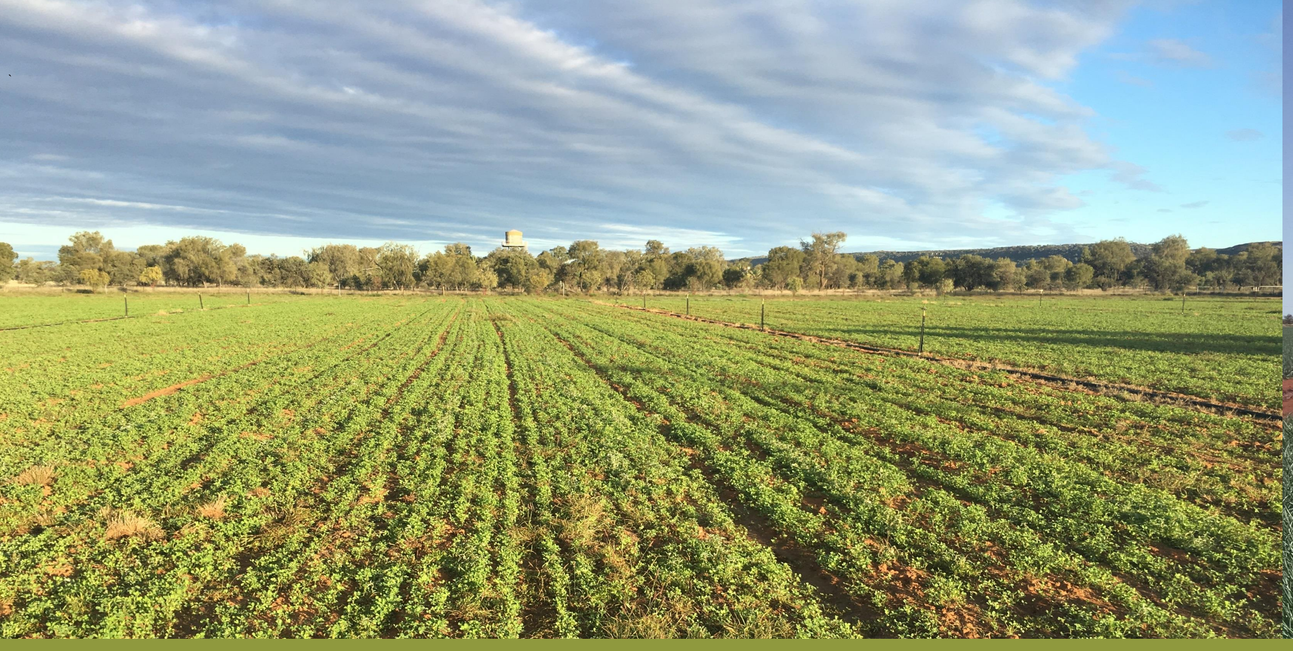

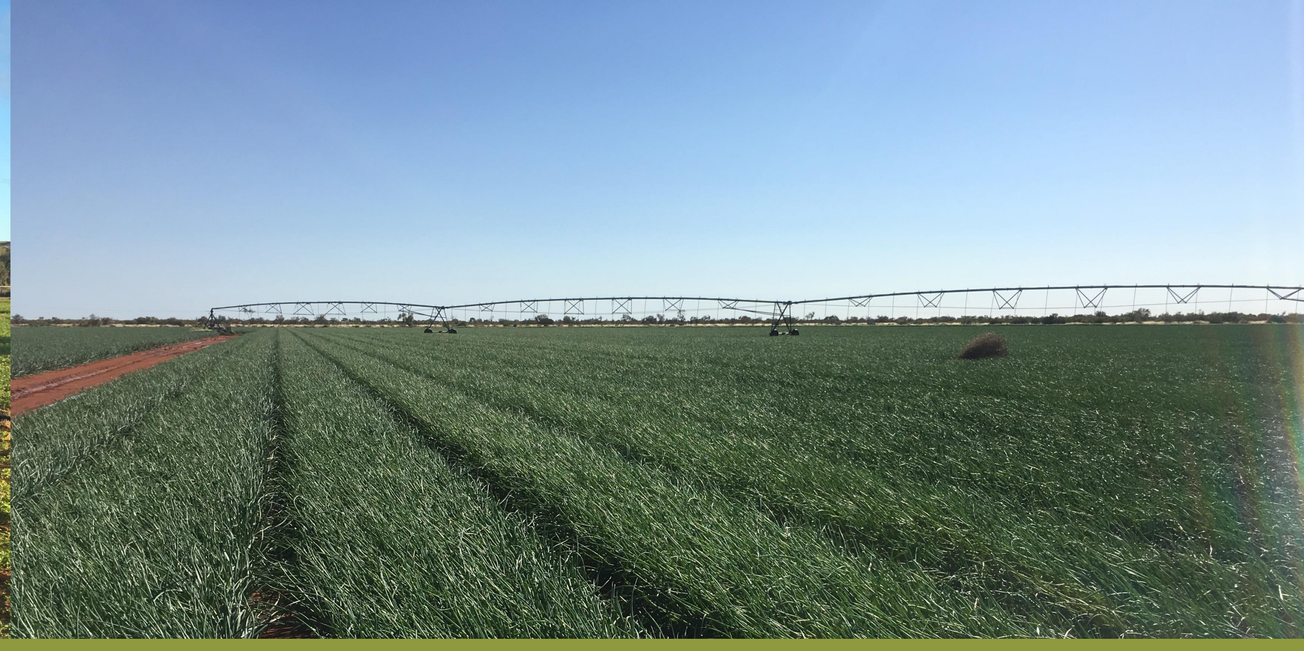

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Water with quality constraints: **Can you still sustain plant industries in Central Australia?**

Introduction

In spite of sometimes marginal water quality, plant industries are continuing to operate in Central Australia. Existing industries include table grapes, vegetables, fodder, dates, melons, bush foods and medicinal plants.

Water quality

The main water quality parameter that limits crop production in Central Australia is salinity. Salinity is a measure of dissolved salts in water. Salinity is commonly measured as a concentration of total dissolved solids, expressed as milligrams per litre (mg/L) or parts per million (ppm). For drinking and irrigation water, it is preferred that total dissolved solids are less than 1000 ppm. Rain water is less than 10 ppm, river water is usually less than 100 ppm in humid areas, while groundwater in Central Australia can be up to 10000 ppm.

In the three water control districts that currently have commercial plant industry activity (Alice Springs, Ti Tree and Western Davenport) there are substantial areas of good quality soils that overlie commercial sized deposits of water with total dissolved solids between 500 – 1000 ppm. These water sources are currently used for horticulture and fodder production. There will be significant constraints on future development unless water of medium to high salinity can be used. However, in the medium term, there is scope for substantial expansion of plant industries in Central Australia using existing high quality water supplies.

Policy implications

Where possible, high quality water for irrigation should be used in a way that:

- Maximises public and private benefit
- Is used on crops that have a preference for higher quality water
- Minimises wastage while maximising economic yield.

Poorer quality water should be used for lower value and / or tolerant crops.

Research should be conducted to determine the tolerance of economic crops to different water salinities.

Crop tolerance

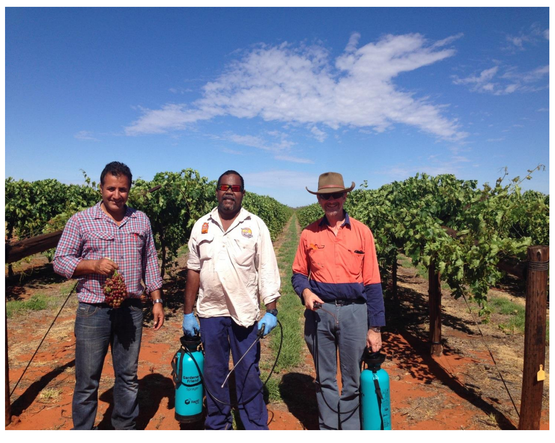
Crops vary in their tolerance of salinity. Salinity tolerance is due to three main mechanisms – osmotic stress tolerance, exclusion of uptake of sodium and chlorine or tolerance of plant tissues to accumulated sodium and chlorine. Crops such as persimmons, kiwi fruit and avocadoes do not tolerate high levels of salinity. Even if early growth is good, salts will build up in tissues, eventually causing death. These crops should be grown with the best quality water available. The following table shows the tolerance of various crops to salinity. These crops have potential in Central Australia.

Intolerant	Moderate tolerance	High tolerance
Kiwi Fruit	Almond	Barley
Avocado	Apricot	Beets
Persimmon	Cabbage	Zucchini
Onion	Eggplant	Dates
Strawberry	Table Grape	Asparagus
Sweet corn	Melon	
Garlic	Sweet Potato	

Avocados are salt intolerant, but new rootstocks may improve their tolerance levels.

Garlic trials at the Arid Zone Research Institute have shown symptoms of salt stress from water with total dissolved solids ~ 2000 ppm.

Melons are moderately tolerant of salinity, and thrive on high quality water and red sand at Ali Curung.



Grapes are tolerant of the moderate to good quality water at Ti Tree. There is potential to expand this industry using good quality water in the area.