

The Available Water Holding Capacity of Soils Under Pasture

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The concept of available water holding capacity (AWHC) is important to many aspects of soil water management, particularly those involving a soil water balance. In New Zealand, AWHC estimates are commonly based directly or indirectly on laboratory measured pressure plate data. Such retentivity based values for AWHC are similar across a range of soil types. Less often, AWHC values have been measured under rye grass/white clover pasture in the field. We critically discuss some of the more important studies here. It is noted that field-measured values are commonly about twice the laboratory-based estimates. We conclude that variable rooting depth, due to the presence or absence of compacted soil at depth and/or variable pasture vigour or species composition, usually has a greater effect on the AWHC than does the soil properties in the top 760 mm depth. Finally, we demonstrate that this uncertainty around the exact size of AWHC need not undermine its utility. We also show that an important exemption to this assurance is where reliable predictions of drainage (and leaching) below the root zone are required: in this case there is the likelihood that use of the often quoted values for AWHC in the water balance will result in a significant overestimation of drainage (and leaching)