

Basic Hydroponic Systems

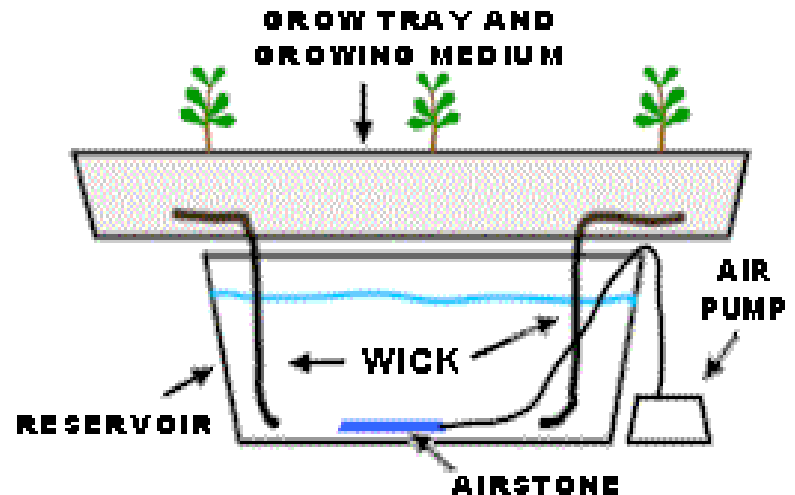
There are 6 basic types of hydroponic systems:

- _____
- _____
- _____
- _____
- _____
- _____

There are hundreds of variations on these basic types of systems, but all hydroponic methods are a _____ (or _____) of these six.

Wick System

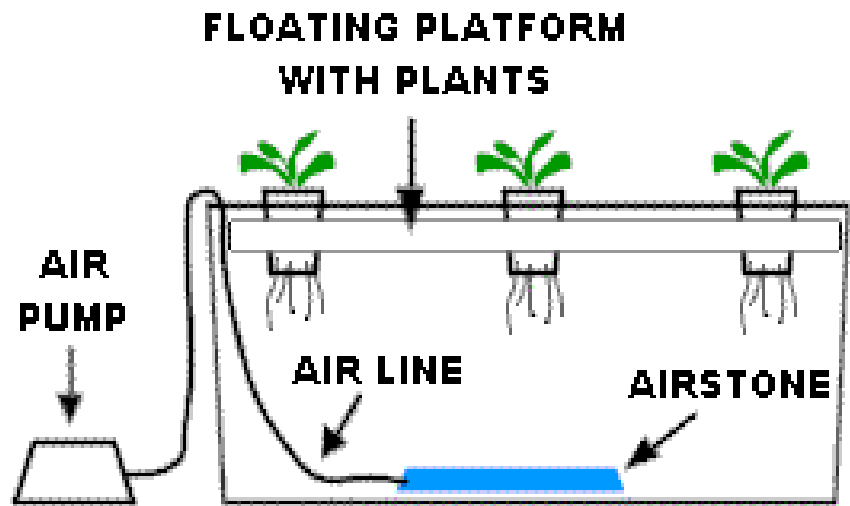
- The Wick system is by far the _____ type of hydroponic system.
- This is a _____ system, which means there are _____.
- The nutrient solution is drawn into the growing medium from the reservoir with a _____.
- This system can use a variety of _____.
 - Perlite, Vermiculite, Pro-Mix and _____ are among the most popular.
- The biggest drawback of this system is that plants that are large or use large amounts of water may use up the nutrient solution faster than the wick(s) can supply it.



Water Culture

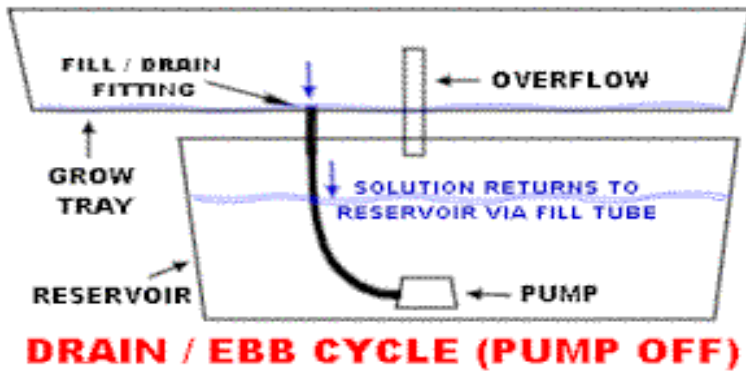
- The water culture system is the simplest of all _____ hydroponic systems.
- The platform that holds the plants is usually made of Styrofoam and floats directly on the nutrient solution.

- An _____ supplies air to the air stone that bubbles the nutrient solution and supplies _____ to the roots of the plants.
- Water culture is the system of choice for growing _____, which are fast growing water loving plants, making them an ideal choice for this type of hydroponic system.
- Very few plants other than lettuce will do well in this type of system.
- A very inexpensive system can be made out of an old _____ or other water tight container.
- The biggest drawback of this kind of system is that it doesn't work well with _____ plants or with _____ plants.



Ebb and Flow (Flood and Drain)

- The Ebb and Flow system works by temporarily _____ the grow tray with nutrient solution and then _____ the solution back into the reservoir.
 - This action is normally done with a _____ that is connected to a timer.
 - When the timer turns the pump on nutrient solution is pumped into the grow tray.
 - When the timer shuts the pump off the nutrient solution flows back into the reservoir.
 - The Timer is set to come on several times a day, depending on the size and type of plants, temperature and humidity and the type of growing medium used.
- The Ebb & Flow is a versatile system that can be used with a variety of _____.
- The entire grow tray can be filled with Grow Rocks, gravel or granular Rockwool.



- Many people like to use _____ filled with growing medium, this makes it easier to move plants around or even move them in or out of the system.
- The main disadvantage of this type of system is that with some types of growing medium (Gravel, Growrocks, Perlite), there is a vulnerability to _____

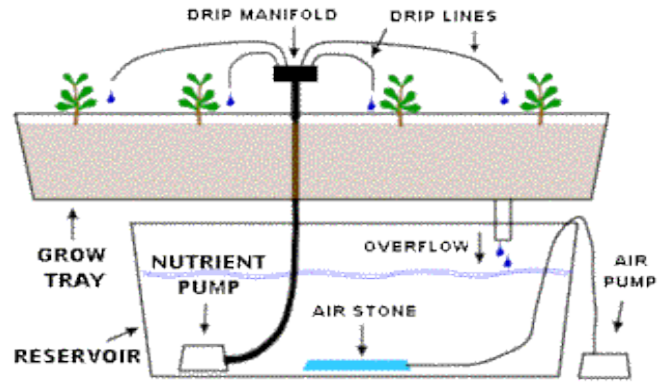
_____ as well as _____.

- The roots can _____ quickly when the watering cycles are interrupted.
- This problem can be relieved somewhat by using growing media that retains more water (Rockwool, Vermiculite, coconut fiber or a good soilless mix like Pro-mix or Faffard's).

Drip System

- Drip systems are probably the most _____ type of hydroponic system in the world.
- Operation is simple, a timer controls a submersed pump.
 - The timer turns the pump on and nutrient solution is dripped onto the base of each plant by a small drip line.
 - In a Recovery Drip System the excess nutrient solution that runs off is _____ back in the reservoir for re-use.
 - The Non-Recovery System _____ the run off.
- A recovery system uses nutrient solution a bit more _____, as excess solution is reused.
- This also allows for the use of a more inexpensive timer because a recovery system doesn't require _____ of the watering cycles.
- The non-recovery system needs to have a more precise timer so that watering cycles can be adjusted to insure that the plants get enough nutrient solution and the runoff is kept to a minimum.

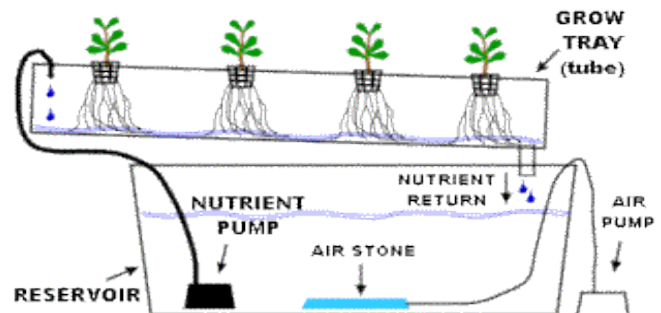
- The non-recovery system requires _____ due to the fact that the excess nutrient solution isn't recycled back into the reservoir, so the _____ of the reservoir will not vary.



- This means that you can fill the reservoir with pH adjusted nutrient solution and then forget it until you need to mix more.
- A recovery system can have large shifts in the pH and nutrient strength levels that require _____.

Nutrient Film Technique

- This is the kind of hydroponic system most people think of when they think about hydroponics.
- N.F.T. systems have a _____ of nutrient solution so no timer required for the submersible pump.
- The nutrient solution is pumped into the growing tray (usually a tube) and _____ over the roots of the plants, and then _____ back into the reservoir.
- There is usually _____ used other than air, which saves the expense of replacing the growing medium after every crop.
- Normally the plant is supported in a _____ with the roots dangling into the nutrient solution.
- N.F.T. systems are very susceptible to _____.
- The roots _____ very rapidly when the flow of nutrient solution is interrupted.



Aeroponics

- The aeroponic system is probably the most _____ type of hydroponic gardening.
- Like the N.F.T. system above the growing medium is primarily _____.
- The roots hang in the air and are _____ with nutrient solution.
- The misting's are usually done every _____.
- Because the roots are exposed to the air like the N.F.T. system, the roots will _____ rapidly if the misting cycles are interrupted.
- A _____ controls the nutrient pump much like other types of hydroponic systems, except the aeroponic system needs a short cycle timer that runs the pump for a few seconds every couple of minutes.

