

HYDROPONICS WORKSHOP



HOME HYDROPONICS

■ Introduction

- About Hydroponics
- Basic principles of hydroponics
- Benefits
- Types of hydroponic systems
- How to start – easy plants to start with
- Plants that grow well in a hydroponic system

■ Hydroponic system installation

- Growth Management (Fertilization)
- Tools / Materials / Space requirements
- Light in hydroponics

Hands – on practice



INTRODUCTION IN HYDROPONICS

BASIC PRINCIPLES, EASY PLANTS TO START

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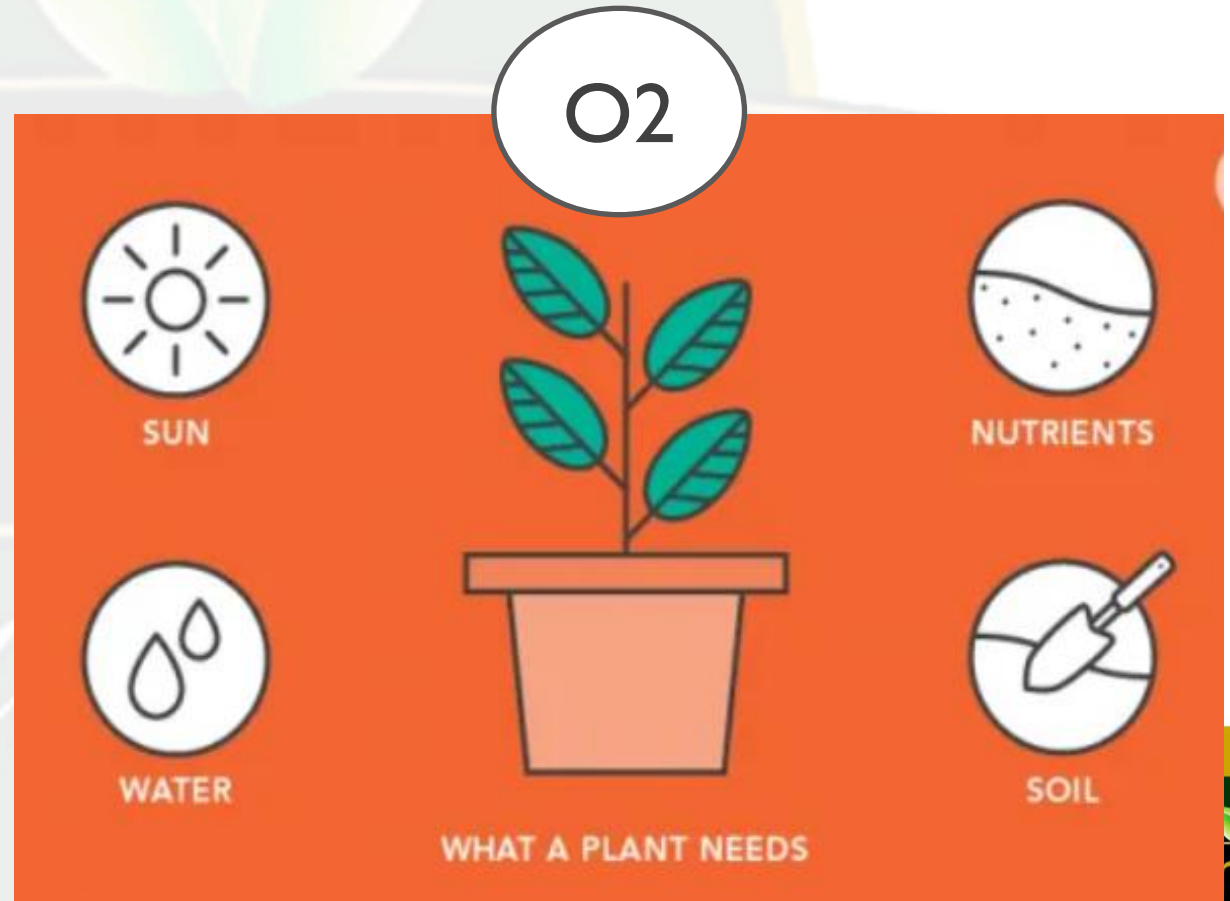
HYDROPONIC

The growing of plants in nutrient solutions with or without an inert medium (such as perlite, rockwool and cocopeat) to provide mechanical support to plants



BASIC PRINCIPLE

Provide plants exactly what they need and when they need it.



PLANTS NEED FOR GROWTH

- **Water**
- **Nutrients**
- **Air**
- **Oxygen to the root zone**
- **Light**
- **Mechanical support**



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BENEFITS OF HYDROPONICS

- Less space more production
- Year round production
- Require less labor
- Free of pesticide
- Avoiding soil (no risk of soil related diseases)
- Controlled environment
(Temperature, humidity, light)

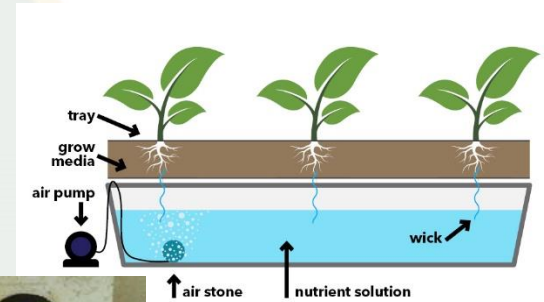


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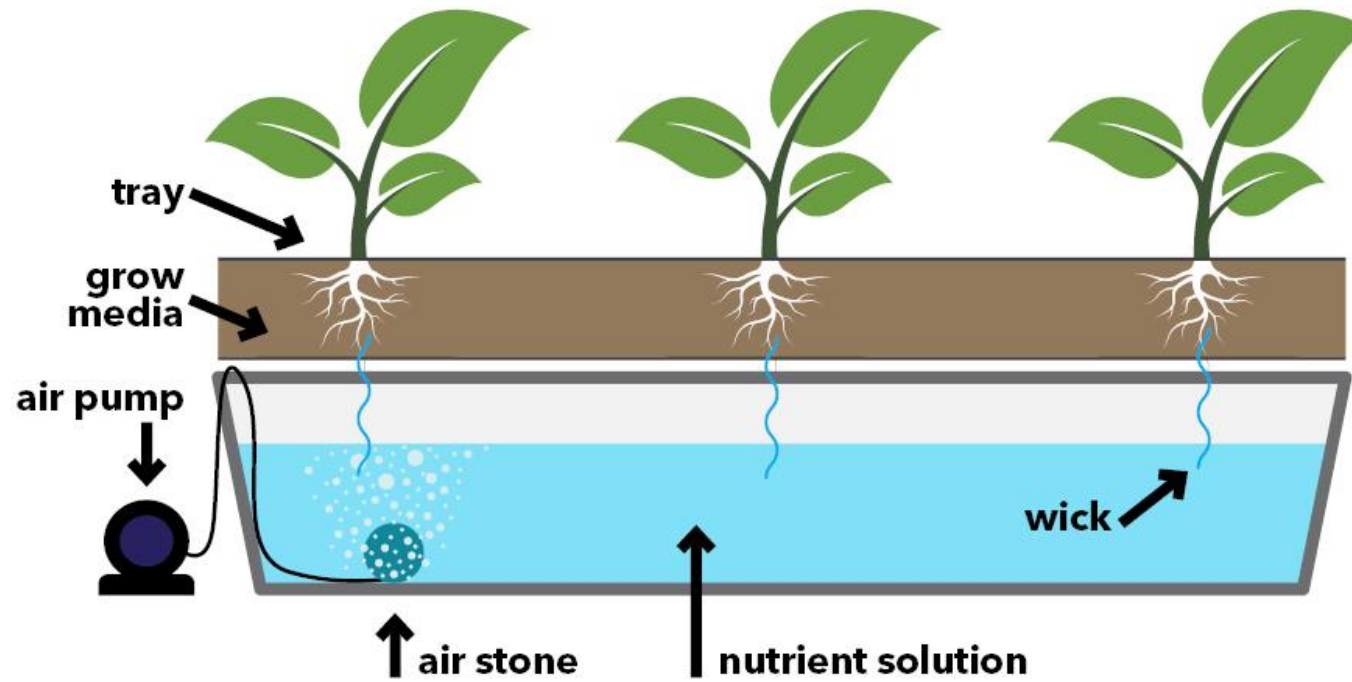
TYPES OF HYDROPONIC

There are 6 types of hydroponic systems:

- Wick system
- Deep water culture
- Ebb and flow system
- Drip system
- NFT system
- Aeroponic system



WICK SYSTEM



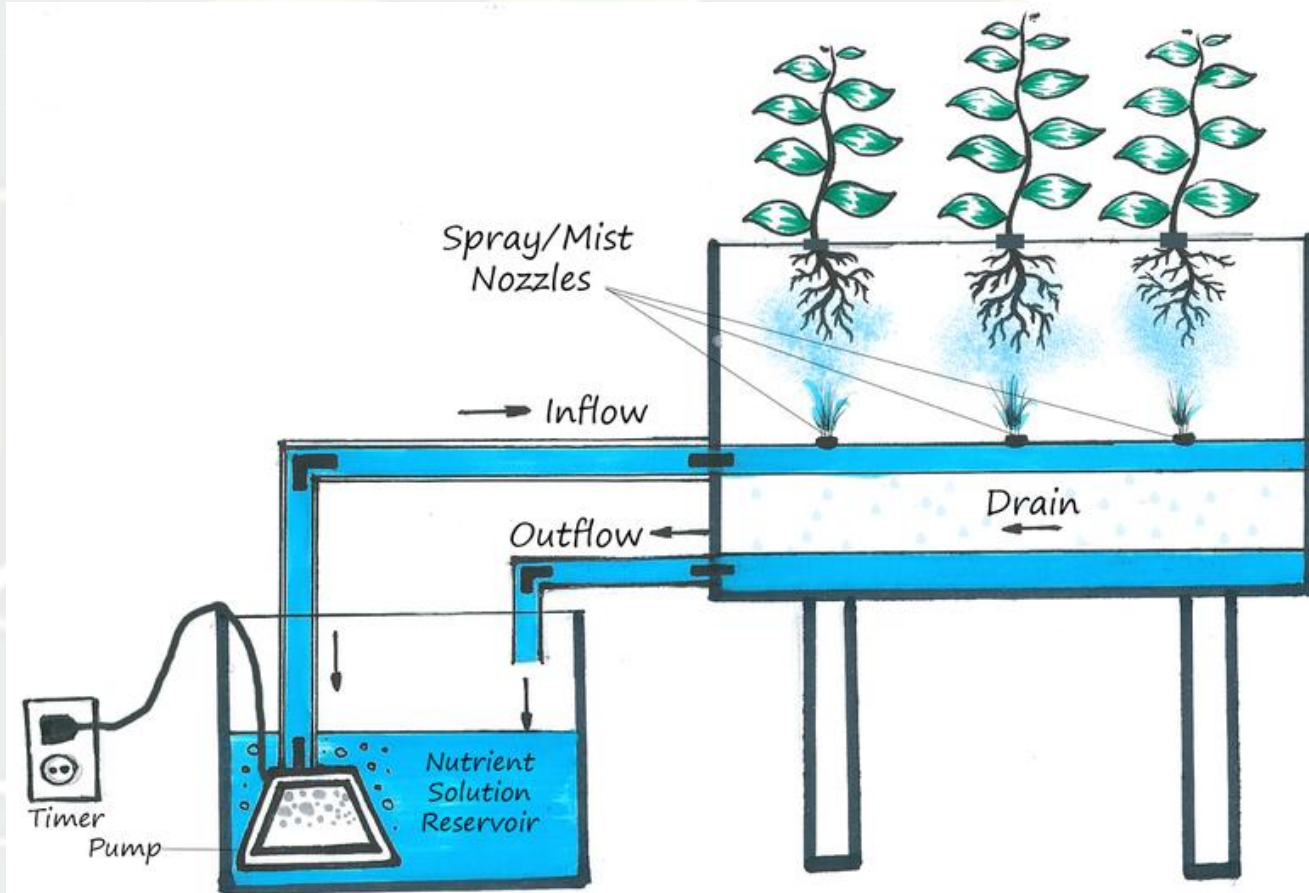
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DRIP SYSTEM



AEROPONIC SYSTEM



NUTRIENT FILM TECHNIQUE (NFT)



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NFT



DWC



HOW TO START

Easy plants to grow in hydroponics

Leafy greens

- Lettuce
- Salads
- Kale
- Swiss chard



GROWTH MANAGEMENT

Nutrition is a critical factor for:

- A good crop yield; A well fed plant can feed well many humans.
- Healthy, good looking plants
- Plants resistant to enemies



CALCULATION OF PLANTATION AND PRODUCTION OF LETTUCE

Total area (Sqm)	16
Plants per m2	25
No of plants	400
Yearly harvesting cycle	9
Crop duration	40 days
Production	712 kg

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WHICH PLANTS CAN BE GROWN IN HYDROPONICS

- ALL VEGETABLES CAN BE GROWN IN HYDROPONICS
- TOMATO, CUCUMBER, MELONS, BELLPEPPER, EGG PLANT, LEAFY GREENS ETC

NUTRIENT FILM TECHNIQUE (NFT)

- A very shallow stream of water containing all the dissolved nutrients required for plant growth is re-circulated in plant roots through round and flat channel.



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MATERIALS REQUIRED

- **NFT system**
- **Seed**
- **Water**
- **Nutrients**
- **Perlite or other growing media**
- **Sponge**
- **EC and pH meter**

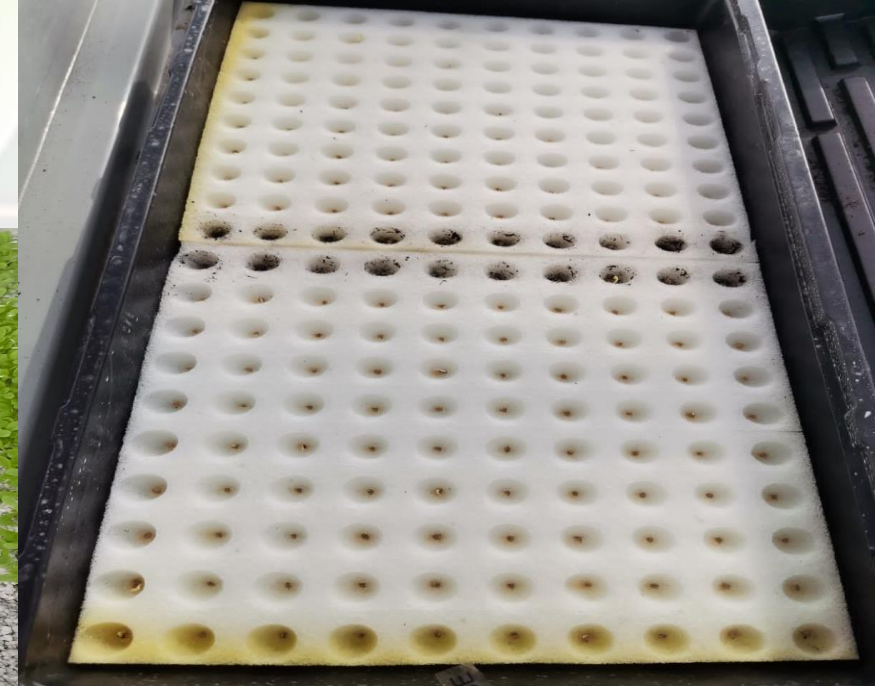
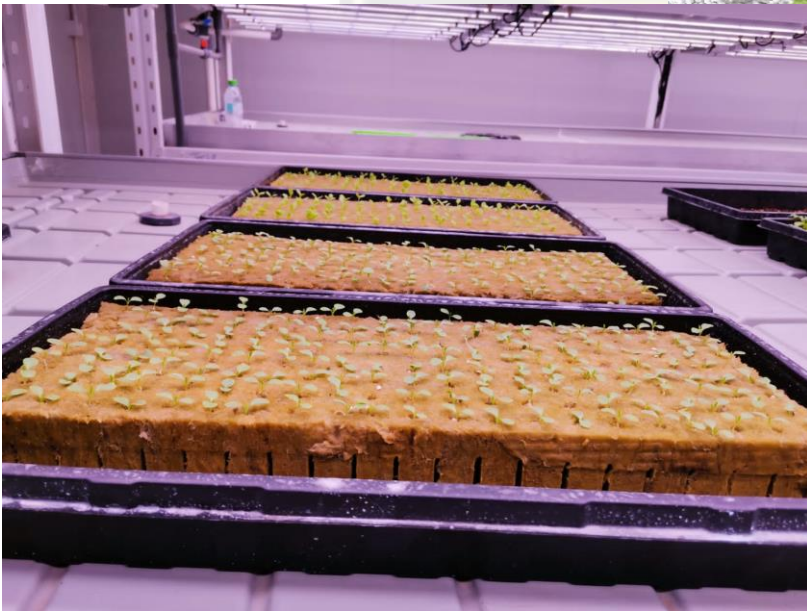
GROWING MEDIUM

Characteristics of the best growing medium:

- Long lasting,
- Healthy,
- Porous,
- Lightweight,
- Compact free,
- High water holding capacity,



DIFFERENT GROWING MEDIA FOR SEEDLING



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PLANT NUTRITION

Macronutrients:

- **Primary:** N, P, K
- **Secondary:** Ca, Mg, S

Micronutrients: Fe, Mn, Zn, Cu, B, Mo



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RECIPE FOR LEAFY GREEN

STOCK A (20 L)	
CALCIUM NITRATE	3 kg
IRON	40 g
POTACIUM NITRATE	1 kg
STOCK B (20 L)	
MONO POTACIUM PHOSPHATE	600g
MAGNACIUM SULPHATE	800g
BORIC ACID	20 g
ZINC	10 g
COPPOR	2 g
MANGNESE	10 g
AMONIUM MOLYBATE	0.5 g

GROWTH REQUIREMENT OF LEAFY GREEN

- pH 5.8 to 6.2
- Temperature: 25 C
- Humidity: 65 %
- Ec 1.5 to 2
- Light
 - 80 $\mu\text{mol}/\text{m}^2/\text{s}$ during seedling
 - 150 $\mu\text{mol}/\text{m}^2/\text{s}$ during vegetative phase

TOOLS & MATERIALS FOR NFT

- Growing medium (optional, for large plants)
- Pipes
- Pump
- Oxygen supply
- Grow lights
- Water connection
- Nutrient solution / Fertilizers
- Gardening scissors



LIGHT

Plants need

Red

Blue

White light for
photosynthesis

(420nm- 700nm)

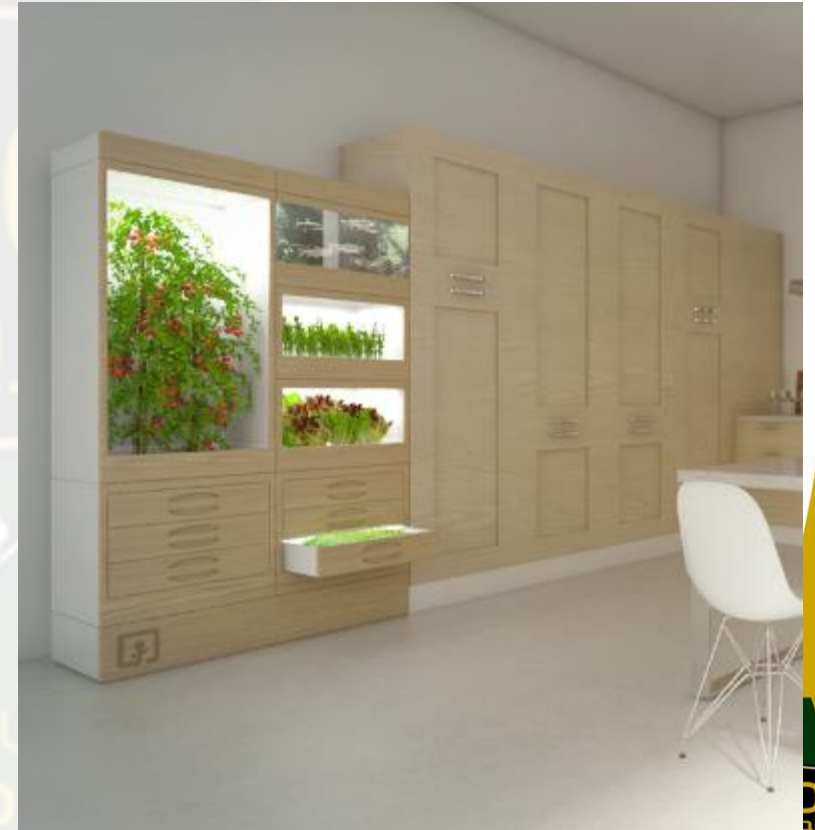


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HOME HYDROPONICS EXAMPLES



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THANK YOU!

For any questions, you can contact us at:



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