



## Kira - Revealing the mysteries of the Ruby saltbush

### What was your goal?

I wanted to learn more about the plant Ruby saltbush. I've been growing it at home for years but I didn't know much about it and when I tried to research I found there wasn't very much information. I came across a study done with bush tomatoes and I thought if I could replicate the study but with Ruby saltbush I could find out how drought tolerant they are.

### Why did you pick Ruby saltbush?

I grow them at my house and it was very, very big and I used to love picking the berries when I was younger but I also saw them around salt lakes and places where it was very, very dry and nothing else grew and I wanted to know just how salt tolerant they are. It's amazing that they can survive in such a barren place where nothing else can.

### How did you start your research?

The research started out with just looking at where I could find seeds. I got seeds from the Banrock Wetlands and then I experimented with growing and germinating the seeds. That went into me looking at and trying to find out how to germinate the seeds which is very easy, they don't need any special treatment, although they won't grow if you just put the seed straight into the

ground - they have to be dried first, so you just dry the seed and then plant it.

I wanted to do an experiment on drought tolerance and they do take a little while to grow so I actually went and dug up plants from the wetland rather than using the ones that germinated myself otherwise they would have died and they wouldn't have been big enough.

### How did you test drought tolerance?

Each week I had 10 pots and five of them were for drought tolerance and five for salt tolerance. The drought tolerance ones I would water so I'd get water and a watering can and a measuring cylinder attached to the pot and pour so it averaged to about 5ml over the whole surface area and I put 5ml in one pot, 10ml, 15mL and 30mL in others.

And in the other pots I stirred dissolved salt into 15, 20, 25 millilitres of water and then I poured that onto the pot so they'd get those dosages of water weekly and it was the same through the whole experiment except halfway through I gave them all fertiliser which on the graph you can see a big spike after that in foliage, and then they just died down again but it's amazing they went from like basically dead to completely green.

## Why did you add fertiliser?

I'm doing it since for the experiment the pot wasn't in the ground or a natural environment where there would have been insects, other leaf litter, maybe dead birds or some other stuff falling onto it and also salts and stuff coming up from underground. It was in a pot so it was a very contained environment and I didn't want them to die, so I'd rather just give them fertiliser.

## Who did you work with?

My environmental science teacher helped me quite a lot. They helped me set up the experiment. We got the seed plants in the first place; after that I pretty much ran it myself but I did get help from the school gardeners and caretakers, they let me in during the holidays when I had to come back to school and water my plants.

## How long did your project run?

10 weeks. So each week I'd come in and it would take about an hour and a half to finish watering them all and measuring the other plants.

## How did you measure the plants?

I measured their growth with foliage percentage, an old trick you do with assessing the tree health of a tree, so I used that theory on plants and you just have a small area and see how much of the foliage is dead. You look at that and work out the percentage. I looked at the average growth, so how tall they grew and I looked at the appearance of fruit - how many fruits they had, so how many berries they produced over time.

## What were your overall results?

Although all the plants suffered, they did all survive, which is basically the main thing. I expected the ones I was giving below the average rainfall in Denmark - which I was giving 5ml per week - I expected those ones to die, but they did survive which is great and means they are very, very tolerant to drought, and salt as well.

## If you did the project again, would you change anything?

If I did do it again I would try to germinate my own plants because that is a variable that needs to be eliminated because I don't know how old all the plants are, so there could be ten years between two of the plants I used and that it's not the greatest data. If I was going to do it again I would grow the plants beforehand and grow them to an age where they're all the same before starting.

## Did you share your results?

Well this time, I used to it for my major for Environmental science which is a Yr 12 subject and then I'm thinking of next year and turning it into the Oliphant Science Awards and also sharing it with the Environment Group.

## Biggest success?

The fact that all the plants survived. I didn't really want to see any of them die. Honestly, I would have felt really guilty but they're all alive and they're going home where they'll get watered regularly.

## Next steps?

The project's finished, although I might repeat it with plants that are all at the same age.

## What plant would you research next?

I would like to try the bush tomato, I'm not sure of the botanical name. I know it's very difficult to germinate and you have to do something special, and there are different methods. I'd like to try experimenting with the germination as they're hardy Australian plants.

## Your advice to other students?

Just that before you do it it's very time consuming and can be a little bit tedious, so just make sure you know what you're getting into. Do you really want to commit basically two hours of your week, can you keep coming at that time every single week because you can't miss a week otherwise there's a hole in your data. But also it's a good experiment to do, just be aware of what it is, you might want to try it with a different plant.

## Did you learn anything about yourself?

I think I learned that although I love science I'm probably not going to be doing experiments like this for my entire life. How can I be doing research science for my career - definitely not, I don't have enough patience. I'd prefer field science, actually being outside while doing it, not just in a glass house recording results.

## What was most enjoyable?

I've enjoyed watching the plants just fluctuating over the time and then they've produced berries and it's been fun to watch and then the best part I thought was taking them home at the end and seeing them, just watering them and the next day they have so much growth on them, it's amazing.

*This case study was transcribed from an interview. These are Kira's words and opinions.*

