

Garden & Greenhouse

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Verti-Gro Vertical Gardening & Hydroponic Growing Systems

by Eric Hopper

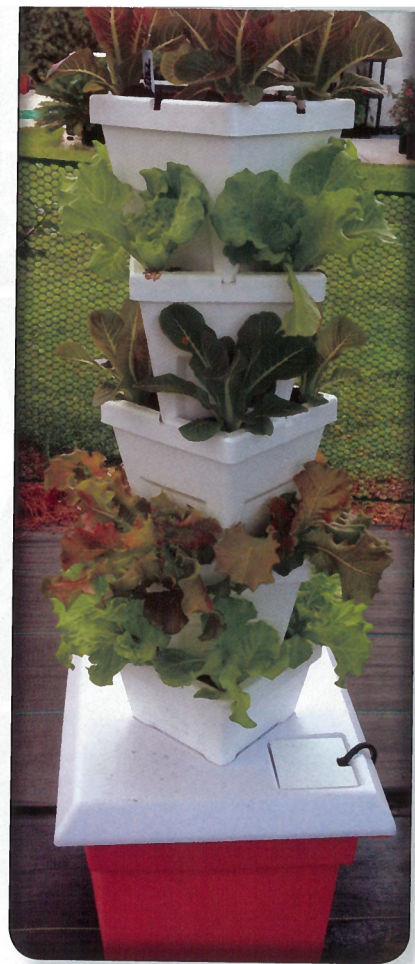


Physical space is a limiting factor to any garden's production and therefore must be carefully planned. Whether a garden is on a windowsill or in a 5,000 square foot greenhouse, there is only so much floor space that can be filled. By implementing vertical growing techniques, a gardener can efficiently and effectively utilize his or her floor space. Vertical growing is exactly what it sounds like: growing plants upward. When using vertical growing techniques, a horticulturist automatically makes a more efficient use of the given floor space by maximizing the garden's production potential. There are many different ways a grower can utilize vertical growing techniques. Some growers implement trellises, teepees, or other structural supports. Vertical hydro-

ponic systems are also becoming more popular as a way for growers to not only maximize floor space but also gain the other production benefits of a hydroponic system. There are a few vertical hydroponic systems available to consumers but none compare with the versatility and innovative designs of the growing systems offered by Verti-Gro. The heavy duty insulated growing container by Verti-Gro is guaranteed 5-10 years depending on its application.

Verti-Gro is a Florida-based company that specializes in vertical growing systems for every type of gardener; from the home hobbyist to the commercial grower. The factors that struck me as most impressive were the design, quality craftsmanship and versatility of Verti-Gro's vertical hydroponic growing systems. These systems are designed to maximize





growing space while minimizing water usage. The quality materials used in the construction are built to last and even help to insulate the plants' root zones. Verti-Gro offers multiple pre-made systems which gives the horticulturist enough options to find a system that suits his or her needs. These systems are straight-forward to set up and operate. Verti-Gro offers recirculating systems or drip-to-waste systems. However, the drip-to-waste has very little waste due to the use of a very accurate water proof timer that allows the towers to feed automatically up to 10 times per day in one minute increments. The drip from the towers is caught in a larger "ground pot" whereby larger plants can be grown to use up any excess water and nutrients. A closer look at a few of their most popular systems can give some insight into which Verti-Gro system is a good fit for your garden space. Weeds are no longer a problem since a commercial weed control fabric is supplied.

The One Stack Vertical Garden (VG-1)

Growing flowers or vegetables in a Patio Garden has always been a popular and rewarding pastime. Verti-Gro now offers a completely automated indoor or outdoor vertical garden. The One Stack Vertical Garden (VG-1) is a stand-alone, re-circulating vertical garden system that is perfect for growers with limited space or for those who want to experiment with vertical gardening techniques. This system is automated which means the pump within the reservoir is run by a timer and the gardener never has to hand-water the plants. All the gardener has to do is make sure the reservoir has a

sufficient amount of nutrient solution and the system takes care of the rest. The One Stack Vertical Garden consists of five growing pots mounted directly above a water reservoir. This system takes up a minimal amount of floor space for the amount of growing space it produces and is perfect for both indoor and outdoor use. The One Stack Vertical Garden is built to last a lifetime and is guaranteed for 5 years. This unit has been on display at EPCOT "Behind the Seeds" for over 12 years and is available in 3 colors.

The 16-Pot Automatic Vertical Garden Kit (VGK-16AGP)

The 16 Pot 64-plant Automatic Vertical Gardening Kit is Verti-Gro's main stream garden. This kit is ideal for hobbyists who are serious about implementing vertical growing into their gardens or greenhouses. As its name implies, this kit starts with 16 pots separated into four columns of four pots each. This system needs to be connected to a reservoir and is capable of full automation. The 16 Pot Automatic Vertical Garden Kit comes complete with four columns but allows for expansion at any time. Verti-Gro even offers special expansion kits for gardeners who wish to expand their vertical garden systems. Each of the columns in the 16 Pot Automatic Vertical Gardening Kit includes a ground pot for additional larger plants. This kit has everything the grower needs to get started, including pumps, timers and PVC connections, grow media, ground cover, nutrients, detailed instructions and more. The grower just needs to add a reservoir to the kit and the system is ready to roll.

The 32-Pot Automatic Vertical Garden Kit (VGK-32AGP)

The 32-Pot 128-plant Automatic Vertical Garden Kit is essentially the same kit as the 16 Pots Automatic Vertical Garden Kit, only doubled. This kit comes complete with eight columns each equipped with four pots and a ground pot. Once the gardener provides a reservoir, this kit is ready to start growing. The 32-Pot Automatic Vertical Garden Kit is perfect for a hobbyist or small farmer who wishes to maximize his or her growing space with a vertical growing system.



systems for any size commercial application. The Verti-Gro towers can be installed almost anywhere where light is available. Indoors, outdoors, rooftops and patio or it can replace your existing garden in up to 10 times less space and also save up to 10 times less water.

Throughout my dealings with various hydroponic and greenhouse companies, I have been privileged to examine and test some impressively innovative products. The vertical gardening systems by Verti-Gro were products I really got excited about researching and examining closer. It is obvi-



Being completely automated, this kit is easy to use which equates to more free time for the gardener and also peace of mind in knowing that the plants are being fed at optimal times.

Commercial Systems by Verti-Gro

There is no doubt that Verti-Gro manufactures very high quality vertical growing systems for the home gardener and hobbyist but they also create these same quality systems for commercial growers. One of their commercial systems, the VGO-500L5, is a 500 pot vertical growing system capable of holding 2,000 plants in vertical towers and up to 500 in ground collection pots. The production potential of this system is simply incredible. From 2,000 pounds of strawberries per season to 2,000 heads of lettuce per month, this system is built for serious production. This 2500-plant system can be easily converted to a 5000-plant system. The possibilities are endless with Verti-Gro's commercial systems. Verti-Gro offers different sized systems for different crops, which allow the possibility of tomatoes, peppers, strawberries and cucumbers to be integrated into a commercial system from 200 towers 4000 towers per acre. Verti-Gro also offers customized systems for large-scale gardens and will gladly quote



ous to me that a great deal of research and development went into designing Verti-Gro's various vertical growing systems. What is really impressive to me are the larger, customizable systems that can be easily tailored to fit the needs of the horticulturist. Maximizing production with vertical gardening techniques is something that many professional horticulturists have been doing for some time. When a company like Verti-Gro steps up and designs straight forward and highly effective pre-built systems, they open the door for hobbyists and commercial growers to enter the realm of vertical growing. Horticulturists of all skill levels and garden dimensions are now able to transform their growing spaces into highly efficient, productive vertical gardens. The high-quality craftsmanship combined with the company's outstanding customer service makes Verti-Gro the best choice for hydroponic vertical gardening systems for any home gardener, greenhouse hobbyist, or commercial horticulturist. **GG**

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For more information contact Verti-Gro at 352.347.9888 or visit Vertigro.com and [Facebook.com/verticalgardens](https://www.facebook.com/verticalgardens).

Growing Hydroponically on a Budget

by Jeff Sanders

When we think about growing plants hydroponically, the first thing that often comes to mind is first needing to buy a lot of expensive equipment and nutrients. After all, if you have ever been in a hydroponics supply store or looked up stuff online, and then started adding up all the money you need to spend to get started growing some plants, it can seem expensive as well as overwhelming. But growing plants hydroponically doesn't need to be expensive. In reality it can even be cheaper than growing them in soil.

But how is that possible when everything is so expensive? You simply don't need all the bells and whistles to grow hydroponically. The same way you don't need a \$250,000 car to drive to work every day either. That's fine if you have the money, but many of us don't. However for a new hydroponic grower it can be a challenge to figure out what's necessary, and what isn't. While there are basic things you need to check and be aware of to grow plants successfully, it doesn't need to cost much to do so.

Checking pH

While you do need to know and be aware of pH and nutrient concentration levels, you simply don't need to buy any electronic pH or TDS/PPM meters to do so. Not only that, electronic meters need constant care and calibration. Even then they can still give you false readings. To test pH simple pH test drops work well and only cost \$8-\$9. They are easy to read and don't need special care, they also won't give you false readings. The best value for pH adjusters (pH up, and pH down) to adjust the pH within range, is dry powders/granules. The liquid ones work fine, but your mostly just paying for water. A little goes a long way with the granules and one pound of each will probably last a year or so.

Checking EC/TDS/PPM

While some will argue that you definitely need to buy a EC/TDS/PPM meter to check your nutrient concentration with, that's not the case. A half way decent one will cost around \$100 and I would rather buy a lot of nutrients to grow a lot

of plants with that money instead. A TDS/PPM meter might be nice to have if you have money, but it isn't mandatory, especially for a new grower.

You do need to know and be aware of your nutrient concentrations; however that's really simple to do without an electronic meter. Any nutrient manufacture will have a chart or be able to tell you how much to use for a full strength nutrient solution. That's really all you need to know and from there you can dilute them if necessary. There are charts online for EC/TDS/PPM that give ranges for specific plants.

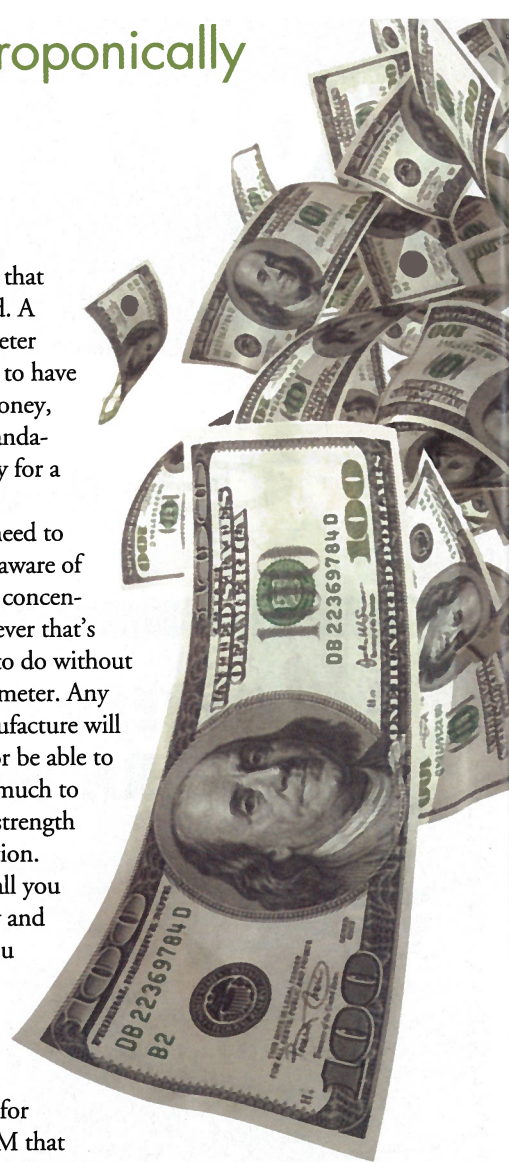
If you look at those charts, you will notice some have higher numbers (concentrations) than others; those are heavier feeders than the plants with the lower numbers (concentrations). If your plants are heavier feeders, keep the nutrient solution close to full strength, if they are light feeders, then dilute it a little.

Now with all that being said, don't get stuck on the numbers. The EC/TDS/PPM charts are just a general guide. There are way too many variables like temperature, humidity, lighting, plant size, stage of growth, etc. that will affect how plants take up nutrients. So any EC/TDS/PPM range is simply nothing but just a starting point suggestion.

Simply look at your plants on a daily basis, particularly the new growth. If the new growth starts to look yellow instead of nice and green, add a little more nutrients to strengthen the nutrient concentration. If all the new growth begins to come out looking distorted and curled, just dilute the nutrient solution with plain water to reduce the nutrient strength.

Buying Hydroponic Nutrients

Like when you buy a printer, it's not the cost of the printer that gets you, it's the cost of the ink you need to buy for it to continue to work that gets you. Visit any hydroponic supply



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store in person or online, and you will see a wide array of different nutrients and additives for sale. While most of them will work just fine, they're not very cost effective. When you break it down to per gallon, some of them can even cost as much as 30 to 40 cents per gallon of nutrient solution. Even a small 10 gallon reservoir would cost you \$3 to \$4 every time you change the nutrient solution at that rate. Change it once a week, that's \$12 to \$16 a month.

Fortunately there are manufactures that sell "cost effective hydroponic nutrients". One thing all cost effective nutrients have in common, is that they are dry (not liquids). Liquid nutrients are about 10% nutrients, and 90% water. Water takes up a lot of space, and costs a lot to ship to stores.

While the cost per gallon varies from manufacture to manufacture, and by the quantity you get. You can buy hydroponic nutrients for between 10 cents down to as low as 1.6 cents per gallon of nutrient solution. Just because they are less expensive, that doesn't mean they are less effective or low quality. They are just as good as the high priced nutrients on the store shelves at the hydroponic shop. And you really don't need to buy a bunch of additives either. Hydroponic nutrients contain all the macro and micro elements your plants need for healthy growth.

Hydroponic Systems

Here you could easily spend a small fortune as well if you bought commercially built hydroponic systems from the store. But you could just as easily save that fortune and build your own systems for a fraction of the cost of commercially built systems. Building your own hydroponic systems is really easy to do, and there are actually only six types of hydroponic systems; Drip system, Ebb & Flow (also called flood & drain), NFT

(nutrient film technique), Water Culture (often called DWC), Aeroponic, and Wick systems. Each type of system works a little differently, but the concepts of all of them are simple and easy to understand.

You can build any type of hydroponic system using almost anything, including common every day materials like PVC tubing, buckets, storage totes, vinyl tubing, standard garden irrigation supplies, ADS (advanced drainage systems) tubing, vinyl rain gutters, vinyl post covers, fountain and pond pumps, aquarium air pumps, etc. You can find everything you need at just about any hardware store, as well as in many department stores. You may even have many materials lying around, or be able to recycle things other people are throwing away. I love to use things people are throwing out, it doesn't cost anything, and it saves it from the land fill.

Using Artificial Lights

When people first hear about hydroponics, often times they think it means growing plants under artificial lights. But the term hydroponics has nothing to do with using lights. The definition of hydroponics is simply "growing without soil." New growers really don't need an expensive light system, or high energy bills to grow plants hydroponically. If you can grow plants in soil, you can grow them hydroponically using the same free natural sunlight. Even during winter months you can take advantage of natural sunlight by growing in a greenhouse.

However if growing your plants with natural sunlight just isn't possible, then artificial grow lights are necessary. You can always maximize their effectiveness by surrounding your growing area with reflective surfaces to bounce the light back toward the plants for better coverage on the plants foliage. For most

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fruiting plants the more expensive HID and/or LED lights are best. But if your growing non-fruiting plants like lettuce or herbs, you can use much less expensive fluorescent lighting. Just don't skimp on the overall wattage, and make sure the plants get good coverage.

If you want to know how much it will cost in electricity to grow your plants with artificial lights, you can estimate the energy cost to run a light system with an online "energy cost calculator." Just fill in the amount you pay per kilowatt hour (found on your electric bill), and the total wattage of your lights, and how long you plan to run it each day. Then multiply the total you get for one day by 30, and that's your estimated monthly energy cost to run the light system.

Growing Medium

While hydroponic growing mediums aren't really very expensive, depending on the type of hydroponic system your growing in, and how much root space your plants need, you may still need to consider the cost, and some are less expensive than others. As an example you may be using 5 gallon buckets, and have 4 of them to fill. That would be about 20 gallons of growing media. That could get expensive. In a case like that I would gather a bunch of rocks (for free from my back yard), and clean and sanitize them by washing them off with the hose on the driveway, then soaking them in bleach water a few hours (or overnight), and rinsing them off again.

Then fill each bucket about one third of the way with the rocks, and fill the buckets the rest of the way with my favorite growing media coco or coir/chips. One 2.5 cubic foot block



should be enough, and will cost only about \$12. Then you have 20 gallons of growing media with good water retention, good drainage, for about \$12 total. Some other easy to find low cost options are Perlite, Vermiculite, River rock, Pine shavings (hamster/horse/pet bedding). Any of these can easily be used by themselves or mixed together. **GG**

Jeff Sanders runs a hydroponics website called www.HomeHydroSystems.com to help hydroponics enthusiasts learn how to build their own hydroponic systems, as well as learn about many topics related to hydroponics so they can grow to their own crops successfully. He is a hydroponic gardener and enthusiast with over 7 years of experience growing hydroponically. He is also currently building a small commercial hydroponic greenhouse to grow live fresh herbs to sell in his local community. You can contact him through his website and at homehydrosystems@yahoo.com.

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