

# Profile Texture Classes: a New Data-Driven Functional Soil Classification for Southwestern Australia

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Soil information is critical for efficient and sustainable agricultural management. However, there is typically a hiatus between soil information which government agencies charged with supporting agriculture develop and deliver, and the information land managers can easily use for management in the paddock. This hiatus is largely due to (1) differences in the spatial scale of information needed by these different groups, and (2) communication-style inhibiting soil science information into management advice. We outline and evaluate a '*three factor functional soil classification*' based on soil texture, depth, and gravel content for south-western WA, referred to as Profile Texture Classes (PTC). PTCs are both a consistent inference of the profile data that can be applied to a wide variety of sampling styles, and a suitable starting point for soil classification where none exist. This approach demonstrates that a useful classification can be driven by code within databases; minimising the inconsistencies of individual interpretations that is inherent in soil classification. The PTC classification rules can be applied systematically to soil profile data, and can potentially be augmented to capture information about other important soil features. This simple classification emulates many of the criteria required for pedological soil classification systems such as the Australian Soil Classification or WA Soil Groups, and in some cases may be better at capturing features such as gravel layers that are important for land management. PTCs may help in bridging the science/management communication divide, as well as making a large number of lower quality soil observations (partial descriptions, no lab data) usable for digital soil mapping (DSM). Improving data availability for DSM leads to models that capture more realistic local scale soil distributions, which would be required for paddock-scale decision making. Comparison of profiles classified as PTCs with the best available soil mapping approaches suggests that PTCs, although very simplistic, maintain known geographic soil and soil property distribution patterns in southwest Western Australia.