Soil Management for Australian Irrigated Agriculture

SRP026

NPSI Case study

February 2011

Example of rye grass banks in an orchard

Situation

Subject: Chris Turnbull, Turnbull Brothers Orchards

Location: Goulburn Valley

Enterprise: Horticulture – Pome and Stone Fruit

Size: 120 ha orchards

Irrigation: 100% irrigated – mixture of sprinkler; drip; pipe; lasered flood

Trial success triggers changes on Goulburn Valley Pome and Stone Fruit farm

Link with NPSI

This case study is linked to the *Soil Management for Australian Irrigated Agriculture* project (SRP5026) being undertaken by Bruce Cockroft, Soils Research Pty Ltd.

This project addressed what was seen as the main cause for low productivity: "*Australian soils rapidly deteriorate when put under crops – they go hard, then restrict crop roots, yield falls off disastrously and the crops become uneconomic after two years. Soil hardening causes the low yields of most annual and perennial crops including horticulture; it also forces animal industries to grow pastures and graze in order to sustain feed production*". As a result, improving soils under irrigation was seen as a serious opportunity for increasing the value of Australian irrigated agriculture. Other benefits were highlighted such as improved water use efficiency, reduced costs, reversal of land degradation and marked increase carbon sequestration into the soil.

Soil improvement trials were undertaken on-farm as part of the project (4-5 x 30 m of rows). Supporting information was also received from the researcher from other trials undertaken in district.

Rye grass keeps the soil loose, soft and porous

"Banks improve penetration and drainage of irrigation water"

Changes made as a result of NPSI influence

Changes were triggered by the success of the trials – on-farm and elsewhere - and seeing a difference. It was noticeable that where they had no grass compared to grassed areas, the soils were harder with less infiltration of water.

There was a desire to see the rest of farm perform as well as the better soil areas. The experience of the researcher in improving soils was also an important factor in making the changes.

The changes made related to improving soil structure through:

- Heaping up/banking topsoil where new trees are to go to improve drainage
- Reducing herbicides that work against grasses
- Encouraging Rye grass (and other grasses) to grow along the banks/tree lines to improve organic matter/soul carbon in the soil, soil drainage and irrigation efficiency (quicker and more effective than traditional mulching and/or chicken manure etc.)
- *"We grow as much grass in winter as we can"*

"We grow as much grass in winter as we can"

There is an opportunity to take changes further by actively planting rye grass and apply earlier watering.

Costs of making changes

Costs include banking and managing grasses – but reduced cost of herbicides. Extra costs may be in the order of $100-200/ha – up to $250/ha with labour (approximation only). This is considered very low (not significant) compared to overall costs of production.

Benefits of making changes

Benefits observed and expected from the changes include:

- Improved soil quality - more roots on trees; improved water holding capacity; and better nutrient transfer;
- Improved penetration and drainage of irrigation water – improved water use efficiency; and
- Improved yields – aiming for 10% over the orchard (this is considered to be achievable).

Relevance to others

Although this case study relates to pome and stone fruits – it was considered that the principles and approach should be relevant across all orchards.

Further information

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