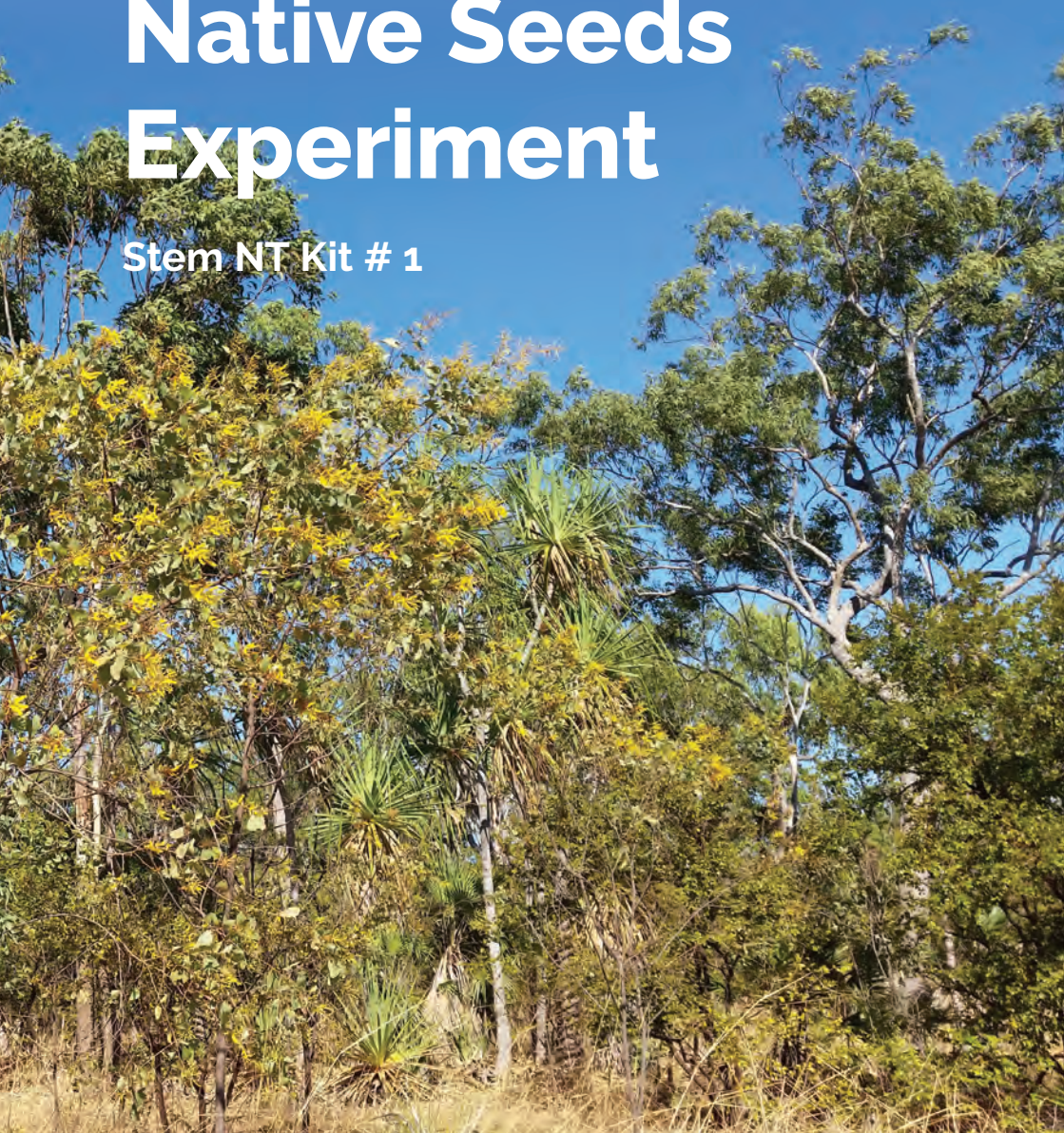


# Native Seeds Experiment

Stem NT Kit # 1



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## Native Seeds Experiment

### Welcome to wonderful world of the Top End seeds!

Plants are adapted to the environment that they live in, and they have evolved seeds that are able to germinate at the right time of the year. To understand about our plants seeds we first need to understand our environment. The weather in northern Australia is tropical, with monsoons in the wet season and very few rains in the dry season. Temperatures do not change much during the year, with average maximum temperatures in the Darwin Region over 30°C. The wet season is warm and humid. Most of rain falls from November to March. This is the season when plants grow – taking advantage of the rain and the warmth. During the wet season, plants are lush and green, canopies are full, and fleshy fruits are ripening. Animals are feeding and mating – the calls of frogs and cicadas can be heard. The dry season lasts around 7 months, from May until October. The dry season has cool dry winds blowing in from the south east. During the dry season, many trees lose their leaves, and fires burn much of the country.

Savanna woodland covers most of the Top End. The tree cover in Top End savannas is quite open with many Eucalypts and Acacias scattered throughout. The ground is covered by many species of grasses, such as spear grasses, which grow during the wet season. When they dry out, grasses provide the fuel for the dry season fires. The plants in the Top End have a range of strategies to survive fire. These strategies include having thicker bark, seeds that can survive the fire or woody fruits. Some plants also re-sprout after fire. Soil temperature is also an important factor for seeds. The ground heats up in the wet and the combination of water and warmth results in germination of many species of plants.

During this experiment, you will learn about the mechanisms that seeds from different plants have, to help them survive the fires in the Top End Savannas. We will observe the effects of heat on seed germination by pouring boiling water on the seeds before planting them. The effect of heat will be different for different species. To examine this difference, we will use seeds from two species: Swamp Wattle and Native Lemon Grass. To observe what happens in our experiment, we will use the scientific method, in this case with two different treatments, that will involve following the experimental instructions and recording your daily findings. We will observe and record the number of seeds that germinate every day in different pots for two weeks. This will help to create an understanding about the different strategies that plants use to survive in the Top End.

Let's start our experiment!

**These are the materials that you have in your kit:**

- > 4 x seedling pots with labels
- > 1 x bag of potting mix (approx. 2.5 L).
- > 1 x measuring jug
- > 1x packet Swamp Wattle seeds
- > 1 x packet Native Lemon Grass seeds
- > 1 x envelope explaining the results.

**You will also need:**

- > 2 x containers that can hold about 250 ml of boiling water – mugs or microwaveable containers are best.



**Now you are ready to start. For the experiment to work, you should follow the step by step instructions below:**

1. Have a look at your materials. Take the four pots and read what they say. You should have two species, each with labels '**BOILED**' or '**NOT BOILED**':

*Acacia dimidiata*  
Swamp Wattle  
**BOILED**

*Cymbopogon bombvcinus*  
Native Lemon Grass  
**BOILED**

*Acacia dimidiata*  
Swamp Wattle  
**NOT BOILED**

*Cymbopogon bombvcinus*  
Native Lemon Grass  
**NOT BOILED**

2. Count 10 seeds from the **Swamp Wattle** seeds packet and place into one of the containers that will be used to hold boiling water.
3. Count 50 seeds from the **Native Lemon Grass** seeds packet and place them into another container that will also be used to hold boiling water.



- There should be at least 10 seeds left over in the **Swamp Wattle** seed packet and 50 seeds in the **Native Lemon Grass** seed packet. We will use these later.
- Boil the kettle. Once boiled, pour the water immediately over the seeds in the containers. Be careful when handling the hot water so that you don't burn yourself (get your parent or guardian to do it or help you with this step!).



- Leave these seeds in the containers until the water cools down. It should take approximately half an hour. We will do the other steps while the water is cooling.
- Now it is time to fill the plant pots with potting mix. Take the 100 mL measuring cup and add 200 mL of potting mix to all four pots. Tap lightly on a hard surface or press the soil down gently. Please take care when handling potting soil. Always wash your hands thoroughly after handling and take care to not breathe in the dust.



8. Make sure that you are using the correct pots by checking the labels. This is so that we can observe easily what the seeds will do based on which species they are and whether they received the boiled water treatment or not.
9. Now we will use 10 more seeds from the **Swamp Wattle** packet and 50 more seeds from the **Native Lemon Grass** packet. We do not pour hot water on these seeds. Make sure that you place the seeds of each species in the correct **Swamp Wattle** and **Native Lemon Grass** pots marked '**NOT BOILED**'. Sow the seeds by spreading them evenly across the soil.



10. Once the boiling water is cool, let's look at the containers holding our boiled seeds. Strain off the water taking care not to lose any seeds.
11. Place the boiled seeds of each species in the correct **Swamp Wattle** and **Native Lemon Grass** pots marked '**BOILED**'. Sow the seeds by spreading them evenly across the soil.
12. Now cover the seeds in the four pots with 50 mL of soil. Measure the correct amount of soil by using the measuring cup provided. Use your finger to evenly distribute the potting mix across the seeds. Your pots should now be full.
13. Each pot will need to be watered with 100 mL of water each morning and evening. Use your measuring cup to do this – remember to pour slowly and evenly across the surface of the soil, so that the seeds are not disturbed.



- Place all four pots into a warm, sunny position and water twice daily (see **STEP 13**). Check each day to see what happens. Record the number of seedlings that you see in each pot in the recording sheet provided.
- Check your pots for 14 days. **Swamp Wattle** and **Native Lemon Grass seedlings** should look like the photos below:



*Native Lemon Grass*



*Swamp Wattle*

- Share any questions and your results on our Facebook Page: [fb.me/NTSeedsExperiment](https://fb.me/NTSeedsExperiment) for a chance to win a Qwestacon Smart Lab Weather kit.
- Open the “Results” envelop after two weeks from the start of the experiment and check if your results match the expected results and the reasons behind it.

Use the QR code below to join us in our Facebook page: [fb.me/NTSeedsExperiment](https://fb.me/NTSeedsExperiment)



## Extra information about the species you will be growing

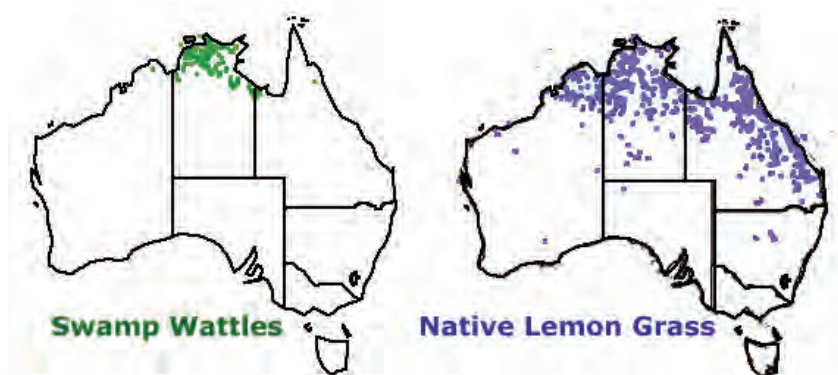
### Swamp Wattle – *Acacia dimidiata*

The Swamp Wattle is a shrub to small tree, growing between 1 to 4 metres. It has large phyllodes (which are modified leaves) – you could even say they are shaped like ears! Each flower is 1 to 2 mm wide, occurring together in cylindrical spikes around 4 to 5 cm long. Not long after flowering, slender woody fruits develop, each containing multiple seeds. As the common name suggests, it occurs near swamps, mainly in the Top End of the Northern Territory.

### Native Lemon Grass – *Cymbopogon bombycinus*

The native lemon grass (also known as citronella grass) is a moderate sized grass. Leaves often reach half a meter, but it can reach up to one metre with inflorescence (this is an arrangement of individual flowers grouped together!). The seeds are very light and fluffy when they ripen on the plant – perfect for wind dispersal! The fresh leaves can be harvested and brewed into tea, just like ‘normal’ lemongrass. It is fast growing and tolerant of a range of weather conditions. This grass is widely distributed throughout northern Australia and Queensland, occurring in open woodlands and stony country.

These maps show where you can find Swamp Wattle and Native Lemon Grass in Australia:



These maps were adapted from the Australian Virtual Herbarium  
– [www.avh.chah.org.au](http://www.avh.chah.org.au)



# Information about the STEM Kit developer:

## Anna Lemon

Anna Lemon has lived in the Northern Territory most of her life. She became interested in the environment at a young age and following high school quickly became interested in native plants. Anna spent several years growing and supplying native plants before deciding to study a Bachelor of Science (Ecology) at Charles Darwin University. She is currently undertaking a research project as part of the Honours program and hopes to one day be a botanist looking at all the plants in the Top End!



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