

Soil Compaction and the Refill Point

Every Field is an Individual

Soil compaction is widespread throughout Australian agriculture affecting both the yield and quality of field and horticultural crops on all soil types. The level of soil compaction varies tremendously between individual fields on a farm and is a function of the trafficking history of a field and not the soil type.

In irrigation scheduling terms soil compaction dramatically affects the soil water deficit and daily water use rate of each field. Figure 1 shows the root extraction pattern and daily water use rate in mid season of two adjacent cotton fields with identical soil type. The more compacted field has a 60mm deficit and daily water use rate of 5.1mm compared with a 90mm deficit and daily water use rate of 5.9mm for the less compacted field.

Irrigation requirements can vary widely even on fields with the same soil type with the same crop. All fields are individuals and must be irrigated as such for maximum performance and water use efficiency of that field and farm.

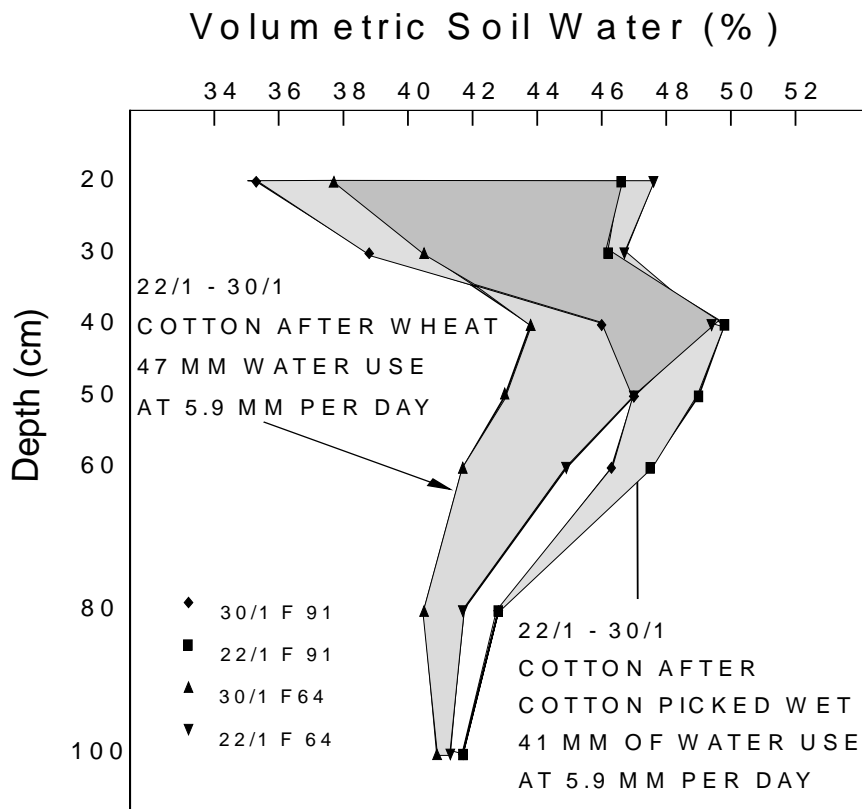


Figure 1. Water extraction pattern relative to field history.

Soil compaction affects the daily water use and the deficit all season long. The average daily water use of all the cotton after wet pick or compacted fields on a 9000 acre cotton farm are consistently 0.5 to 1mm less than the cotton after wheat rotation on less compacted fields. The result of a

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reduced daily water use, is a reduced total crop water use for the season and a correspondingly reduced yield. The yields on individual fields of a cotton farm at Narrabri ranged from 4.9 to 8.6 ba/ha in relation to the compaction level of each field as a result of previous trafficking history. Gross income varied from \$1960 to \$3440/ha at 400/bale of cotton.

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