

Increasing the Resilience of Eastern Australia Irrigated Farm Businesses

QPI5161



NPSI Case study

February 2011



Situation

Subject: Irrigator and NPSI project co-operator

Location: Southern NSW

Enterprise: cropping business that is intensively managed

Size: 600ha

Irrigation: primarily 'bed and furrow irrigation'

Trialling retention of corn stubble as an inexpensive way to reduce soil water evaporation

Link with NPSI

This case study is associated with the Increasing the Resilience of Eastern Australia Irrigated Farm Businesses project managed by Daniel Rodriguez, QDEEDI, and funded by GRDC which aims to provide farmers with best-practice guidance on how to manage the impact of increased climate variability and decreased reliability in water supply by assessing agronomic and business options presented under a range of irrigated and dryland/rainfed enterprise possibilities. It includes farmer engagement to canvass whole farm management options regarding changed management options that are 'outside the norm'. This has been through both discussion focused groups and some on-farm experimentation to fine tune the inputs to management strategies that can be modelled to predict longer term effectiveness.

The irrigator concerned is located in southern NSW and has been particularly focused on maximising production and minimising water use in his cropping operation. He has done so through using technologies including laser levelling his paddocks, using high level GPS technology, etc. He then recognised that the one remaining innovation was 'to minimise surface evaporation' and he sought the cheapest and simplest way of doing so. In doing this he recognised the need to consider the extent to which he would lose soil nutrients and the trade-offs that might result.

To do this he decided to keep the corn stubble rather than burn it as previously. Then he investigated how to direct plant the wheat into the stubble using current machinery. After implementing this system and discovering that it was simpler than expected, he also found that a neighbour had tried a similar system with similar results.

“After focussing on maximising production and minimising water use through a range of technologies, I realised the only thing left was to ‘minimise surface evaporation’ – by retaining my corn stubble.”

His estimated savings of 1.5 megalitres/ha were then validated when Don Gaydon, CSIRO ran the data through the APSIM model which is a key element of the Increasing resilience project.

Changes made as a result of NPSI influence

The irrigator made these changes of his own accord and as a result of his own investigations. In Year 1 he implemented the system over 40ha then in Year 2 expanded it to 100ha. In Year 3 it was expanded to his full program. His actions were reported to Don Gaydon who sought to investigate the effects more fully for wider dissemination of the findings via the NPSI project.

The irrigator then became a co-operator in the NPSI project's data gathering, assessment and modelling project by reporting these proven on-ground practices. While he had made his own assessment of the water savings from use of these practices; the APSIM model demonstrated a very similar result, giving him confidence that his own assessment process was accurate.

This confirmed for him that these practices of stubble retention and direct planting into stubble had value as part of his normal management operations. However he is mindful that this is not a 'hard and fast rule' – it also depends on the planned cropping program, the weather and his other personal and property management influences.

He has now provided practical input to the NPSI project thinking about how to create soil water savings through retaining soil cover and direct planting into stubble. These insights will inform the thinking of other irrigators and growers on this issue; in context of their own personal cropping circumstances and management program, via the data contained in the expanded APSIM model.

Costs of making changes

The costs to the irrigator have been minimal. He was initially concerned that considerable change would be required to his planting machinery – however this proved to be unnecessary. He has also noted improved soil condition which is a bonus side benefit to the estimated water savings of 1.5 megalitres/ha.

His only concern remains 'whether there will be some form of loss of soil nutrients. This is unknown at present and he is 'happy with the trade-off'.

Benefits / Impacts of making the changes

The real impacts of this work have been on the irrigators own enterprise in terms of increased soil water retention and improved soil condition.

However now that this information has been added to the APSIM modelling, the experience and advantages can be conveyed to a range of growers, irrigators and advisers via the APSIM model as an information source.

Relevance to others

The irrigator believes this is a highly relevant addition to the management strategies of other irrigators in similar circumstances, although he notes 'this is a personal decision for other irrigators and growers based on their individual cropping regimes'.

He reports 'the real relevance to other growers will be that their water goes further and that they can think about how best to apply these findings to their own circumstances; as an alternative management option to burning stubble (under most circumstances)'.

(Please note that this case study is anecdotal in nature and based on reporting key concepts rather than full details)

Further information

NPSI

Guy Roth
Program Coordinator
Phone: 0417 223 179

Tony Clancy
Media Coordinator
Phone: 0418 445 492

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www.npsi.gov.au