# How to sample for Phytophthora Dieback

This information sheet has been developed as a guide to help give you the best chances of recovering *Phytophthora* plant pathogens, if present, when sampling plants and plant material. The department strongly recommends that a registered Phytophthora Dieback Interpreter is engaged to provide advice, interpret, and sample suspect vegetation and landscapes if necessary to ensure best practice is maintained and if the dieback status of an area needs to be known. Otherwise, this information sheet may be used to guide you through the sampling process to achieve the most effective results. Please see the Vegetation Health costs and services before submitting the sample as a fee will be required.

In this document, advice is provided on the five main steps involved in effective sample taking; 1) choosing a sample site; 2) preparation and hygiene; 3) choosing what to sample; 4) taking a sample; and 5) sending in your sample.

## Step 1. Choosing the sample site

Target sample sites so as to gain the optimal chance of recovering a positive sample for an area, even when it is thought symptoms are from another cause. Positive sample results from a point of higher elevation provide more information in an infested landscape downslope, using this method is the most effective way of proving an infestation in a greater area, using this principle, every sample provides the best value information. Furthermore, target negative results lower in the landscape as this is where it is more likely to be infested. Although not a failsafe, a negative sample may confirm (with trained observation) that symptoms were caused by another disease or mechanism, the confidence in this determination increasing with practice, experience, and the knowledge that all steps were followed.

### Look for multiple deaths and a chronology or pattern

The ideal location for recovering Phytophthora Dieback is where (a) multiple susceptible species deaths have occurred, (b) deaths appear to follow drainage lines and (c) a chronology of deaths can be observed. Chronology means that a timeline of older deaths to recent deaths can be followed to a likely point of introduction (e.g. road).

### The disease front

Recently dead plants are the ideal choice for sampling. These will be nearer the disease front, where the disease is most active and inoculum levels are highest. New infestations are more likely to be found in roadside drainage. If vegetation appears healthy, then look for deaths in drainage and sample there. Recent deaths are not always easy to find within older infestations, so it's best to head upslope and away from the likely infestation starting point. For example, if your location is on a road with only old deaths observable, then head upslope. Look for the point at which vegetation increases in density and target plants in the area just before it.

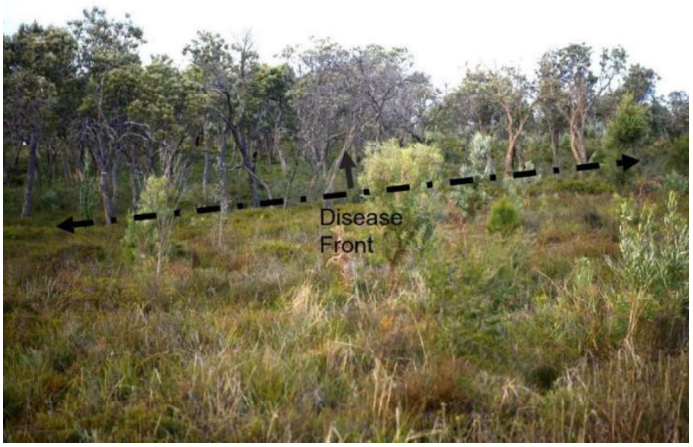


*Figure 1. Disease front moving through banksia woodland. Photo - DBCA*

**Ecosystem Health Branch**
Parks and Wildlife Service
Department of Biodiversity, Conservation and Attractions
PO Box 1693
BUNBURY Western Australia 6231

**dbca.wa.gov.au**
Phone: (08) 9725 4300
Information current in June 2024

## Step 2. Preparation and hygiene

Proper preparation for sampling to detect Phytophthora Dieback involves packing the right gear for taking, recording, and transporting your sample as well as being prepared to follow the basic hygiene protocols required.

### Sampling equipment

The following equipment will be needed for soil and root sampling for *Phytophthora* pathogens:

| Sampling equipment | Hygiene equipment | Recording equipment | Safety equipment |
|---|---|---|---|
| • Trowel, plus axe/ mattock | • Spray bottle of sanitiser | • DBCA Sample information sheet | • Gloves |
| • Plastic sample bag (tough) | • Stiff-bristled brush | • Clipboard and pen | • Safety glasses |
| • Bag tie (string or cable tie) | | • GPS or GPS capable device | • First Aid kit |
| • Bag label and marker | | | |

*Figure 2. Example of sampling equipment. Photo - Mark Spice/DBCA*

### Hygiene protocols

When accessing areas that may be infested with *Phytophthora* pathogens it is important to observe hygiene protocols, put in place by the department. Ensuring your boots, tools and vehicles are clean; (a) before entering a site; (b) after leaving your site; and (c) when moving from one site to another, will help to ensure you do not spread Phytophthora Dieback. Following Phytophthora Dieback hygiene also helps stop the spread of weeds or other pests and diseases during your sampling activities.

The department recommends using a brush to clean-down, removing all loose soil and clods of soil and plant material followed by a thorough spray of 70/30 Methylated spirits/water to sanitise the surfaces. Contain and carefully dispose of removed material.

Implementing appropriate hygiene protocols can take up valuable time but they are an essential part of your sampling strategy. Consider key risk reduction strategies such as: sampling in dry or moist soil conditions rather than wet; reducing the number of tools or vehicles used; and reducing the number of personnel involved. Any of these strategies will reduce your hygiene requirements and reduce your risk of spreading Phytophthora Dieback.

*Figure 3. Clean down of tools. Photo – DBCA*

## Step 3. Choosing what to sample

The aim of sampling soil and plant material to confirm the presence or absence of *Phytophthora* plant pathogens is to give yourself the greatest confidence in the accuracy of the result for your sampling efforts. As such, your sampling should target the roots of yellowing plants, plants which are just dying or have recently died, and are known *Phytophthora* hosts. The sample area should also be one where a *Phytophthora* pathogen is a possible cause of the symptoms observed. If you are not confident in your ability to produce a quality sample, you might consider engaging a Dieback Interpreter to conduct the sampling for you. Dieback Interpreter contact information can be found on the Dieback Interpretation page on the department's website www.dbca.wa.gov.au.

### Susceptible species

Make sure that some of the plants you sample are known hosts of *Phytophthora* pathogens. See examples of the departments indicator species lists (by Region). As a guide, plants within the same family will have differing levels of susceptibility and resistance to *Phytophthora*.

### Symptomatic plants

Choose plants that are actively dying rather than those that have already died and lost their leaves. Symptomatic plant leaves will be turning from green to yellow or orange. It is best to choose those plants where the whole plant is dying.

### Roots and soil

You are sampling to recover a root pathogen so ensure you focus your sampling on roots rather than soil. Take all of the roots of small plants. For larger plants, aim to dig at least 30cm deep (enough to reach moist soil) and ensure material is taken on all sides of the plant. Target fine roots mixed with soil but also collect finger-width roots. For larger roots you can cut away sections of the cambium (live outer root layer) on each side of the root. Target roots darkened by lesions (dark rotten patches) on the cambium. If sampling in sandy exposed soil in the peak of summer, it may be necessary to go up to 60cm deep for a good sample.

*Figure 4. Example of a recently dead Banksia species. Photo – DBCA.*

*Figure 5. Dark lesion on infected roots of Xanthorrhoea species. Photo – DBCA.*

*Figure 6. An ideal sample size. Photo – DBCA.*

## Step 4. Taking a sample

The procedure for sampling is as follows:

1. Ensure boots, tools and vehicles are clean before you start (see Hygiene protocols) and put on the Personal Protective Equipment (PPE) required for sampling.

2. Choose a symptomatic plant to sample (see What to sample) and clear sample site of leaf litter and obstructions.

3. Label your sample bag with a sample number or ID, use your sampling tool to collect your sample of root material and soil (see 'What to sample'), place inside the bag and tie the bag.

4. A single sample bag can contain samples from several plants of several different species within a 10m radius and should weigh approx. 1kg in total.

5. Use the Sample Information Sheet to record the GPS location of the sample, sample number or ID and the name/s of the species sampled. Clean your sampling tools between each sample and after sampling.

## Sending in your sample

Keep your sample safe from direct sunlight or extreme heat (between 10°C and 30°C is fine) until you can send it into the Vegetation Health Service (VHS). Do NOT refrigerate your sample, or pack with ice. Place in a suitable sturdy storage box or container with your completed Sample Information Sheet – your sample cannot be processed without it. Clearly label and post or deliver to the address provided below. Drop-off must be pre-arranged with the VHS, otherwise samples can be left with reception during usual business hours.

**Vegetation Health Service:**
**Address:** 17 Dick Perry Avenue, Kensington 6151
**Contact:** Juanita Ciampini – Senior Technical Officer
**Phone:** 0460 723 486
**Email:** vhs@dbca.wa.gov.au

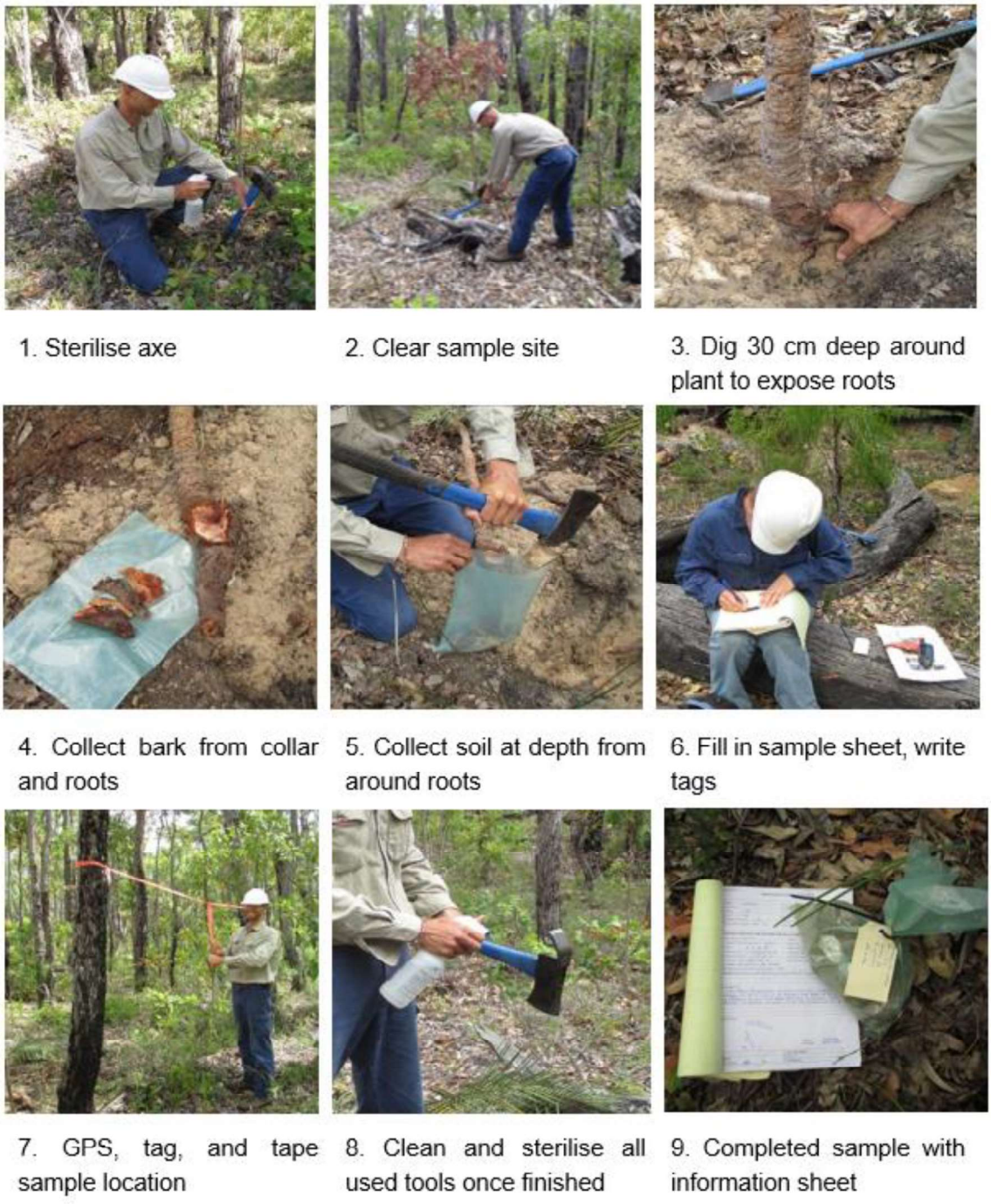


*Figure 7. Steps for taking a root and soil sample for Phytophthora pathogens. Photos – DBCA*

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