



Determine basic properties of soil and/or growing media

AHCSOL201A

By the end of this topic, you should be able to:

- Collect soil/media samples for testing
- Perform basic soil/media test

Types of soil/media

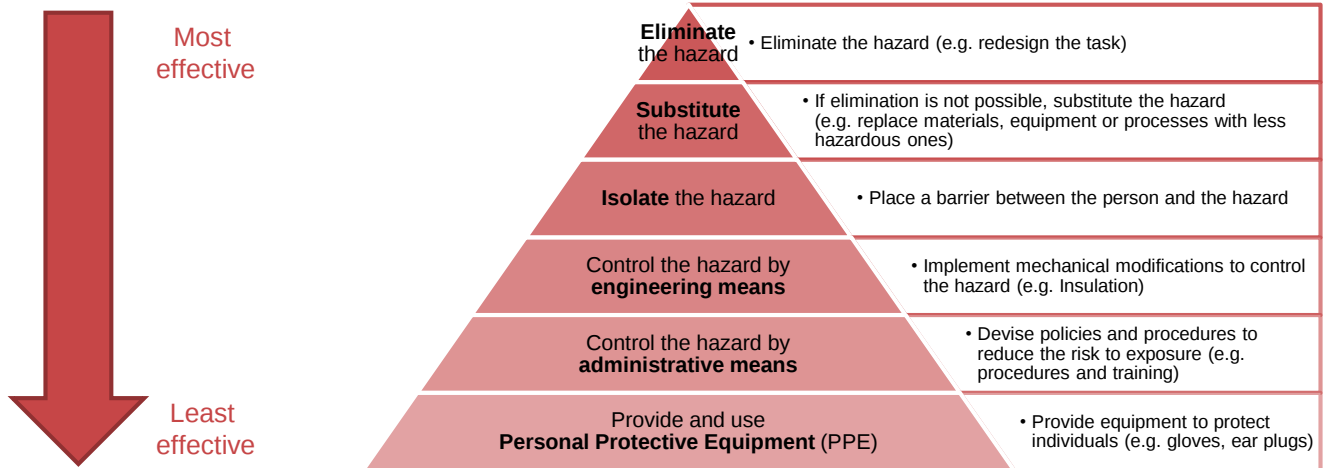
- There are a range of soil/media types:

Soil/Media	Definition
Clay soils	Heavy and difficult to work, but hold moisture and nutrients well. Prone to water logging. Holds together well and feels sticky. Neutral or slightly alkaline.
Loam-based compost	A less free-draining type of media, which is more prone to water-logging. Neutral or slightly alkaline.
Peat-based compost	Media which tends to be well-aerated and less prone to water-logging. Generally acidic.
Sandy soils	Drains easily, but dries quickly and nutrients are easily washed through the soil. Breaks up easily and has a gritty feel. Generally acidic.
Silty soils	Relatively light and rise to the soil surface. When dry, they can form a crust on the topsoil which may stop seedling emergence. Has a soapy or silky feel.

- To prepare for soil/media collection, you should familiarise yourself with the following:
 - **Task requirements**
 - Workplace records will identify the area from which soil/media samples are to be collected
 - Apply active listening when receiving instructions
 - Clarify any unclear instructions with your supervisor
 - **Workplace information**
 - Identify underground services for the site (e.g. from site plans, supervisor or contacting Dial Before You Dig)
 - **Work area**
 - Identify any WHS hazards and assess risks (e.g. underground services, manual handling injuries)
 - Report hazards to your supervisor within a timely fashion – especially emergency situations

Workplace risk control

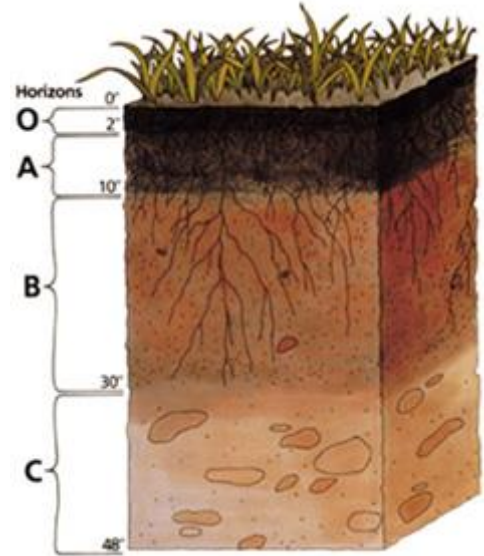
- The hierarchy of control gives priority to the order in which hazard and risk controls should be implemented.



- To prepare for soil/media collection, you should familiarise yourself with the following:
 - Available PPE, tools and equipment
 - PPE may include: Gloves, wide brimmed hat, work boots
 - Safety equipment may include: Barricades and signage
 - Tools and equipment may include: Soil auger, Soil core sampler, Shovel, Trowel
 - Ensure they are appropriately selected, prepared and used for the task, following manufacturer recommendations

Soil profile

- It is important to understand what exists beneath the surface when taking soil samples.
 - The vertical section of soil from the ground surface downwards to where the soil meets the underlying rock is known as the **soil profile**
- The horizons (labelled) represent the following:
 - **O**: Litter (i.e. dead plants and animal parts)
 - **A**: Top soil or mineral horizon
 - **B**: Chemical products of weathering accumulated in the soil
 - **C**: Parent material from which soil has formed



- When taking samples, you should complete the following:
 - Ensure that tools to be used are clean
 - Even a small amount of fertiliser residue on tools can contaminate a soil sample
 - Clear away any weeds and loose organic material to uncover the soil surface
 - Take multiple soil samples at each selected site
 - Ensure that samples are only collected in paper bags if they are lined with plastic
 - Take random samples from the designated area, according to recognised sampling techniques
 - Sample problem areas separately

Sampling techniques

- When taking samples, you should complete the following:
 - Ensure that an appropriate sample size is taken
 - Consider that less than a teaspoon of soil may be used for the laboratory analysis
 - Ensure the sampling depth is appropriate for the type of crop:

Sampling depth	Crop
5cm	Grasslands
15cm	Shallow rooted crops
22cm	Deep rooted crops
30, 60 and 90cm	Orchard crops

- Label the sample appropriately:
 - Include the date and location of sample (i.e. address, GPS coordinates), depth of sample
 - The soil sample will be assigned a number and entered into the laboratory register

Testing techniques

- The texture of soil can be tested by moistening a small amount and rolling it between your hands to try to make a 'sausage' shape.
- The pH of soil can be tested with an over-the-counter kit or meter.
- Salinity is tested in the following way using an EC 1:5 test:
 - Take a soil sample and leave it to dry
 - Crush the dried sample so there are no large clods of soil
 - Add soil to water in a testing container
 - Shake the container to make sure the salts dissolve
 - Allow the solution to settle and place the salinity meter in the solution (but not in the soil at the bottom of the container)
 - Read and record the display once it has stabilised
 - Convert the salinity meter readings to soil salinity (EC_e) by multiplying the value of the Conversion Factor (which is based on the texture of the soil sample)

- As part of completing testing activities, you are required to complete the following practices:
 - **Record and store test results**
 - Record your findings on appropriate paperwork, as provided by your organisation
 - Record your findings clearly, being mindful of people's varying backgrounds and abilities
 - **Maintain, clean and store tools and equipment according to manufacturer's specifications**
 - Report faults that are discovered
 - **Dispose of materials that cannot be reused or recycled**
 - Ensure that you follow the organisation's requirements for handling and disposing of waste

- Soil/media affects plants in a range of different ways:
 - If a soil has a hard B horizon, roots may have limited depth
 - Large changes in pH at a certain depth may restrict root growth
 - High salinity levels at depth will restrict root growth and/or performance
- The recorded results of soil/media tests may identify modifications that need to be made to the soil. For example:
 - Adding lime to reduce soil acidity
 - Changing drainage systems to reduce salinity