

VERTICAL GARDENING THINGS TO KNOW

- 1. Adjusting the Nutrient Solution:** At any time you may fill (or top off) the nutrient tank. In recirculating hydroponics a wide range of nutrient concentrations can be tolerated for a short period of time, if you use a low salt index, soluble formula such as the type supplied by **Verti-Gro**.

Note: There are several formulas available. See specific instructions for each formula. The volume of the tank can drop to below half full and still not harm the plants. However, the more consistent the nutrient solution, the more consistent the production will be. Topping off the tank every 2 or 3 days should be sufficient. This depends on the size of your plants and the temperature. Adjust the nutrient solution approximately 1 week after the initial mixing. Seven days is not critical, it may be 5 to 8 days in some cases. For example, if you are going away for the weekend, you can adjust the nutrient on Friday or Monday as long as there is enough water in the tank.
- 2. Dumping the Solution:** It is recommended that you dump your solution about every two weeks. This depends on your water quality. If you have softened or salty water it is a good idea to change your solution often. It is not necessary to pump out or dump out the entire tank. Some solution left over is not a problem. Make sure the pump is lying down on the bottom of the tank. Disconnect the clear plastic tubing from the plumbing unit and pump the solution into a container or into your yard.

Note: This is still good fertilizer solution, use it on any plants in your house or garden. You may want to purchase a longer piece of tubing. The tubing that fits in the 1/2" poly insert is available at most hardware stores (or you may use a 5/8" garden hose)
- 3. Mixing and adjusting the nutrient solution:** The mixing, adjusting, and changing of your solution is not supposed to be inconvenient or difficult. The most important thing is to not let the plants run out of water! The pump will not work properly when the tank is below 25% full. Add 1 cup of vinegar & 1 cup of Hydrogen peroxide to each tank every time you add nutrient and the pH will stay in better range and the water cleaner.
- 4. Checking the pump:** If the pump stops pumping (when submerged in water) take it out of the tank and look at the inlet. Perlite caught in the propeller is the most common problem with the pumps. Simply take the cover off and with a small screwdriver see if the blade rotates. Perlite is fairly soft so it will break away into smaller pieces in most cases.

5. **Pump Warranty:** The pump is guaranteed for one year. If the pump is not working check to see if the flow adjuster is closed. After checking for clogging problems, please call (352) 750-4202 and state the reason for needing a replacement. One will be sent UPS to you at no charge. Return the old pump or you will be charged for the replacement pump.
6. **Adjusting the Nutrient Emitters:** In recirculating hydroponics (or organics) a very low flow of water from the emitters is all that is required. Once the media is wet it will stay wet with a very small flow rate. Only 1-2 gallons per hour is required. This is just enough to see water bubbling out the emitter. Adjust the flow by turning the emitter head as needed. If the emitter plugs, simply wash it out. Before replacing the emitter turn on the pump and check to see if the flow of nutrient solution is coming out of the pipe. If not, then check the PVC riser pipe.
7. **Tank Cleaning:** Since it is impossible to keep all debris out of the tank it is advisable to take off the **Verti-Gro** pots, remove the lid and clean the tank every six months or so. Use regular chlorine solution diluted 1:1 to clean tank and lid.
(You can also use 1/2 oz. of Hydrogen Peroxide per gallon of water to keep system clean)
8. **Rotating or Removing Pots:** The **Verti-Gro** pot is designed to stack and be rotated. It can be rotated 90° or 180°. The bottom pot can be moved to the top, middle pots can be rearranged, etc... Simply take the pots off the PVC riser and adjust, clean, replant, or rotate as needed. In northern areas it is advisable to rotate the pots 180° every week to insure even growth. The very bottom pot is more difficult to rotate and does not need to be rotated every time. Simply lift the stack of pots about 2-3" and rotate 90-180°. For tall stacks it may require 2 people to do this easily.
(For starter kits used outdoors 2 swivels and a piece of 1.5" riser pipe is supplied)
9. **Plant Care:** Certain plants are easy to grow and others are more difficult. For example, herbs are very easy as is lettuce, but tomatoes, peppers, and other larger plants may need more care. This is especially true when pruning or stacking. Tomatoes and peppers may be grown in the "Vertical Garden", however, use short or bush varieties. The "Patio" tomato is excellent. "Better Bush" and several other "bush" or "determinant" varieties of tomatoes can be grown in the system. Prune tomatoes after one hand is set. Do this by going one leaf above the flowering hand and remove the entire top of this branch. It is possible to get 10 tomatoes off each plant using this method of pruning. It is best not to put more than 2 tomatoes or peppers per pot. Use bamboo stakes or wooden dowels to stake the plants using a twist tie to hold them to the stakes.

10. Pollination of Vegetable Plants:

- a: **Tomatoes** require pollination to be productive. If outdoors, bees, wind, and certain insects will pollinate tomatoes. However, a small pollinator (\$19.95) will help you produce larger fruit. It is only necessary to pollinate every other day. Simply touch the hand that holds the flowers briefly with the pollinator or shake the plant lightly every couple of days.
- b: **Peppers** are self-pollinating to a degree. However, bees and wind also helps. If indoors, shaking the plant quickly will aid in pollination. Certain chile type peppers do very well in this system but larger bell pepper types may take up too much space. Small eggplant such as Black Beauty even do well.
- c: **Strawberries** are also self-pollinating to a degree. However, they will do much better if mechanically pollinated, by hand or wind. Outdoors, honeybees do an excellent job. Indoors, bumblebees do an excellent job. However, hobbyists normally do not use bees. Shake the plant briefly or use a small air blower such as a hair dryer. A pollinator will also work on strawberry plants. Hold the pollinator lightly behind the base of the flower for a few seconds. If you do not wish to go to this trouble the strawberry plant will produce a reasonable amount of berries without any mechanical pollination or bee pollination.
(See separate guide for ordering, planting and growing strawberries)

11. **Direct Seeding vs. Transplanting:** Direct seeding into the system is easy, but growth time in the pot is longer. Lettuce and certain herbs do well by direct seeding. Slow starting plants such as tomatoes, peppers, spinach and strawberries do better from plugs. Experiment on your own to determine which method is best for you. (If you buy a plant be sure to check it for insects and molds, wash leaves with a mixture of vinegar and Hydrogen Peroxide)

12. **Lighting and Temperature:** These are the most important factors that plants need other than proper nutrition and water. Too much or too little light (or heat) decreases the productivity of plant growth and the quality of fruits and vegetables. The ideal night temperature is 58-62°F . However, a range of 55-65°F is sufficient. The ideal temperature during the day is 80°F . A range of 72-88°F is sufficient. Many plants are stressed below 55°F and above 90°F . Too much shade is usually more detrimental than too much light. Do not put your vertical garden under a tree or against your house. Plants need 7-9 hours of light every day depending on the plant species. The best way to reduce light is with shade cloth. A very attractive white knitted shade cloth can be used by hobbyists. This shade cloth is available in 20-40% shade. Shading is the best way to reduce temperature. Shade reduces the air temperature and plant temperature. Shade should only be used when it is too hot or too bright during the summer. If you have to grow in a shady area, lettuce and herbs and many green plants.

- 13. Indoors or outdoors:** There is no substitute for natural outdoor light. Patios and enclosed pools will be fine if not too shady. A greenhouse gives the ideal climate. The **Verti-Gro** unit can be used indoors or outdoors. Depending on the length of your outdoor growing season, you may want to experiment with a sunroom or a high light south facing window for indoor extension of you season.
- 14. Hydroponic vs. Organic:** Any organic growing media can be used in the **Verti-Gro** pots. The length of watering time should be reduced to as little as once per day for one hour when plants are small to 2 times per day for one hour when plants are large. Coconut fiber can be added to any organic growing media to increase drainage as well as water and nutrient retention.
(Please refer to separate bulletin)
- 15. Insects and diseases:** Insects and diseases are serious problems if not detected or left untreated. There are many books and guides for identification and control of vegetable diseases and insects.
(Please refer to separate information)
Our document “*Good Bugs, Bad Bugs*” for \$15.00 is well worth having.
- 16. Growing media (or synthetic soil mixes):** Coconut fiber in compressed blocks has become a very inexpensive and clean organic growing media. It may be used in the **Verti-Gro** system without any addition of perlite. Adjust watering cycles as in 14 above.
Please note that coconut fiber is an organic base but does not contain usable organic fertilizers.
(Please refer to separate instructions)