



## Soil salinity

In groundwater discharge areas, shallow saline watertables occur within 1 to 2 metres of the soil surface. Capillary rise transports salts toward the surface which are then concentrated by evaporation. A crust of salt is often found on bare soil surfaces especially during spring and summer.

## Indicators of salinity

This includes visual symptoms such as die-back of mature trees; waterlogging caused by groundwater seepage; patchy crop and pasture establishment; reduced yields; legumes performing poorly or failing; loss of clover/medics; sea barley grass; bare areas; halophytes; salt crystals and white salt crusts.

## Climate and salinity

Unused rainfall is the source of groundwater recharge in dryland farming areas. In Mediterranean climates, most of the rain falls in winter when evaporation and plant water use is low. Excess water not stored in the soil profile will either runoff or end up as recharge to groundwater. Significant recharge occurs from large rainfall events and in wet seasons, and these events often result in a spread of salinity.

## High risk situations

Development of dryland salinity may be enhanced by barriers to groundwater and surface water flows in the landscape, which can be both natural or man-made. Examples of natural barriers include geological structures such as rock bars, faults and bedrock highs. Examples of man-made structures include roads and railway lines which hold back water if there are poorly functioning culverts.

Other landscape features that can lead to shallow watertables include constricted valleys, land-locked basins and low-lying depressions as well as leaky dams and drains.

## Waterlogging and salinity

Although salinity and waterlogging often occur at similar positions in the landscape with similar visual symptoms, they do have different causes, and treatments will therefore be different.

Waterlogging can be caused by heavy rainfall as experienced in wet winters and by poor soil drainage. Clayey soils and sand over shallow clay soils are most prone to waterlogging. A shallow perched watertable in sand over clay soils can also result in waterlogging if it seeps out at the surface in downslope areas.

Indicators of waterlogging include continuous wetness; presence of weeds such as rushes (*Juncus* spp); water buttons (*Cotula* spp); sea barley grass; patchy or stunted crop and pasture growth; yellowing or reddening of leaves and yellow or grey mottles in the soil profile.

Although waterlogging does not directly cause salinity, it can exacerbate the problem. It impedes plant growth and reduces water use which can increase the risk of groundwater recharge. Waterlogging reduces plant cover and decreases plant tolerance to salinity. If the soil then becomes bare, it is more vulnerable to capillary rise and salt accumulation in discharge areas. Potential acid sulfate soils may also be found in waterlogged areas.

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