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Plant genetics the answer to using salty groundwater

Brad Stillard, 2010 Nuffield Scholar Profile

While many broadacre farmers deal with the problems of salinity, it's also the curse of NSW tomato grower Brad Stillard.

So much so that he applied for a Nuffield Scholarship to try and solve the problems salinity was posing.

“We currently grow tomatoes with saline groundwater and I was interested in finding out what I would do if that salinity increased and how I could manage to keep ourselves productive.”

Brad grows tomatoes on his Barooga property with groundwater which has a salinity level of 4.2 dSm, which he says is close to the limit commercial tomatoes will tolerate, so any increase would require an in-depth understanding of salinity and how to manage it successfully.

The good news for Brad was that there are good examples of saline water management around the world – it was just a matter of jumping on the plane and starting his Nuffield journey.

“I tackled it by going to areas that have been dealing with saline water for a long time – most of the Middle East have been dealing with salinity for decades and so I went to those sort of places looking for some answers to see how they handle it.”

Brad says he decided to not just limit his research to tomato crops, believing there could be plenty of lessons learnt in how other crops are managed in saline conditions.

Interestingly, much of Brad's findings centred on the importance of genetics.

“Most of the key things that I've found is that genetics, or salt tolerance, is extremely important – it's probably 60 per cent of the total of growing a crop, and 40 per cent would be the farmer.

So if you've got good genetics, you've good plants in place, good salt tolerance, it makes it a lot easier to deal with salinity.”

Brad says he also studied soil conservation practices, with a view to assessing how much of an impact his current production system is having on his soils.

“I investigated just how much of an effect on the soil and soil health I'm having, how much destruction or devastation I'm putting out there and the preliminary research that I've done on

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my own property is that I'm actually not degrading my soil as much as I thought I did, so if I got anything out of this, it was that perhaps some of my current practices are actually heading in the right direction, but it's just a matter of improving them."

While the main thrust of Brad's research was the importance of having the right genetics when growing crops in salty water, there's also the other end of the problem to consider too – the salty water itself.

However, the primary consideration for most farmers is the back pocket, and so searching for a solution to desalinate his groundwater proved unviable.

"I purposely didn't look at reverse osmosis, which is basically filtering out all the salt, because in my business I would examine the cheapest option first and the cheapest option first will be to just modify my current practices.

So I kept my focus on management so that if someone reads it, they could then go out and do something with my report findings.

Down the track if that problem graduates on to be a bigger problem, then perhaps I will have to consider reverse osmosis or another solution."

Having completed his Nuffield report, the challenge for Brad of course is to put into practice some of his new knowledge.

He says the way forward may not be necessarily in the laboratory but perhaps by simply searching for crops naturally suited to salty water.

"Well it's funny because I'd actually found some canola varieties that have been grown in Australia, and they're not promoted as being salt tolerant and yet I have seen them in trials demonstrating good salt tolerance.

So I actually wonder just how many varieties of crops that we're growing out there that are actually quite salt tolerant, and if we can just identify them and modify some of our management, they could perhaps open up some land and different water use."

Nuffield Australia is an organisation which provides opportunities to Australian farmers between the ages of 28 and 40 to travel the globe investigating a research topic important to them and Australian agriculture.

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To read Brad's report, please head to

www.nuffieldinternational.org/rep_pdf/1310104444BradStillardfinalreport.pdf

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