

Roots (pg 16)

Function

- ❖ (and its surrounding soil)
- ❖ Uptake of nutrients
 - Only at the – active and passive mechanisms
 - Roots grow
 -
 - Nutrient concentrations will (more root tips and increased nutrient uptake)
- ❖ Uptake of water
- ❖ Mechanism for
- ❖ Improve characteristics – promotes porosity

- ❖ Tap roots – (dicots only) – function is for – and also to access Minor role except to help compete against grasses
- ❖ Fibrous roots (esp. grasses) – In temperate pastures the with high fertilizer use – more typically 10 cm.
- ❖ Buried stolons and rhizomes –

Some key points

- ❖ Root mass under pasture can be greater than in any other plant system – many grasslands
- ❖ Typically – phalaris pastures in Australia can have a root:shoot ratio = 5
- ❖ Many of these roots are
- ❖ We can't easily separate live from dead roots. What is a dead root? – a) many roots have low metabolic activity and function simply as water channels, b) in times of desperation grasses can revive dead roots

Stress Effects

- Low fertility
- Grazing
- Water stress
- Water logging
- Root pests

Fertility

- Low fertility – root elongation rather than branching to
- Low fertility results in –surface area will increase by the square of the reduction in diameter
- Fertilizers are surface applied and promotes
- Low fertility of rangelands – they have higher root mass

Grazing

- Defoliation results in below-ground
- Good grazing management is associated with (fertilizer use) and typically results in i.e. more roots
- excessive grazing will root mass.

Water stress

- Generally decreases but increases ratio
- Rangelands tend to be drier – which contribute to

Water logging

- Roots obtain their oxygen from (not from any internal circulating system) and are
- Much water logging is local (surface flooding) and roots lower in the soil might not be flooded and can survive.

Root pests

- Fungi (root and collar rot), nematodes, grubs/larvae
- Earthworms don't eat roots
- Not all root consumption is necessarily bad – as livestock eat leaves with often positive effects,