MYCORRHIZAE

The word mycorrhizae literally means fungus roots and defines the intimate associations between plant roots and specialised soil mycorrhizal fungi. In a natural forest, all trees form symbiotic and mutually beneficial associations between their roots and specialised soil fungi.

Pinus pinea

Mycorrhizae (plural) provide many benefits to the seedling and adult trees especially enhancing water and nutrient uptake. Indeed seedlings depend strongly on a healthy root system for survival and growth when planted from the nursery. Evidence of this is when poorly inoculated tree seedlings are planted into a grass environment which is heavily bacterial dominant and the tree turns yellow in colour and makes little new growth.

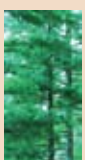
We have all observed a tree struggling in long grass, barely surviving. It is an age old battle between the woody plants and the meadow grasses. Release spraying and mulching not only controls grasses and weeds physically, it also creates a environment around the seedling for the fungal mycorrhizae to proliferate.

Quercus puffball

Appletons collect leaf litter and puffballs from under mature plantations to inoculate new ground, out of pasture, as well as enhancing plant health in existing crops for over 30 years. The benefits of inoculation are most obvious when the seedlings are lifted and both the roots and surrounding soil is white with a spider web effect of hyphae. We also use a liquid formulation produced by Biostart called Mycorrcin, part of a range of biological products available from horticultural merchants.

Forest collected needle litter

Well inoculated Pinus radiata



TWO MAJOR MYCORRHIZAL TYPES PREVAIL AMONG FOREST TREES

Ectomycorrihizae form on the short feeder roots forming the characteristic net of thread like mould growth which colonises the soil. It is within the extensive zone of fungus-root cell contact that nutrients and water are exchanged between fungus and host. The fungus brings in and releases, to the host, nutrients and water and in return receives plant made sugars and other products of photosynthesis. Forest mushrooms, puff balls and truffles are all fruiting bodies of ectomycorrhizae.

Vesicular-arbuscular Mycorrhizae (VA) are strikingly different. They don't have a modified root structure and fungal component is invisible to the naked eye. The VA mycorrhizae forms within the root structure as storage organs and the arbuscles are finely branched structures that extend out from the roots as exchange sites between the fungus and host.

Both species fungal hyphae can explore volumes of soil, hundreds of times greater than tree roots.

Ectomycorrihizae

Pinus	Pines
Betula	Birch
Pseudotsuga	Douglas fir
Abies	Fir
Larix	Larch
Picea	Spruce
Quercus	Oak

Vesicular-arbuscular mycorrhizae

Fraxinus	Ash
Prunus	Cherry
Acer	Maple
Sequoia	Redwood
Liquidamber	Sweetgum