

How you can help stop the spread of *Phytophthora*.

The best way to control *Phytophthora* is to prevent the transfer of infested soil or plant material.

- Avoid driving, riding or walking in areas when soils are wet and sticky.
- Stay on designated roads and tracks. Vehicles, bikes and people moving off roads into infested areas may pick up infested soil and transfer it to uninfested areas.
- Brush soil off vehicles, bikes, boots and camping gear before entering an uninfested area and after leaving an infested area. Do not take them home to clean.
- Obey road signs. Roads and tracks may be closed, sometimes permanently, to help stop the spread of *Phytophthora*.
- Use wash down or hygiene stations when provided.
- Protect your bush and your garden. Ensure that purchased plants are free of *Phytophthora*.
- Report any unusual plant death. Please report the death of groups of susceptible native plants to your local Department for Environment and Heritage office.



Please clean your footwear

Phytophthora is killing our plants!



Department
for Environment
and Heritage

For further information please contact:

Department for Environment and Heritage
Information Line - Telephone: (08) 8204 1910,
or see SA White Pages for your local

Department for Environment and Heritage office.

Online information available at:

www.environment.sa.gov.au/biodiversity/plantsand.html

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What is *Phytophthora*?

Phytophthora (pronounced fy-TOFF-thora) species are water moulds, fungus-like organisms, carried in soil and water that cause disease and death to a wide variety of native plant species, fruits, vegetables and garden plants. There are many species of *Phytophthora* found in South Australia. *Phytophthora cinnamomi*, which is also referred to as 'Pc', is the most common and destructive species.

Phytophthora attacks the roots and stems of susceptible plants and causes them to rot. The plants are no longer able to take up sufficient water and nutrients and die. The first visual symptoms of infection are discoloration (usually yellow or red) of the leaves followed by dieback of the entire plant. Depending on local site and environmental conditions, small shrubs may die within a few weeks and large shrubs and trees may take several years to die.

***Phytophthora cinnamomi* is considered a threat to over 1000 plant species worldwide. While it is still uncertain exactly how many species in Australia are threatened, it is expected to be in the hundreds.**

The best indicator species for the disease in South Australia are the Grass-trees *Xanthorrhoea* sp., as it is highly susceptible. Other susceptible species are *Banksia* sp., Myrtle Wattle *Acacia myrtifolia*, Cone-bush *Isopogon ceratophyllus*, Messmate Stringybark *Eucalyptus obliqua*, Brown Stringybark *Eucalyptus baxteri*, Mount Lofty Bush-pea *Pultenaea involucreta*, Pink Ground-berry *Acrotriche fasciculiflora* and many others. A group of dead or dying susceptible plant species is generally a good indication of a *Phytophthora* infestation.

Fruits (apples, pears, cherries, apricots, peaches, grapes, olives), nuts (macadamias, chestnuts and walnuts), vegetables (potatoes) and ornamental garden plants, such as lilies, camellias, hibiscuses and rhododendrons are known to be killed by *Phytophthora*.

Where is *Phytophthora* found in SA?

Phytophthora is native to South-East Asia and has probably reached Australia in a variety of ways. In Western Australia it is thought to have arrived around 1900 in orange trees imported from Indonesia, while in the Mount Lofty Ranges (SA) it may have arrived around 1970 in infested berries from nurseries in the Dandenong Ranges. On Kangaroo Island, *Phytophthora* has been noticed since 1993 and was most likely introduced through transfer of infested soil on vehicles or machinery from the mainland.

Phytophthora is able to grow in areas where average annual rainfall is greater than 400 mm (16 inches), and soils are acid to neutral. It has the ability to live in most of the southern areas of South Australia.

Phytophthora has been found in the Mount Lofty Ranges around Adelaide, the Fleurieu Peninsula, on Kangaroo Island and in the Lower South East. The presence of *Phytophthora* is suspected on Eyre Peninsula.

What does *Phytophthora* look like?

Phytophthora is minute and can only be viewed through a microscope. It grows in a thread-like fashion through the roots and trunks of infested plants. The only visible sign of its presence is sickness or death of the plants it attacks.

Phytophthora reproduces by spores (like minute seeds) or by mycelia (minute filaments). There are two common spore types. Zoospores are only present when there is considerable moisture in the soil. Another type of spore called a chlamydo-spore is long-lived. These spores can remain dormant for many years until conditions are right for growth (i.e. warm and moist conditions).

How does *Phytophthora* spread?

Phytophthora can spread from plant to plant through root contact. It is spread most rapidly when rainfall coincides with warm temperatures, generally in spring, summer and early autumn. The disease can spread very quickly with the help of 'artificial' factors such as human disturbance. The transport of infested soil and plant material by vehicles and heavy machinery (such as in fire fighting, logging and maintenance of roads and powerlines) is probably the most important factor in the spread of *Phytophthora*. A grader not cleaned after grading the road in an infested area can easily spread the disease to an uninfested site many kilometres away. Bushwalkers and bike riders can also spread *Phytophthora* by transferring infested soil on their boots and tyres.

For more information see the information sheet 'Phytophthora Bushwalking Guidelines' available from the Department for Environment and Heritage.

There is no cure for *Phytophthora*, nor is there a way of stopping its spread once it has infested an area. We can, however, slow down its spread, and minimise its introduction into new areas by modifying the way we behave in *Phytophthora* infested or *Phytophthora* prone areas.

Remember: the best way to control *Phytophthora* is to prevent the spread of infested soil or plant material.



Conebush affected by *Phytophthora*.