

Management of some strongly duplex soils in SE Tasmania

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During detailed mapping of the soils of the University Farm it was noted that strongly duplex soils (0b2.43 and Dd4.43) with sandy topsoils and coarsely pedaled, dispersed clay subsoils were moist below a depth of approximately 50cm, 20-30cm below the abrupt, upper boundary of the subsoil. These soils are sodic and salinity increases with depth.

The University Farm includes soils that are representative of those occurring in the Coal River Valley from Cambridge and Sorell through Richmond and Campania and is sited in an area that could be irrigated in Stage 2 of a proposed South-Eastern Irrigation Scheme based on the planned Craighourne storage near Colebrook.

Soil mapping was done in January and February of 1981 after some years of drought. Crops and pastures had failed in the preceding season. Thus the fact that the soil material at relatively shallow depth was moist enough for field texturing was surprising.

This observation suggested that the moisture present was inaccessible to pasture and annual crop species. This inaccessibility could, in turn, be explained by high soil strength, high 15-bar moisture retention, or both.

The surface sands, loamy sands and sandy loams release water readily after light falls of rain but their storage capacity is low and crop and pasture survival depends on regular rainfall. The good results of the 1983 season were due to a fortunate repetition of light falls. The long drought continued in S-E Tasmania for the first seven months of 1984. Little more than 100mm of rainfall was recorded at Hobart Airport up to the end of July. A series of substantial falls brought the total to 110mm at the end of September. This rainfall was followed by the appearance of yellowed patches in cereal crops associated with waterlogging due to perching of water in the upper soil profile on lower slopes.

There are certain implications for management of these soils:

- For rainfed cropping the depth of a cultivation layer having favourable moisture storage properties might be increased by careful deep cultivation to mix the upper few centimetres of clay subsoil with the light topsoil.
- For more efficient irrigation it would seem reasonable to supply water in amounts sufficient to wet only the topsoil to the upper limit of available water storage capacity.
- Necessary drainage might be provided by a system of slotted plastic pipes (e.g. "garnite") laid on top of the clay subsoil, coupled with careful cultivation to avoid fouling the drains.
- A minimal cultivation regime should be suitable for topsoils of light field texture such as those with concomitantly reduced exposure to wind and water erosion (wind drift is common over these areas in summer and autumn).

These matters are the subject of continuing soil and agronomic research on the University Farm.