

REVEGETATION

FUNGI WORK FOR HEALTHY TREES, SHRUBS AND SOIL 24 HOURS A DAY WHEATBELT WOODLANDS ARE RICH IN FUNGI

by Inez Tommerup and Neale Boucher

FUNGI are important to soil nutrient cycling processes. They need nurturing in remnant vegetation and re-establishing on farm land. Less than 1% re-establish in revegetation on badly degraded land or farm land. When we put the plants back we should also be putting the fungi back.

Fungi are the ties that bind many woody vegetation nutrient cycling processes together.

Fungi are visible and invisible members of woodland vegetation

Wheatbelt woodlands are rich in fungi. These woodlands have more species of fungi than plants. Fungi are often hidden from view but they are actively growing in soil, on roots and in litter. Fruitbodies are the easily-visible signs that fungi are present. Mushrooms, toadstools, puffballs, brackets, earth stars, horse-hoof, coral, truffles, morels and car-sized giant salmon gum fungus are all fungal fruiting bodies.

Look in woody vegetation litter. All the white and grey mould is fungi actively growing. Mould is like the body of the fungus and fruit bodies with their spores are like the flowers and seeds on plants. Visible mould is masses of fine threads. When mould has a few threads in the strands it is invisible to the naked eye but it is still present and is still doing its work for soil and plant community health.

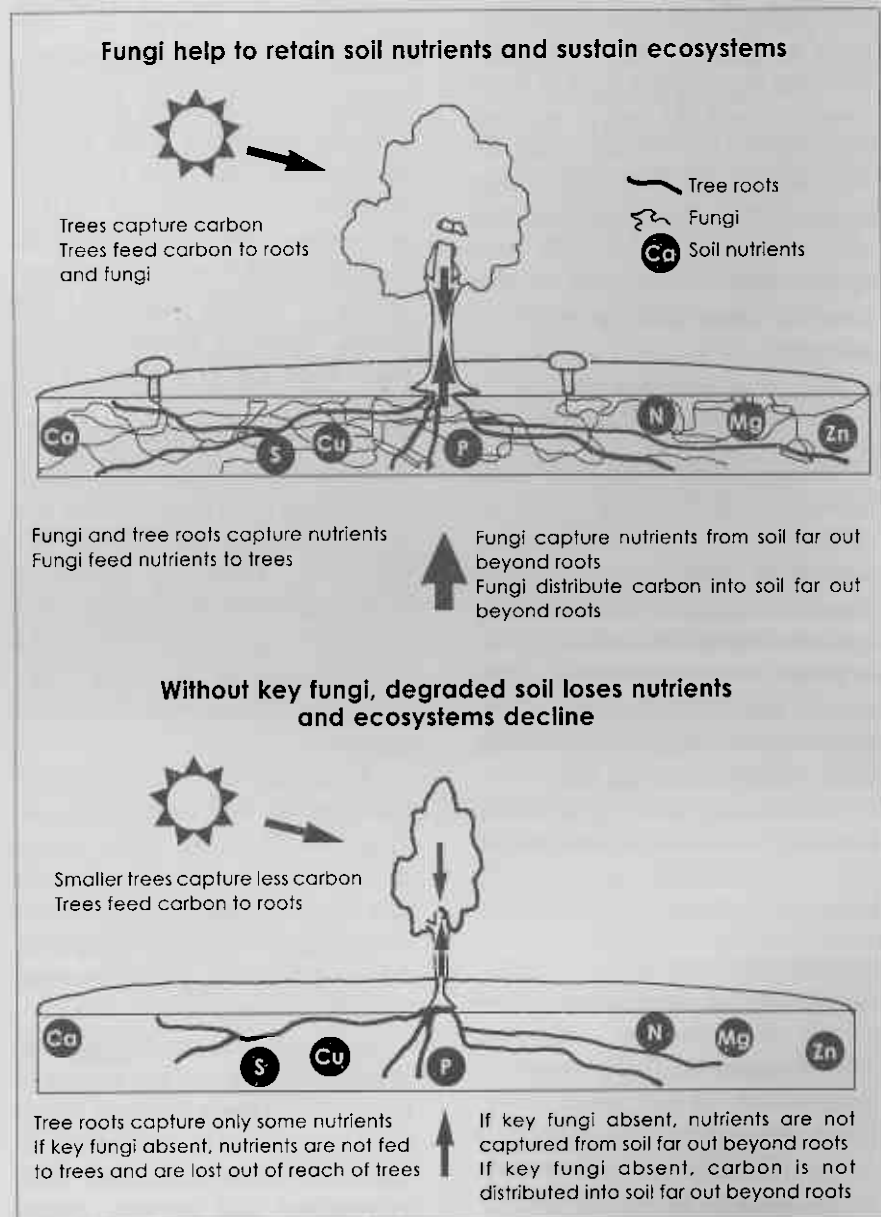
Fungi feed plants

Fine threads form symbiotic associations with living roots and act like an extra root system. Fungi

capture nutrients in the soil often distant from roots. Fungi transport nutrients to roots and make them available to the plants. In return, plants make sugars (carbohydrates) available to fungi. They help capture scarce nutrients like phosphorous and transport them to plants.

Fungi decompose woody litter and leaves to make soil organic matter

Without fungi we would be buried in litter. Fine fungal threads decompose woody material making nutrients available to plants and organic matter available to soil.



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Fungi bind soil particles
and
help soil structure

Fungi associated with roots and fungi decomposing litter bind soil particles and give soil structure. Fungi are very important contributors to coarse soil structure and soil organic matter. Fungi feed bacteria on the surfaces of the threads and the bacteria help to form fine soil structure.

Fungi capture nutrients from
soil and help prevent
leaching

Fungi form networks through soil deep in the profile near and distant from roots. The network throughout the soil captures nutrients, helping to prevent leaching.

Fungi are food for small
mammals

Fungi have high value as mineral nutrients and energy for small mammals like bandicoots and woylies. The rare and endangered potoroo on the south coast has mostly fungal fruitbodies as its diet. To re-establish animals like woylies in the Wheatbelt in the future, we need to re-establish their fungal food with the revegetation.

Fungi are food
for soil fauna

Fungi are eaten by myriads of small soil animals. These animals are important to soil organic matter and to the food web which feeds larger animals and birds.

Large trees and dense shrublands grow in infertile soils of the WA agricultural regions. How do the plants manage without fertiliser applications?

Fungi help the tight nutrient cycling processes, minimising nutrient losses and making captured nutrients available to plants and animals.

What happens if fungi are
not present in revegetation
soils?

Absence of fungi in revegetation soils puts the ecosystems at risk of

- (i) rundown in plant-available nutrients in the soil,
- (ii) loss of plant vigour,
- (iii) loss of soil quality, and
- (iv) inadequate food supply for some small mammals.

Inez Tommerup and Neale Boucher are doing experimental work in the Wheatbelt to study how best to put the appropriate fungi into revegetation areas. They can be contacted at CSIRO Forestry and Forest Products, CCMAR Lab., Perth. (08) 9333 6674.

**CHECK
OUT
YOUR
FUNGI!**



Bushland with lots of different fungi is healthy bushland – how many can YOU find in your patch?

Inez reports that even a moderate quality, heavily-grazed York gum remnant still has 50 species of fungi. But revegetated corridors, in a paddock next door, has only 5 Clearly, this could begin to explain the poor growth of some reveg.

Once you've found the fungi, a closeup photo should be OK for general identification. With toadstools, place one on its side so that underneath the cap can be seen in the pic.

NB: This makes a great school project!