

Background

Arbuscular mycorrhizal fungi (AMF) play an important role in plant health by improving nutrient and water uptake of their host plants and by providing protection against soil-borne pathogens. Many of the practices of conventional agriculture are known to be deleterious to AM communities. This study was conducted to compare the effect of organic or conventional management.

Methods

Twelve sites with paired organic and conventional fields were selected to cover a wide range of locations, soil types and farming systems. Soil was sampled in February 2003. AMF spores were extracted by sucrose density gradient centrifugation and counted. Colonisation potential was determined using an onion bioassay. After 14 weeks growth roots were stained with aniline blue and the percentage colonisation determined using microscopy.

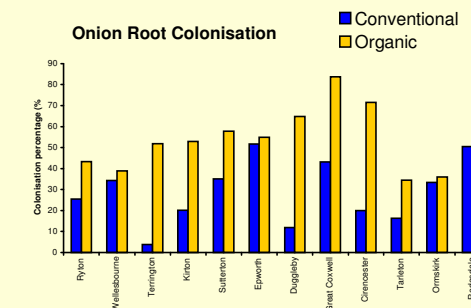
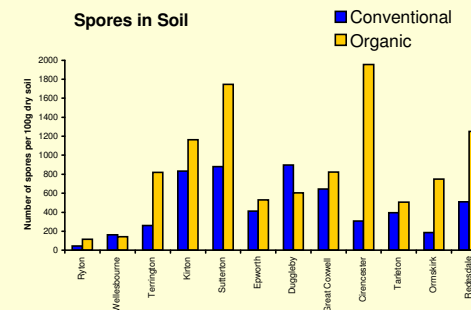
Results

Organically managed soils had significantly higher spore numbers and colonisation potential than conventional ones.

There was no clear relationship between AMF and soil chemistry.

The ratio of spores in organic: conventional management was positively correlated with time since conversion.

A wide variety of AMF spores were seen.



Spores



Colonised roots

Conclusions

Organically managed soils did contain more AMF but there were large site to site differences which could not be explained by simple soil chemistry; a range of management factors are likely to be responsible.

More work is needed to determine the overall importance of AMF in organic systems and the significance of species diversity.