Basic Cloning

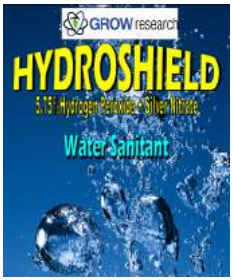
A simple method of plant propagation for hydroponics

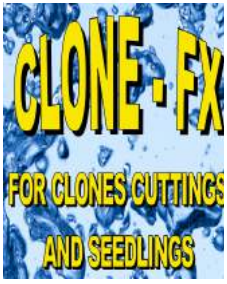
HYDROCENTRE
hydroponics

Basic Cloning

Cloning is the process where cuttings are taken from plants you wish to replicate because of desirable characteristics, eg: good growth habit, flower size and shape, specific cultivars or desirable fruit.

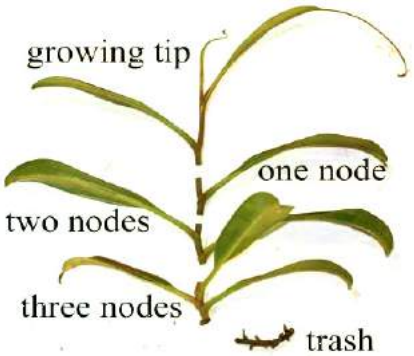
Tools and Equipment needed:

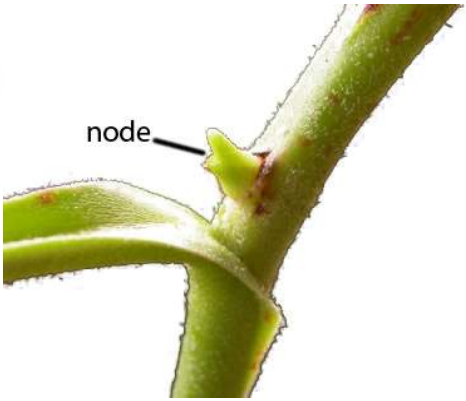




- Sterilising Agent (Hydroshield)
- Rooting Hormone (Clonex)
- Rockwool Cubes (40mm wrapped)
- Closed Propagator
- Sterile Scalpel
- Butter Knife
- Donor Plant
- Fluorescent Light and Grow Spectrum Tube
- Anti-Transpirant Clone Nutrient (Clone-fx)
- Basin

Taking Cuttings





Step 1: Preparation

Fill basin with water and add 2-4ml of Hydroshield for every litre of water in the basin. This is to kill any bacteria, virus or fungus before stsaring.

Sterilize all tools, basin, propagator with the Hydroshield solution and wash your hands.

Soak Rockwool Cubes. Leave everything to soak for 10-20 minutes (minimum 6 minutes for Hydroshield to work) You can save the water the water in the basin for step 4.

Step 2: Selecting Cloning Material

The Parent should be healthy and stress free, around 4-6 weeks old is ideal, as cutting should be taken before the flowering begins.

If flowering has begun this will put additional stress on the donor plant.

There should be no trace of pests. The distance between growth nodes should not be more than 50mm ideally, as this will produce bushier plants.

Step 3: The Initial Cuts

The initial cut is made from 25mm below a node (where the branch joins the stem).

The stem thickness should be 5-10mm and the outer layer of stem cells should be young fresh tissue, and not too woody.
Leaves are required for the plant to survive but too many leaves will cause the cutting to lose too much moisture.

All but one of the leaves should be removed or cut in half to relieve stress on the cutting

Step 4: Cut Underwater

Fill a basin or tank and add 2-4ml of Hydroshield for every litre of water.

Place your cutting underwater and make your final cut at a 45 degree angle across the stem, just below the growth node.

Trim the node so it is flush with the stem.

The reason for cutting underwater is so the stem will not draw air bubbles in when the cut is made. Air bubbles usually kill a cutting they do not always occur so it is a preventative action, not an essential one.

The cutting is soaked in Hydroshield to prevent bacteria and infections forming on the cut just made. Leave to soak for 6-10 minutes.

Step 5: Dip in Cloning Gel

Dip the cutting into the gel to 25mm depth.
Use gel no older than 3 months as it can break down and get contaminated, introducing moulds, bacteria or viruses into your cutting.
Keep the unused gel in the fridge after opening.
You can also use root hormone powder if you don't have access to cloning gel or you prefer to use powder.

Step 6: Insert the cutting with a blunt blade

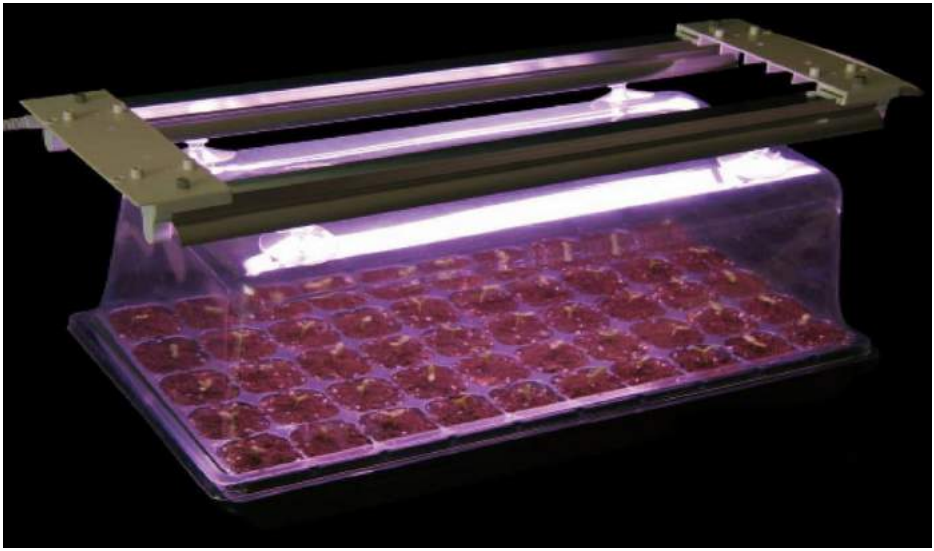
Insert the round ended kitchen knife into the rockwool cube. Using the blade as a guide, slide the cutting down the blade, into the cube to 25-30mm deep and then gently remove the knife. A toothpick can also be used to make a hole if you do not have access to a suitable knife.

Step 7 : Place into closed propagator

Place the cutting and rockwool cubes into the propagator, closing all vents.

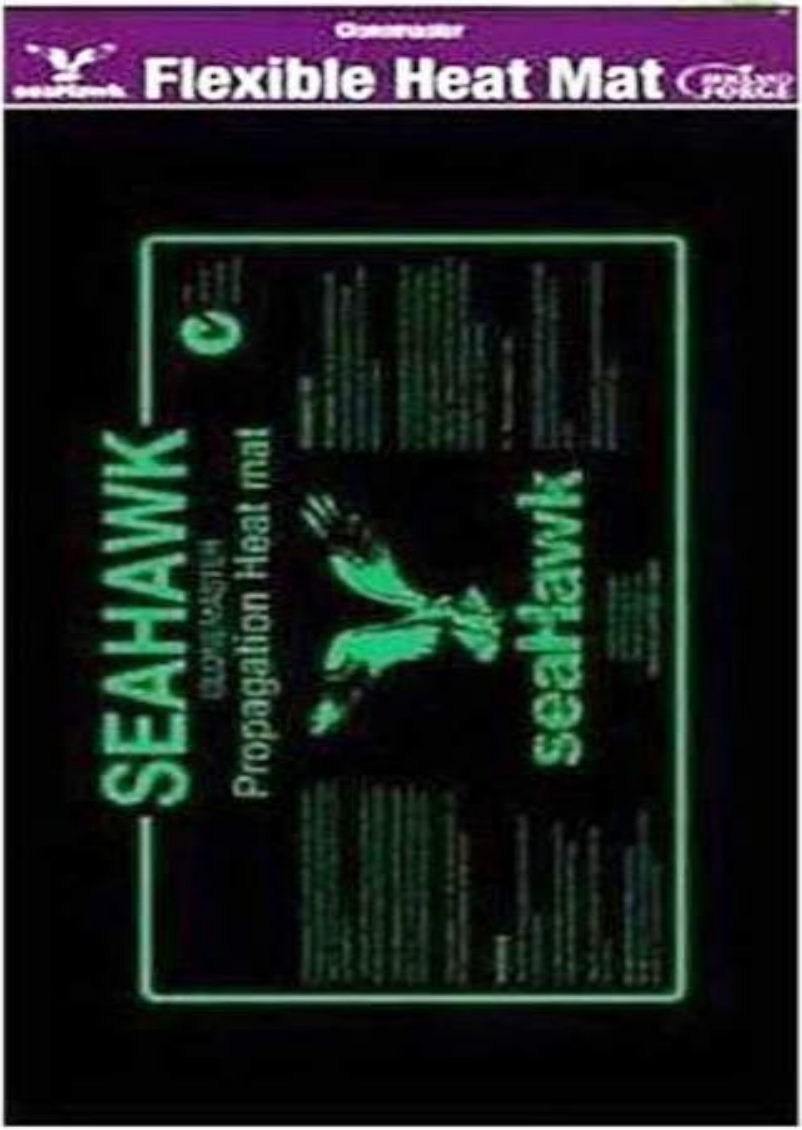
Step 8: Set up lighting

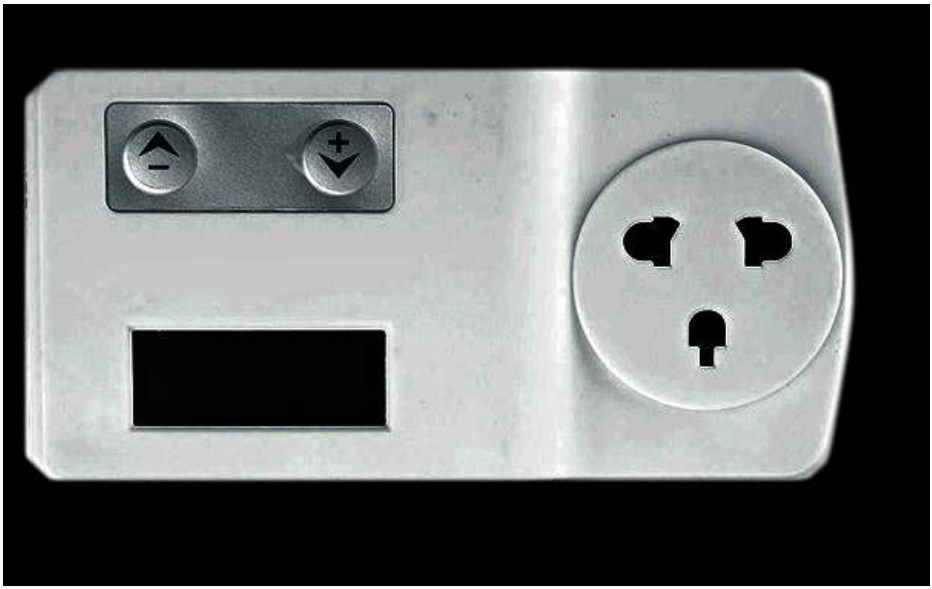
Set up fluorescent lighting to 18 hours. It should be as close as possible to the propagator, within 150mm (6”) of the cuttings.



Step 9: Set Temperature

Temperature should be 20-25 degrees celcius. A propagator heating mat and thermostat can be added if necessary.





Find a place that is not warm or cold, eg: on top of the fridge, the hot water system. Avoid using Hydroponic lighting other than fluorescents and direct sunlight. Excess heat will dehydrate the cuttings and they do not have roots to absorb moisture.

Step 10: Avoid too much care

Keep the propagator closed. Check there is moisture droplets condensing on the inside of the propagator. Remove the lid of the propagator every day to remove stale air, then spray cuttings with clone-fx, weak grow nutrient at a strength of 20% or plain water until moist. Replace the lid to preserve moisture and prevent drying out.
Avoid lifting the lid all the time to check on the cuttings.

Step 11: Hardening Off

Open up one vent after around days if they have not wilted. Open another vent the next day if the clones do not show signs of stress and have wilted. If they do show signs of wilting, close up the vents and gradually open the lid a little over the next 3 days.

If any wilting occurs, close them up and start again within 24 hours. Keep out of heat, cold and high ventilation. If the rockwool is stating to dry out, use a cloning agent or 20% strength grow nutrient.

Step 12: Planting Out

At about 2 weeks, most cuttings have enough roots to be called clones. Clones are cuttings ready to be planted out. Each time you take cuttings, you will need to observe and evaluate the process.

If the cuttings seem to wilt badly or develop problems then perhaps they need more time to develop before transplanting.

If the cuttings need more than 3 weeks, you can help by adding vitamins and more clone nutrients. If they still don't look ready then be patient. Patience will result in significantly stronger plants than removing plants with barely enough roots to support themselves.

Setting up an ongoing cloning system:

Mother Plants/Donor Plants

The mother or donor plant produce cuttings that are placed under fluorescent lamps after 18 hours.

Cuttings:

Cuttings take about 2 weeks to get roots. Always label cuttings if there is more than one mother plant. It is still a good idea to label cuttings in case you forget which cultivar or mother they came from.
A way to distinguish your different cuttings from the same mother is Mother Plant A produces Clone Plants A1, A2, A3 etc. Mother Plant B produces Clone Plant B1, B2, B3 etc.

Sexing:

The best way to determine the sex of clones is to force flowering of the mothers while the clones are still growing. You can then destroy any undesirable cuttings/clones. Putting a mother into flowering and then returning the lighting to 18 hours to try and take clones is **a Highly Stressful Procedure** and can turn female plants into hermaphrodites and thus eliminating the scientific basis of the procedure.

Clone Stage:

Clones are cuttings that have developed roots. After cuttings have developed enough roots to support themselves you can upgrade the lighting system to 80w FCFL Fluroescent, 400w Metal Hallide or a High Pressure Sodium lamp(HPS.)

Use care if using a 600w light as the light intensity and heat is much greater than the fluorescents the clones were started with. Avoid stressing the new plants with drastic changes to their environment.

Vegetative Stage:

Clones will need a minimum of 2 weeks, usually 4 weeks to develop before commencing flowering. One or two cuttings will need to be selected to replace the mother plant to keep the genetic material strong, strike rate high and the stress levels low.

Flowering Stage:

Generally, the flowering period under 12 hours of lighting will last for 8 weeks. This will differ from plant to plant so do some research on what type of species you are growing and act accordingly.

If at any stage you have the opportunity to save some pollen in a sealed bag, it can be used at a later date to pollinate your flowers to get seeds with different genetic material.

3/4 Light System:

T5 fluro or High Output CFL fluros to grow cuttings and clones. You may be able to keep a mother plant under CFL.

250w/400w/600w for growing mother plants under an 18 hour lighting system.

400w/600w - Vegetative grow room where cuttings are ‘beefed up’ in the 18 hour room for 2-4 weeks, then moved to a very bright 12 hour flowering room.

600w Flowering Room - a 12 hour lighting room for flowering plants, approximately 8 weeks.

If you take cuttings from a mother plant too many times, your plant will start to stress. It is best to allow one or two new cuttings per batch to become new mother plants.

2 Light System:

250w or 400w room - This involves using an 18 hour room for growing and using shaded light from the 18 hour light to strike and beef up cuttings. A fluro could be used for cuttings stage. HPS lighting is not recommended as clones can dry out under the heat of the lights. It is advised to use a fluorescent system for better results.
600w flowering room - 18 hours a day for 8 weeks.

1 Room System:

This involves using an 18 hour room to produce plants which are moved out into sunlight during times of low light eg: Winter months. This suits some growers but not all. Be careful to allow enough time to finish flowering before the winter months end and the plants revert to the grow stage.

Advice is general and for a wide variety of plants. Always seek specific advice for your own growing situation.
If your plants are not perfect then feel free to seek help and advice to suit your specific growing requirements.

Advice Line:
Phone: (07) 5527 4155
Email: info@hydrocentre.com.au
Website: www.hydrocentre.com.au

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