

# Types of mycorrhizal fungi

## Outside or inside?

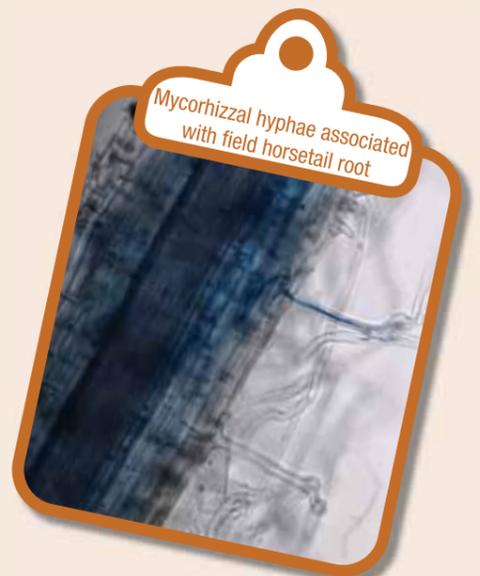
Most mycorrhizal fungi are divided into two broad categories based on whether they live outside or inside the roots:

- Ectomycorrhizal fungi ('ecto' means outside or external) are mostly associated with roots of certain shrubs and trees (e.g. native beech, mānuka, kanuka, pines, oaks). The fungal strands (hyphae) form a sheath around the roots, including the fine feeder roots. The fungal sheath sends out hyphal branches and some extend far out into the soil, but others penetrate between the surface cells of the roots so that nutrients from the soil can be exchanged for sugars from the plants.

They often send up fruiting bodies (reproductive stages), such as many of the mushrooms commonly seen around ectomycorrhizal trees in autumn.

- Endomycorrhizal fungi ('endo' means inside or internal) are more common and associate with herbaceous plants along with many shrubs and trees. The fungal strands (hyphae) grow between the living plant cells inside the roots. These hyphae extend outside the cell and root to form an extensive network that absorbs water and nutrients. Fine specialised structures (called arbuscules) branch and push into living cells to exchange nutrients. Their reproductive stages are very small, mostly formed within the soil, and hence are rarely seen.

There are other more specialised mycorrhizas, including ones that break down soil organic matter to supply plants (e.g. orchids) with organic compounds.



## A partnership that has lasted

Mycorrhizal associations are seen in the fossil record and there is good evidence that they are one of the contributing factors that allowed plants to move from their ocean origin to conquer the land.

