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Assessing Long-Term Field Experiments of Europe through a geospatial data infrastructure

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Long-Term Field Experiments (LTEs) are agricultural experiments for monitoring soil and crop properties in changing climate conditions and different management practices. These trials were set up on various soil textures and types to reveal the effects of management and environment on crop production and soil resources. Although the LTEs are essential infrastructures for sustainable soil yield and use, LTE-related information was dispersed, thus not easy to find. To close this research gap, we compiled and analyzed the meta-information of the LTEs across Europe and their spatial representation in a geospatial data infrastructure, including a data repository and an LTE overview map developed within the framework of the BonaRes project (BonaRes 2021; Grosse et al. 2021). During the research, LTEs with a minimum duration of 20 years were identified, and the meta-information was collected by extensive literature review and factsheets. In total, 405 LTEs in Europe were identified, clustered in different categories (management operations, land use, duration, status, etc.), and these clusters were geospatially analysed to provide inputs for the agricultural industry, scientists and decision-makers. LTEs from 25 countries were utilized including Germany, where the oldest LTE started in 1843. The majority of the LTEs have the fertilization treatment, followed by crop rotation and tillage. The results will help to develop a mutual agricultural management framework by revealing the LTE potential internationally. The geospatial data structure will contribute to scaling up the management practices from site to landscape-level for increasing the adaptation of agricultural systems to climate change.

Key Words: Long-Term Field Experiments, BonaRes, Europe, soil science, GIS.

References

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