

# Farm management choice can benefit fungi key to healthy ecosystems

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Farming practices have a significant impact on the diversity of beneficial microbial fungi known to play important roles in crop productivity, soil recovery and maintenance of healthy ecosystems, according to new research published today in the journal *Environmental Microbiology*. The conclusions could have important implications for the way humans manage the agricultural landscape and tackle food security issues.

The study was led by Dr Christopher van der Gast at the Centre for Ecology & Hydrology (CEH), UK and Dr Gary Bending from the University of Warwick, UK.

The research team investigated the distribution of important arbuscular mycorrhizal [fungi](#) (AMF), at nine arable and horticultural farms in England, with [soil](#) collected from both organically and conventionally managed fields at each farm.

The results of the study indicate that farm management has a significant impact on AMF richness, with organic farming shown to promote higher diversity relative to conventional farming.

AMF are a vital component of terrestrial ecosystems, representing a dominant microbial group in most soil habitats. Within the soil AMF form a mutually beneficial relationship with plant roots that is known to have a major impact on above ground ecology and productivity. Previously AMF distribution in space and time, like many microbes that dominate the biodiversity of soils, was poorly understood.

Lead author Dr Christopher van der Gast, an environmental microbiologist at the Centre for Ecology & Hydrology, said, "Our research demonstrates that the way humans manage the landscape can play a key role in determining the distribution of microbial communities at both the local and regional scales."

AMF community composition reflected strains adapted to both local soil conditions and the specific management practice imposed. The findings suggest that conventional management practices dampened local differences in community composition, selecting a limited assemblage of common strains.

Co-author Dr Gary Bending, from the University of Warwick, said, "The work provides us with new understanding which we can use to promote these fungi in agricultural systems. This in turn could improve crop production. With the proportion of the earth's surface which is managed by humans increasing rapidly, this understanding is essential if we are to predict and manage microbial functioning in the environment to meet many of the major challenges faced by human society, such as food supply and the mitigation of climate change. Addressing these challenges, whilst maintaining environmentally sustainable agricultural practices, requires an understanding of microbial diversity."

Provided by Centre for Ecology & Hydrology

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