

ACCESSORIES

General Hydroponics offers many useful products to support your RainForest Model 36 system. These include:

Controller—for interconnecting many planters

Advanced Nutrient System: FloraMicro, FloraGro & FloraBloom

Growing Cups and Covers

Hydroton®

pH Test Kit and pH Control Kit

Digital electronic pH, ppm and temperature meters

Meter calibration solutions

pH Adjustment Solutions

WaterFarm—for growing large plants



**GENERAL
HYDROPONICS®**

Bringing Nature and Technology Together
Thank you for selecting the RainForest Model 36 modular aero-hydroponic system. Please send any comments or suggestions to:

PO Box 1576, Sebastopol CA 95473
Phone 707 824 9376
Fax 707 824 9377

We're open from
9 am - 4:30 pm PST
Monday thru Friday

Please visit our web site at:
www.generalthydroponics.com
for further information and also for our full line of hydroponic systems and nutrients.



RainForest 36

Congratulations on your new RainForest Model 36 modular aero-hydroponic system. This system enables you to rapidly and successfully root cuttings and germinate seeds. Once rooted you can transplant to any growing system like the General Hydroponics WaterFarm. You will be amazed by the kinds of plants that can be propagated from cuttings using the RainForest. These include even the most difficult fruit and nut trees, ornamental shrubs, vegetables, and flowers - many of which have never been propagated from cuttings before. Of course, easily propagated plants will root quickly and grow phenomenally in the RainForest. The RainForest secret is the patented aero-hydroponic method of delivering the nutrient solution. Oxygen-charged nutrient solution is sprayed through the air onto the cuttings, seeds, and newly formed roots. This oxygen-rich nutrient solution constantly circulates within the RainForest reservoir, so that a lot more oxygen reaches the root boundary zone than with other hydroponic systems. The roots absorb optimal



levels of both oxygen and nutrients, so that the entire plant thrives. The RainForest Model 36 is at the cutting edge of technology with technical features to satisfy professional growers and scientific researchers, and a simplicity that makes it ideal for hobbyists, as well.

Your RainForest Model 36 consists of the following components:

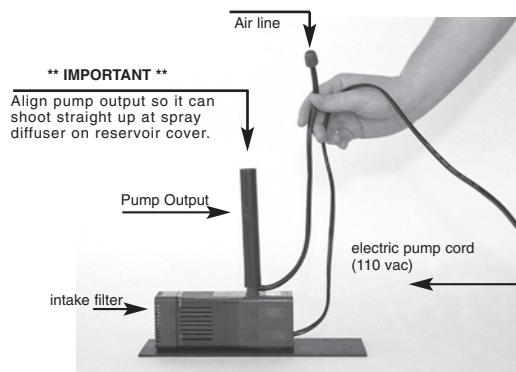
- Reservoir container with drain/level tube indicator
- Motorized spray pump
- Reservoir cover (with 6 plant sites)
- Six growing cups and cup lids
- Hydroton and polywool
- Flora Series Nutrient Kit



cup with Grorox and polywool for starting seeds.



cup with lid for rooting cuttings.



Pump assembly sits inside reservoir container

TROUBLESHOOTING

Sympton: Wilting

Cause: Excessive heat

Remedy: Move to cooler location

Cause: Excessive cold;

Remedy: Move to warmer location

Cause: Low humidity

Remedy: Mist plant foliage regularly

Cause: Low water level

Remedy: Add water for proper aeration

Sympton: Yellowing:

Cause: Low sunlight

Remedy: Move unit or add supplemental lighting

Cause: Exhausted nutrient

Remedy: Drain and renew nutrient solution

Sympton: Nutrient isn't getting to roots

Cause: Pump is not working properly

Remedy: Make sure that nutrient is above the "low" level mark and that the pump is not clogged. Check the plug and electricity source. The pump rarely fails completely. If it is damaged (for example, from operating dry), you can replace all its moving parts with a General Hydroponics Pump Rebuild Kit. To disassemble the pump, remove the intake elbow, then rotate the impeller housing on the pump 90 degrees clockwise and pull it off the pump body. Pull out the impeller assembly and spin it on its shaft to make sure it spins freely and does not wobble. If it does wobble, the assembly must be replaced. This usually occurs only if the pump has been running dry.

Sympton: Various signs of plant disease (only one of the six plants may show symptoms)

Cause: Infected plant

Remedy: Extract the diseased plant intact by pulling the pot. If necessary, lift the motor housing to collect infected roots through the opening. Discard the plant, disinfect and rinse the pot, replace the nutrient solution and start with a new seed or cutting.

Sympton: Discolored leaves, leaf-tip burn, deformed young leaves

Cause: Deficiency or toxicity

Remedy: Discard nutrient solution, rinse roots with tap water and use distilled or purified water to mix fresh nutrient solution

Sympton: White buildup on support foam in pot holders, on top of unit and on underside of lid

Cause: Salt deposits resulting from excessive nutrient strength or heavy mineral/chemical content in water

Remedy: Use distilled or purified water

PLACEMENT:

Light & Temperature

Abundant light, proper temperature and adequate ventilation are crucial to the fast growth, healthy plants and higher yields made possible with your RainForest Model 36. Remember that, while your system provides plants with proper nutrition and water, plants need adequate light to flourish.

Seedlings and cuttings generally develop faster when the nutrient is warm (70-75° F). Keep the RainForest in a warm room or place the reservoir on a small electric heating pad. The RainForest should be placed in bright, indirect sunlight or directly under color-corrected or sunlight-simulating fluorescent lamps. If you are using artificial lighting, set the light timer to simulate a normal day/night cycle. Note: Young seedlings are delicate: Avoid direct sunlight or high-intensity artificial light.

OPERATION

If you are using a timer for the RainForest motor, connect and set the timer and plug in the spray pump. For sprouting seeds, it is preferable (but not required) to run the RainForest motor one hour ON/one hour OFF. For starting cuttings, the motor should be ON 24 hours per day.

Once roots extend into the nutrient solution, you can use the timer to run the motor intermittently—either one hour ON/one hour OFF, or ON during the day and OFF at night. If the motor is OFF during darkness, set it to turn ON for one hour halfway through the night.

NUTRIENTS

For seedlings and new cuttings, we recommend filling the reservoir with purified or distilled water and adding no nutrient until roots begin to develop. When roots appear, use very mild nutrient solution. As the root system grows larger, increase nutrient strength cautiously. For vigorously growing plants with fully developed root systems, use a normal strength nutrient solution of 1,000 ppm with a pH of 5.8 to 6.5. Avoid strong or aggressive nutrient solutions. Excessive nutrient can do more harm than good!

As plants consume water, the water level in the reservoir will drop. Top off the system with pure water or very mild nutrient on a regular basis to maintain the level between the upper and lower marks on the drain/level tube.

Completely drain exhausted nutrient solution and refill with fresh nutrient every two weeks. If nutrient consumption exceeds 1/2 gallon per day, drain and replace solution weekly.

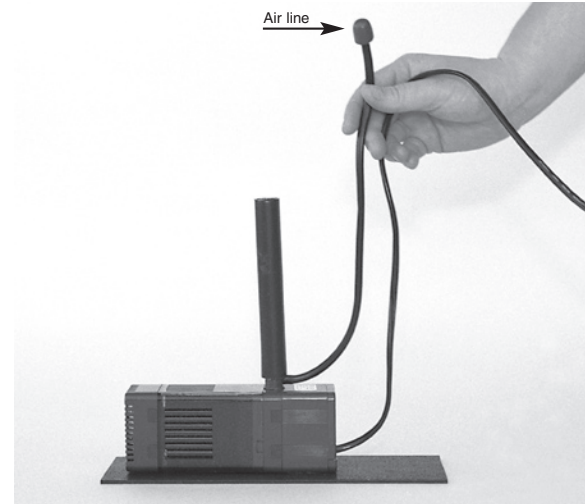
Water quality can profoundly affect plant growth. If your tap water is “hard,” use distilled or purified water for mixing nutrient solution. Avoid mineral or “spring” water; the minerals in this water can damage your nutrient solution.

CLEANING

From time to time, clear nutrient deposits and bits of plant matter from the pump intake filter.

Between crops, drain and dismantle the RainForest system. Disinfect the reservoir, drain/level tube, cups, lids, spray pump assembly and GROROX with a dilute chlorine bleach solution (1/2 cup bleach per gallon of water). Rinse well and reassemble.

Assembling your RainForest



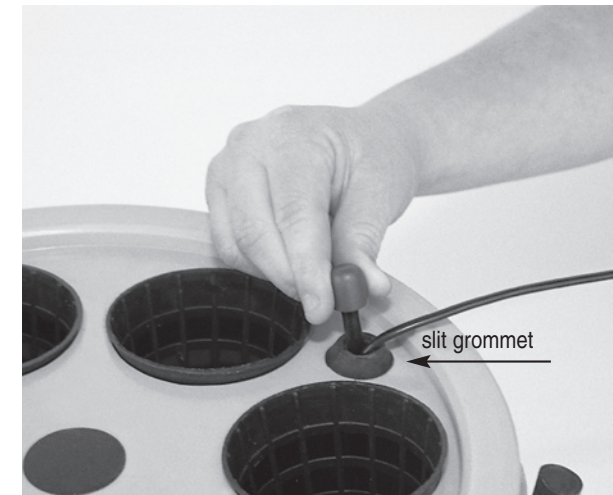
Connect air line tube to pump as shown.



Place pump assembly inside reservoir. The pump output should point straight up so that the spray hits the spray-diffuser under the center of the reservoir cover.



Snap the reservoir cover onto reservoir. Guide pump electrical cord and air line tube into the slit in the lid. Slide the slit grommet around the air line tube and electrical cord.



Press the slit grommet into the hole in the lid. The air line tube and electrical cord should now be securely locked in place. The airline tube must be above the lid in order to properly aerate the nutrient solution.

Planting your RainForest

Seed Propagation

1. Fill each growing cup almost to the top with Hydroton that have been "conditioned" in tap water.

2. Place seeds on the Hydroton as you would plant them in the ground. Cover the seeds with a layer of Hydroton. Larger seeds should be planted deeper and smaller seeds should be planted closer to the surface. Place very small seeds on a piece of fine nylon netting, or other non-absorbent support, just under the surface of the Hydroton.

3. Insert the cups firmly into the holes in the reservoir cover. To slow evaporation of the nutrient solution, cover any unused holes.

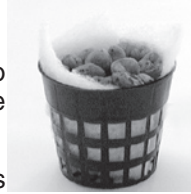
Cutting Propagation

1. Put a cover on each growing cup, and poke a pencil through the cover holes to loosen any tight hole flaps.

2. Trim each cutting so that 3 1/2 inches can extend below the cup cover (through the bottom of the cup and into the nutrient solution) and a few inches (containing several leaves) can extend above the cover.

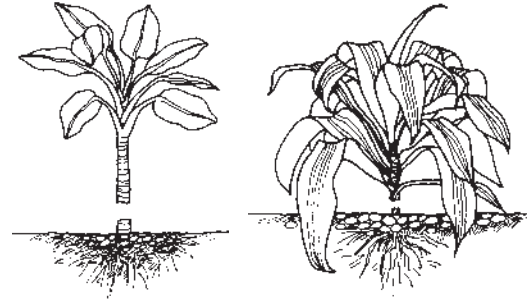
3. Insert the cuttings into the cups, making sure that they are well separated where they pass through the cup bottom. The first roots will form at the lowest node on the cutting, which must be submerged in the nutrient solution.

4. Insert the cups firmly into the holes in the reservoir cover. To slow evaporation of the nutrient solution, cover any unused holes.



Cuttings

The RainForest Model 36 provides the best possible medium for propagating cuttings. Rooting in the unit is fast and root growth is vigorous. The RainForest Model 36 enables you to grow just about any plant from cuttings, but in order to achieve maximum potential, it is critical to take cuttings intelligently.



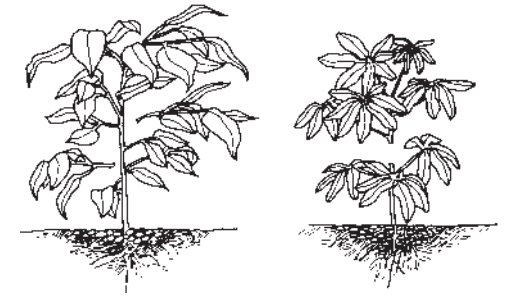
Illustrations 1 & 2.

Single-stem plants, such as Dieffenbachias or Craceanas, are propagated from stem or cane cuttings. Select a point on the stem where the diameter is less than 1 1/2 inches, so your cutting will fit all the way down into the growing cup. Make the cut just below a leaf, a place where a leaf has been attached, or between two rings on a cane.



Illustrations 3 & 4.

Multi-branch plants can be cut by using a sharp knife or razor and cutting flush with the main stem at a 45 degree angle. Never use scissors. No other foliage need be removed. In fact, the plant will probably maintain buds or blossoms while putting out new foliage in the RainForest Model 36 system.



Illustrations 5 & 6.

Large cuttings may be taken from many plants, including the weeping fig (*Ficus benjamina*) and the Schefflera (*Brassaia actinopylla*) by cutting part or all of a branch of stem (with a maximum diameter of 1 1/2 in.). Top-heavy cuttings can be

supported with a dowel inserted into the growing cup until their root systems develop sufficiently.



Illustration 7.

Multiple cuttings can be obtained from most weeping or cascading plants such as Hoyas

(*Hoya carnosa*), climbing Philodendron (*Philodendron scandens*) and Wandering Jew (*Zebrina pendula*). Make cuts at the desired lengths. Remove foliage and flowers from 4 in. of

the base and insert one or several cuttings into a single growing cup.



Illustration 8.

Root division is the method for propagating plants such as the Peace Lily (*Spathyphyllum wasisii*) and Cyclamen

(*Cyclamen persicum*). Cut vertically through tubers with good foliage growth and some roots. Thoroughly rinse any soil off roots, then remove any broken or damaged roots with a sharp knife.