REFEREED PAPER

A FRAMEWORK AND METHODS TO ASSESS IRRIGATION AND DRAINAGE DECISIONS

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Introduction

Farmers worldwide are facing increasing pressure to be better stewards of the soil and water resources they utilise. Often this requires an upgrade to an existing irrigation, drainage and/or water management system. Upgrades should be based on a good understanding of irrigation performance and the likely financial and environmental impacts of various choices.

Drainage problems are likely to develop insidiously over many years (Johnston, 1994). Also, because implications of poor drainage may not be immediately obvious and can be relatively difficult and expensive to address, many irrigation systems have been installed without effective surface and sub-surface drainage. As a result, substantial areas of irrigated lands become degraded over time. Thirty three per cent of irrigated land worldwide is reported to be degraded with salinity problems caused by poor drainage (Machado and Serralheiro, 2017).

The option to take advantage of substantial advances in surface and sub-surface drainage technologies should, therefore, receive serious attention in any consideration of an irrigation performance upgrade. GPS control of equipment has enabled land forming with continuously variable grades to be achieved relatively easily and cost effectively with minimal disturbance of the topsoil when compared to laser levelling, thus facilitating excellent surface drainage. Tile ploughs, also with GPS grade control, allow for precise and relatively easy and cost-effective installation of sub-surface drains.