

# **Agricultural practices shape fungal communities at microgeographic scales**

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Soil fungal communities play an essential part in nutrient cycling and carbon storage and are thus critical for the functioning of terrestrial ecosystems. Anthropogenic disturbances such as tillage, fertilization, and crop rotation have been identified as main drivers of biodiversity loss in soils. However, the extent of this effect on fungal communities is still underexplored. Here, we addressed the impact of agricultural practices on the biodiversity of topsoil fungal communities at different spatial scales. High-throughput sequencing of the ITS2 region was used to characterize abundance, diversity and community compositions along the border of low-disturbance grass verges and the adjacent croplands. We identified a total of 4'651 fungal ASVs in the Swiss lowland agricultural landscape. Alpha diversity did not differ among sampling localities or land uses. However, beta diversity analyses showed that fungal community structures are sensitive to agricultural management. Croplands harboured a greater proportion of pathotrophic and saprotrophic taxa with Ascomycota being the most dominant phylum across all samples. Community dissimilarity was best explained by different land use of pairwise samples collected within croplands and grass verges within a distance of only 1 m. Our results show that agricultural practises can be key drivers in shaping fungal communities even at microgeographic scales. This brings forth a necessity to take into consideration a broader range of geographic scales to appropriately contextualize community variations among fungal communities in ecological settings.