

Potential water use of phalaris, cocksfoot, lucerne and **birdsfoot** trefoil cultivars with varying seasonal growth patterns

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A study is being conducted to identify differences in the seasonal soil water use capacity of perennial pasture species and cultivars which have potential for groundwater recharge control in dryland salinity-affected areas of Victoria.

Methods

Field plots (7x7 m swards, 4 replicates) of phalaris (*Phalaris aquatica*, cv. Siroso and SIRO 1146, a *P. aquatica* x *P. arundinacea* hybrid), lucerne (*Medicago saliva*, cvv. Siriver and Cimmaron), cocksfoot (*Dactylis glomerata*, cvv. Kasbah, Currie, Porto and Kara). and birdsfoot trefoil (*Lotus corniculatus*, cv. Goldie) were sown on a red-brown earth soil at Tatura in April 1991. Changes in soil water content (SWC) under the various swards have been monitored to a depth of 2 m at 2-week intervals since November 1991 using a neutron probe method. Herbage samples (40x40 cm quadrats) have been taken every 4 weeks to monitor sward dry matter production and leaf area indices. The plots have been cut to 5 cm height approximately every 6 weeks.

Results and discussion

In the first year of the study, SWC was consistently lower under phalaris than under cocksfoot (Fig. 1), due to greater spring growth of phalaris in 1991 and the greater depth of moisture extraction by this species (120 cm, *c.f.* 90-100 cm by cocksfoot). Soil under the cocksfoot swards approached saturation in late winter. SWC under lucerne and birdsfoot trefoil was intermediate between that of the two grasses over the 1991-92 summer, when legume growth was most active, but was closer to that for cocksfoot by winter. SWC under the legumes decreased rapidly relative to the grasses in late spring 1992. From early January 1992 there were significant differences ($p < 0.05$) in SWC between cultivars of the same species. Generally the more summer-dormant cultivars had higher SWC. After heavy rainfall in January the profiles under the grassed plots wetted up more than the legume plots. By February/March the SWC under cocksfoot was generally higher than the other species and the differences between phalaris, lucerne and birdsfoot trefoil were generally insignificant. In this same period the SWC at 2 m depth was significantly lower ($p < 0.05$) under the lucerne plots, indicating that after 22 months lucerne was extracting water at a greater depth than the other species.

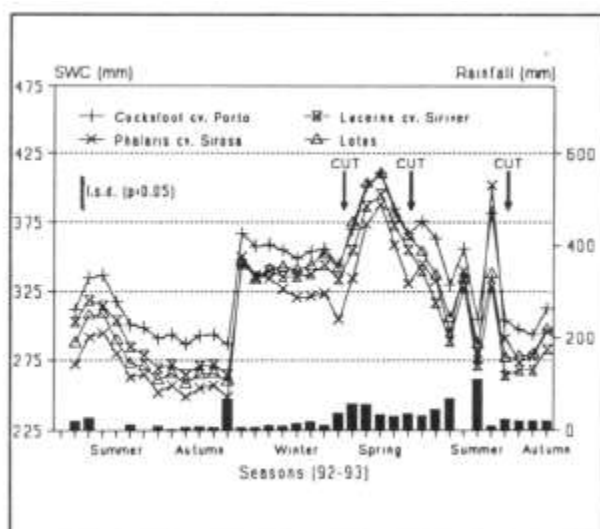


Figure 1. Change in soil water content under perennial pasture species (to 130cm depth) and incident rainfall. (One cultivar shown per species for clarity).