



EXPERIENCE • DISCOVER • CREATE

TGE's Gardening Workshop

Key take-away from today session:

- Why Farm? - Singapore's food supply situation
- Understanding the 'Science' in home farming
- Innovating to address some of the challenges in home farming
- Our experience
- Online resources



The food we eat

& where it comes from



Amount of food an average Singaporean ate in 2011



Although Singapore imports more than 90% of our food

Local farms provide the food we eat too

AVA aims to raise Singapore's self-sufficiency levels for eggs, fish and leafy vegetables to 30%, 15% and 10% respectively

Top 3 overseas sources of vegetables

- #1 Malaysia
- #2 China
- #3 Australia



Top 3 overseas sources of fruits

- #1 Malaysia
- #2 China
- #3 US



Top 3 vegetable imports

- #1 Potatoes
- #2 Onions
- #3 Cabbages

Top 3 fruit imports

- #1 Watermelons
- #2 Bananas
- #3 Oranges

Challenges	Description
Danger of our food supply running short	Due to outbreaks of food diseases in countries that we export our food from
Danger of our food supply being cut off	Due to the closing of a port in countries that we export our food from
Supply problems	Caused by political changes in neighbouring countries.

Source: <https://www.ava.gov.sg/explore-by-sections/food/singapore-food-supply/the-food-we-eat>



Green Fingers. Myth or Fact?

- Some people just seems to have all the luck when it comes to farming while others can't seem to get their plants to grow...
- What did they do right?



Understanding the Science behind home farming

The basic requirements of a healthy plant are sufficient light, adequate watering, sufficient aeration, good soil mixture and regular fertilising.

What's the correct recipe?



The RIGHT recipe!

Learning from the knowledgeable others

- Readily available local resources available at the tip of your fingers
- Nparks Gardening Resources
- Social Media – Facebook groups. For example, Urban Farmers, Vermicomposting, etc



Nparks Gardening Resources

Gardening Resources - C x

Secure | https://www.nparks.gov.sg/gardening/gardening-resources

Home > Gardening > Gardening Resources

Community Garden Edibles Competition

Community Gardens

Community in Bloom Initiatives

Allotment Gardens

Gardening Resources

→ **Flora & Fauna Web**

→ **Hands-on Gardening Videos**

→ **What to Grow**

→ **Caring for plants**

→ **Tropical Landscaping**

Last updated on 11 February 2016

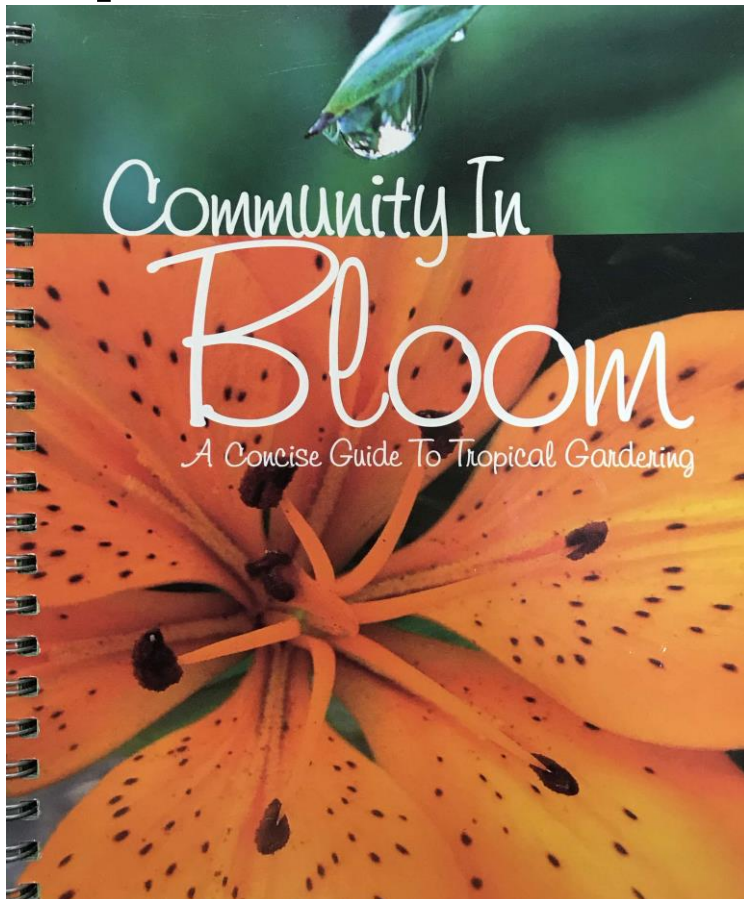
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Nparks Gardening Resources



Vegetables

Vegetables need lots of sunlight, water and fertiliser. Most are non-woody plants. Here are some commonly-grown vegetables:

Leafy Greens

1. Chinese Spinach, Bayam
Amaranthus gangeticus
Marketable height 0.4m
Red and green leaf varieties;
propagated by seeds.



2. Chinese Kale, Kai Lan
Brassica alboglabra
Marketable height 0.4m
Propagated by seeds.



3. Cai Xin
Brassica chinensis var. *parachinensis*
Marketable height 0.4m
Propagated by seeds.



4. Kang Kong
Ipomoea aquatica
Marketable height 0.4m
Flower colour variations -
white or pink;
propagated by seeds;
stems are hollow.



5. Lettuce
Lactuca sativa
Marketable height 0.25m
Leaf colour variations - light green,
dark green and some red;
propagated by seeds.



5

Nparks Gardening Resources

Symbol



Amount of light

2-4 hours of moderate intensity light each day usually higher humidity.

4-5 hours of high intensity sunlight everyday.

At least 6 hours of high intensity sunlight everyday.

Water requirements

The symbols represent different water requirements:

Symbol



Amount of water

Needs a lot of water.

Needs moderate amount of water.

Needs little water.

Needs spraying - to make the area around the plant damp.



THEGREENEXPLORERS

Limitations of home farming - Sunlight

- As our earth orbit and spin around the sun, the sun direction in Singapore changes throughout the year.

For example...

- From March To September, the afternoon sun is in the north-west direction.
- From September to March, the afternoon sun is in the south-west direction.



Limitations of home farming - Sunlight

- So, for east facing unit, you get no afternoon sun throughout the whole year.
- For west facing unit, you get afternoon sun throughout the whole year.
- For north facing unit, you get afternoon sun from March to September.
- For south facing unit, you get afternoon sun from September to March.



Online Resources

- <https://www.timeanddate.com/sun/singapore/singapore>
- <http://suncalc.net/#/1.3507,103.7288,16/2018.04.08/09:17>



Using Grow Lights as Sunlight supplement



LED technology has been improving tremendously in the past few years. Plants benefit mostly from the blue and red parts of the spectrum but making the best light is not as simple as using random blue and red LED chips.



Using Grow Lights as Sunlight supplement

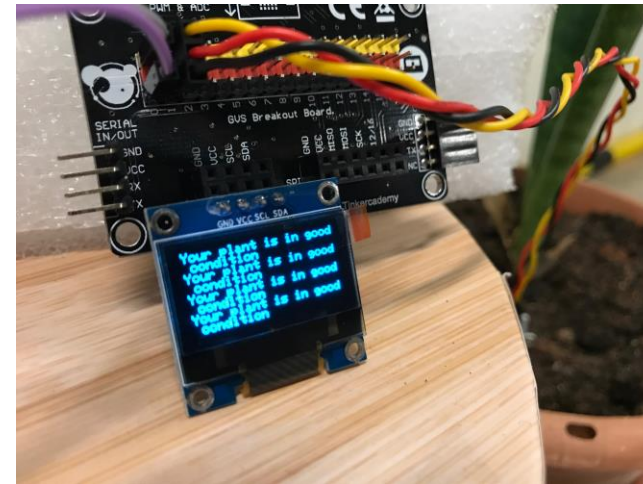


Different ratios of red and blue light will affect different types of chlorophyll. Not only that, plants need different wavelengths during different phases of growth. For example, plants benefit from the red spectrum during the flowering phase.

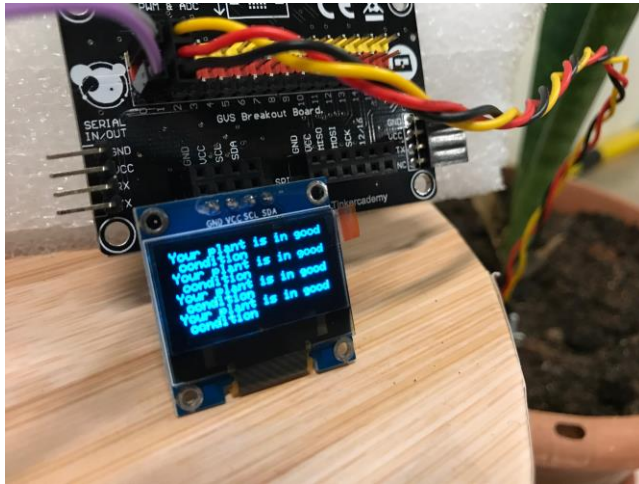


Limitations of home farming - Water

- Watering is one of the main challenges facing Urban Farmers who works irregular hours or travel on a regular basis.
- Edibles require lots of water on a constant basis.



Innovating - DIY watering solutions



- MicroBits with a breakout board
- Step-by-step guides online to create a plant monitoring system
- Incorporate a water pump and you are good to go!

Soil conditions and how to improve it

Soil conditions and how to improve it

Hydroponics and Aquaponics



What did our experiences tell us?



What did our experiences tell us?



What did our experiences tell us?



Online Resources

<https://www.nparks.gov.sg/gardening/gardening-resources>

<https://tinkercademy.com/tutorials/plant-monitoring/>

<https://florafauweb.nparks.gov.sg/>

<https://www.facebook.com/groups/sgurbanfarmers>

