

Root Zone Water, Salinity & Nutrient Management Under Precision Irrigation Project

SRD8



NPSI Case study

February 2011



Situation

Subject: Brian Caddy

Location: Riverland of SA

Enterprise: vineyard run according to organic farming principles

Irrigation: well targeted drip irrigation

How to retain fertilisers in the 30cm soil zone in vineyard settings

Link with NPSI

Brian Caddy was involved on the project steering committee of the Root Zone Water, Salinity and Nutrient Management Under Precision Irrigation Project managed by Dr Tapas Biswas and Dr Gerrit Schrale which focused on changing awareness of what good water and salt management involves. The aim was for local irrigators and the community to better understand the need to actively monitor and manage root-zone salinity, in addition to achieving high water use efficiency. The particular focus is on avoiding salinity build up at the rootzone at times of limited water availability.

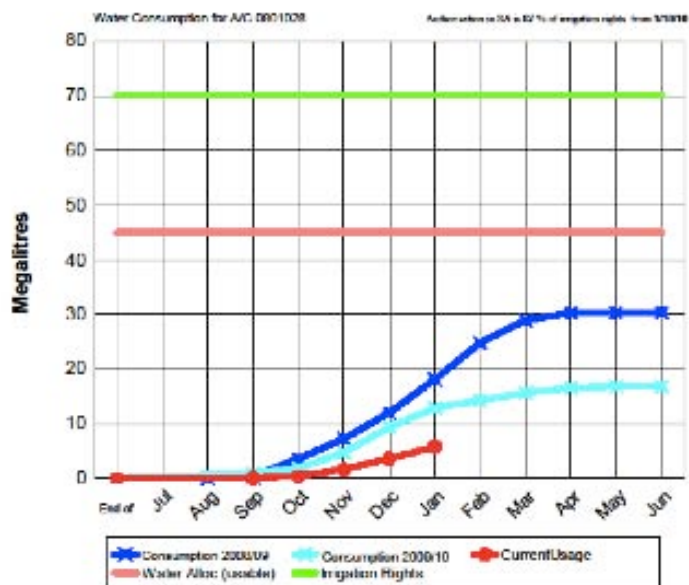
The project has provided tools and techniques, including the SoluSAMPLER™ soil water salinity monitoring tool, to enable irrigators to easily monitor and manage salinity throughout most of the growing season. This new technique of irrigated crop salinity management is expected to become most useful to the lower Murray Basin growers in approaching years when the river water salinity can be expected to spike drastically as flood waters change the dynamics of soil salinity mobilisation after recent drought years. An important element of this is to ensure new thinking by water regulators that will assist irrigators in implementing better management of salinity.

Brian also trialed an early previous version of the SoluSAMPLER™ soil water salinity monitoring tool using NPSI funds to provide practical perspectives to aid development of such relevant tools for growers.



Available for use including trade	41,037 ML	Water	270 x 1.1	297 ML	270 x 1.1	297 ML
Consumption 100%	9,989 ML	Water	270 x 1.1	297 ML	270 x 1.1	297 ML
Usable Water - Total	45,605 ML	Water	270 x 1.1	297 ML	270 x 1.1	297 ML
Your In this year	5,766 ML	Water	270 x 1.1	297 ML	270 x 1.1	297 ML
Remaining (at this time)	39,839 ML	Water	270 x 1.1	297 ML	270 x 1.1	297 ML

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This CIT graph demonstrates Brian's declining water use as he improves his irrigation management.

"The value of retaining fertilisers in the 30cm soil zone includes maximising plant uptake of soil nutrients and minimising environmental impacts."

Changes made as a result of NPSI influence

As a result of his involvement in the NPSI program Brian has increased his knowledge about water, soil management, salinity and soil nutrients. Historically he has been a strong record keeper and is now far more informed about these issues. He can also support the thinking of others due to these comprehensive records – scientists, growers and water managers.

This has supported him in changing his own management – and supported him in his discussions with key decision makers – as he seeks to advise them on altered water management strategies.

Costs of making changes

Brian has incurred cost in previous years to trial a range of techniques. In a previous round of NPSI he was one of range of grower co-operators who were provided with funds to install soil monitoring devices. This assisted with the development of current technologies that emerged from the NPSI funded project.

Benefits of making changes

As a result of his increased understanding of soil salinity and water management and movement including the concept of fertigation, his goal is now to retain fertilisers in the 30cm soil zone. This is his preferred level in order to maximise plant uptake of fertilisers and assure him of most cost-effective usage of soil nutrients. It is also to minimise the environmental impacts of fertiliser applications.

Impacts of making changes

Brian considers it is crucial to record salt and water levels in the soil. This allows him to be sure of the level and amount of fertiliser in particular in the soil profile so he can assess its effectiveness and overall impact (on the plant and environment).

His water use in the vineyard to 30 January 2011, halfway through the season, is now less than 1 megalitre per hectare (it averaged 3.6 megalitre per hectare during the drought) and he can manage his enterprise in the more organic manner he seeks by using certain trace elements to unlock key soil nutrients and to reduce overall water use.

His engagement in NPSI work and other R&D programs has also made him open to the possibilities of minimising water use through adoption of new technologies including drip irrigation and also how to maximise use of soil microbes to maximum effect. This has in part come from the interaction with researchers, innovative growers and water managers who have collectively influenced his thinking on a range of key issues.



Brian Caddy is a strong advocate of using targeted drip irrigation to help focus his use of fertilisers and unlock key soil nutrients while reducing overall water use.

“My interaction with researchers has opened my eyes to possibilities of new technologies.”

Relevance to others

The information to emerge out of this project has high relevance to other growers – from the perspective of better salinity management overall, access in particular to the Leaching Calculator that emerged from related work and the SoluSAMPLER™ soil water salinity monitoring tool. This means they have better appreciation of key concepts and can better measure key indicators.

Brian is however concerned about the amount of time it takes research agencies to release new tools that can benefit growers.

He would like to see growers accessing these tools as quickly as possible. He would also like to see publications created, particularly fact sheets, that can help those managing wineries to minimise salt issues associated with grapes. Other forms of information distribution such as workshops, conferences, etc are also important to ensure what is learned can be disseminated to those who need it.

Further information

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