

Introduction

What is wheel cactus?



- Wheel cactus (*Opuntia robusta*) is believed to have been introduced to Australia from Mexico to be used as a hardy garden plant.
- It can grow up to 3 metres tall, and each plant can produce many fruits each containing around 500 seeds.

Why is it a problem?

- Wheel cactus is a major problem in some areas since it grows and spreads extremely fast, taking over valuable farmland and native environments.
- The fruits are also highly addictive to certain animals making some animals starve to death because they will only eat wheel cactus fruit.
- Wheel Cactus is highly invasive because it grows from seed and any parts of the plant that fall on the ground.
- It also spreads far and wide due to animals like crows and foxes eating the fruits.

Aim of the project:

- The aim of the project is to figure out a more economical amount of glyphosate than what's currently being used to control wheel cactus for injecting into the wheel cactus.
- This will also help reduce the possible impact of glyphosate on the environment, and make it a much cheaper process.

Method:

Division of plots:

- Areas of wheel cactus plants were divided into separate plots, which were approximately 3m x 3m in size. Each plot contained approximately the same number and similar sized plants.
- Plots were marked out using orange tape and pegs and labeled with a sign showing the concentration of glyphosate used.



Treatment of wheel cactus plants:

- Each cactus was treated with a mixture of water and glyphosate, which was injected directly into the lobes of the plants with a special cactus injection kit.
- Each different plot was injected with a different concentration of herbicide.
- The original concentration of glyphosate was 450g/L
- This glyphosate was diluted with water to the following dilutions:
 - 0%, 5%, 10%, 15%, 20%, 25%, 33.3%, and negative control.
- Each lobe of the wheel cactus plants was injected with approximately 4ml of diluted Glyphosate.
- The dilution 33.3% was used because this is the normal dilution used by the Tarrangower Cactus Control Group Inc.
- The lesser dilutions were used to test if a weaker dilution would be just as effective and could be used instead so that less herbicide is required and used.

Injecting Equipment:

- Injection Kits consisted of a backpack containing the diluted herbicide connected to a trigger gun with a very long spear (needle) The long needle was inserted into a Wheel Cactus plant lobe and then pulled partially out again to create an empty space to hold the liquid herbicide.
- Then the trigger was squeezed and 4 ml of diluted herbicide was squirted into the air pocket in the lobe.
- Then the needle was pulled out of the lobe.
- This was repeated for each lobe of each plant.



Safety and Protection:

- Each person was required to wear long sleeves and pants and covered shoes, and were provided with the following personal protective gear:
 - Gloves, Eye goggles, Yellow vest.
- A wash station with water and soap and towel was provided in case any herbicide came in contact with skin.
- A First Aid Kit with an eye wash and tweezers was also available.

Results:

The wheel cactus plants were injected with different concentrations of glyphosate, The plants were left for 6 months and then inspected for effects from the glyphosate and photographed.

The following effects were observed for each concentration of glyphosate:

0%



0% Glyphosate concentration **Before** Injection



0% Glyphosate concentration **6 Months After** Injection

5%



Before



After

10%



Before



After

15%



Before



After

20%



Before



After

25%



Before



After

33.3%



Before



After

Discussion:

Variables which could influence the results:

- The operators (people injecting the plants) were inexperienced.
- A different operator was used to inject each plot.
- Each person might inject slightly differently or might inject different amounts of chemical into each lobe.
- Each plot has a slightly different amount of wheel cactus plants in it.

Conclusions:

- All concentrations other than the 0% concentration had some effect on the wheel cactus plants after 6 months.
- All of the plots other than the 25% and 33.3% glyphosate still had small green patches on the leaves after 6 months which will probably continue to grow into a new plant.
- None of the green patches on the leaves grew back even after a year of sitting on the ground, however this will probably happen within a few years.
- Some of the smaller cactus plants didn't die when using the lower concentrations, probably because of inexperienced and different operators.
- I recommend using 25% glyphosate because the lower concentrations have a the possibility of growing back.

Significant reduction in use of chemical:

- $\frac{1}{4}$ concentration compared to a $\frac{1}{3}$ concentration is a huge amount of difference and will save a huge amount of money on glyphosate.
- If Glyphosate has any impact on the environment the reduction in the amount used will be of huge benefit.

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<https://cactuswarriors.org/wheel-cactus/>

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