texture, Corg)
- Application of the "FiTraM"-model (Augustin et al. 2019) for calculating exact traffic lanes and wheel loads
- Application of the "SaSCiA"-model (Kuhwald et al. 2018) for modelling soil compaction risk for different depths

