THE GROWERS UNDERGROUND

GROW ROOM TIPS and TACTICS

Advanced Nutrients

Growers' Underground Tips and Tactics that Give All Levels of Growers Bigger Yields Right Now

Dear Grower:

You're obviously a person who's into finding the best hydroponics information, tools, and techniques because you want the most from your hydroponics gardening.

That's why I've taken my 30 years of hydroponics gardening industry experience and distilled it into this valuable special report that you can immediately put to use in your garden.

From cloning to flushing and everything in between, I'm divulging answers to your hydroponics questions, as well as important information you might not have heard before, that'll help you get the most from your gardening.

So let's start with a topic that growers focus on: successful **cloning and germinating**.

First of all, let's make certain you are cloning or germinating the right plants. Too many growers see cloning as just an easy method of propagation, and not also as a method to make certain that you have the strongest, healthiest plants that you can possibly have.

Please pay very close attention to the quality and characteristics your plants and only clone the most superior performers. You're looking for motherplants with traits such as larger roots, faster growth, disease resistance, denser structure, and larger yields of more potent flowers. Pick the plants that are the most valuable to you.

An important **cloning** fact to remember is keep leaves moist, especially during the first week after taking the cutting. There are various methods for doing this, including using pre-made cloning tents, domes and systems. Some of the cloning systems have air exchange, pumps, lights, reflective material and other features that make cloning almost automatic.

Spray your cuttings' leaves with a mild nutrient, Vitamin B's and a potassium silicate protectant; leaves absorb nutrients through their stomata.

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After you have taken a cutting, you have to dip it into rooting hormone powder or gel so that it seals off, is protected, and can quickly sprout roots. But there are common mistakes growers make that affect how well the powder or gel performs.

For example, some growers unwittingly place foreign materials in their rooting gel or powder. This most often happens when growers try to replace spilled powder or gel in an attempt to save money.

Problem is, introducing dirt, leaves, or other foreign materials into your rooting gel or powder can feed nasty microbes that harm roots and destroy the gel or powder.

So make sure not to put foreign materials into your gel or powder and to store it in a cool, dry place with the lid on tightly after each use.

Another problem comes from not using enough powder or gel at the base of the cutting. **You want to coat the entire section of the stem that enters in the growing medium.** Many growers try to be stingy, only using a very small amount the very bottom of the stem. Unfortunately, this won't be quite as effective, and it might not increase the cloning success rate to your desired level.

Being more generous with rooting powder or gel ensures that the hormones are actually absorbed into the cutting so it sprouts roots more quickly.

Something most growers forget is that if you don't have a healthy mother plant, even the most potent rooting powder in the world isn't going to help you form roots faster.

Making sure that your mother plant is well-fed is a major step towards making certain that your cuttings take root.

Two things that hydroponics experts often use on their mother plant are Vitamin B and carbohydrates. The B vitamins cut down on stress, which makes the cuttings faster rooting. And the carbohydrates give your cuttings large stores of energy, which can increase survival rates.

Recent research proves that cloning gel is more effective than powder. Using cloning gel

increases your cloning success rate. Look for cloning gels that contain vitamins and hormones specifically designed for faster rooting because the faster you are able to get roots to form, the closer that you can get to a one hundred percent success rate for cloning.

Look for a cloning gel that comes with a handy applicator tip that prevents contamination and waste.

Some growers put heating pads underneath their clones because heat can stimulate rooting activity. The recommended temperature setting for a root heating mat is 72-76 degrees F.

For thick, sturdy cuttings, root them under T5 high intensity fluorescent bulbs. These are ideal for all early plants, including clones, transplants and seedlings. We'll talk more about lighting later.

Many plant scientists and connoisseurs feel that modern hydroponics growers rely too heavily on cloning and forget about **the advantages of growing from seed.**

If you look at seed banks you realize the many incredible varieties of plants you can seed-grow that are not available to you as clones. There are more varieties of seeds than you can imagine, and many of them are tasty and unique.

Growing from seeds helps establish the genetic survivability of plants and also gives you a wider palette of plant experiences to choose from.

You also get the joy of using male plants to pollinate females so you can create your own unique varieties of plants that nobody else will ever have.

Professional, true-breeding genetics can often be expensive and are sometimes shipped from faraway countries. Thus it's important create optimal conditions for germination, which in some cases is even more difficult than taking cuttings.

One of the trickiest problems to solve during germination is how much water the seeds are exposed to. People used to recommend that you germinate seeds in water or wet paper towels, but this creates needless hassle for the seedlings and for you.

Rockwool, coco pucks and peat pots are popular choices because you want your seeds in a moist environment, but not *too* moist.

The most favorable temperature for germination is not the same as the most favorable temperature for established plants or seedlings. In general, germination temperatures between 70 and 80 degrees F are best.

You must be cautious having sprouted seedlings under too much stress from high temperatures or too much light. You want the temperatures for sprouted seedlings to be about 76 degrees F.

Another tricky aspect is that genetics that are meant for colder northern climates might need lower germination temperatures when compared to genetics from tropical zones.

Here are some other factors influencing seedling development:

Oxygen, C02 and air movement– It's very useful to have a small oscillating fan on its lowest setting to gently blow the seedlings after they have been alive for 2-3 days. This gives them a good supply of atmospheric nutrients, and it also strengthens their stems. Make sure also to ping the seedlings several times a day. Stressing their stems helps give them stocky stalks and keeps them from getting too tall or spindly.

Light is vital at all stages of plant development, and germination is no exception. Make certain that your seeds are not planted so deep within your medium that they do not receive adequate light. You have to carefully ensure that plants get enough light as soon as they sprout. Otherwise, they may stretch due to inadequate light, become spindly, and fall over.

It is best to use **T5 high intensity fluorescent** or white LED lights from the time of germination until the seedlings are about 2 weeks old, at which time you can put them under HID lights.

That being said let's talk about garden lighting. Despite the hype, LED's are not the answer. In the future they might provide enough light, at low cost, and be more efficient than what gardeners are using now. But they aren't ready for prime time yet.

That leaves you with fluorescent, metal halide (MH), and high pressure sodium (HPS) grow lights. One thing to remember is that if you are using MH or HPS, you want to keep your plants 30 inches from the bulbs.

Fluorescents are used for clones, seedlings, and as augmentation light during transition to flowering. You can get your plants pretty close to fluorescents, and I want to emphasize that you should only use T5 high output fluorescent bulbs, not regular types.

Metal halide garden grow lights are primarily used for the vegetative stage of plant growth, but some growers use them for a few days, with or without HPS, during transition to flowering when plants are switched to 12 hour cycles.

High pressure sodium lights are used almost exclusively during bloom phase. They duplicate the color of autumn light that plants would experience outdoors during flowering.

The considerations you give to your lighting include the heat they produce, whether you will vent them or otherwise cool them, how many watts you need, cost, and ease of use.

One thing I can tell you for sure, get MH or HPS lights with digital ballasts. These are relatively new ballast technologies that are a big improvement over the old-style ballasts that were too large, too loud and too hot. Some digital ballasts allow you to run MH or HPS from the same ballast or at the same time.

Please also note that there are constant upgrades in the types of MH and HPS bulbs. Scientists are also researching the light spectrum to see which color temperature will give the best light to plants in specific growth phases.

Ask your hydroponics store to explain to you the full range of lighting fixtures, bulbs, light movers and other lighting technology before you invest in lighting equipment.

Sweet-Smelling flowers are worth more…

You grow large, impressive flowers if you use the right kinds of fertilizers and supplements. But even if you get really large blooms, that is no guarantee that you will

also be rewarded with sweet smelling flowers. There's nothing more disappointing than discovering that while your flowers are large, they don't have a good enough aroma. That's why you'll want to find an aroma enhancer that contains the following ingredients:

B Vitamins - One of the main reasons you probably aren't getting as potent as a scent from your flowers as you would like is probably stress. Stress can be caused by a variety of factors, the most common is simply poor conditions in your hydroponics grow room. This is why a good aroma enhancer comes packed with a broad range of B vitamins designed to fight stress.

Besides reducing stress levels, B vitamins can also increase overall cellar activity, leading to superior scents and overall higher quality. You won't just notice bigger and more aromatic blooms, but overall healthier plants.

Sugars: Long before scientists ever perfected hydroponics formulas, growers used sugar as a method of sweetening the flavor of fruits and the aroma of flowers. These techniques can prove to be fantastically effective in hydroponics. So look for an aroma enhancer that has fast-acting carbohydrates that stimulate extra plant growth while at the same time providing your blooms with sugars necessary to increase overall aroma.

"Biomolecules" are special compounds have proven tremendously effective in increasing the overall aroma of flowers. Probably the most notable biomolecules are polyphenolics, terpenoids and anthocyanins. These substances, which can be found within some of the natural ingredients in the highest quality aroma enhancers, have a proven ability to increase not just the potency of aroma, but also overall quality.

A topic related to getting good aroma for your plants is getting your harvests to taste real good too. Perhaps you didn't realize that a lot of the nutrients you put in your plants are still there at harvest time. Also, unless you are using an expensive reverse osmosis water filtration system, water pollution is also storing itself in your crops. This affects taste and smell.

That's why you should flush your crops during their final phase of growth. You can remove all nutrient salts and pollutants. All it takes is the proper plant flushing product used during the last stages of growth.

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One big difference you will notice between plants that have been flushed versus those that have not is that flushed harvests taste better. Unflushed nutrients and toxins create a bitter taste that overwhelms the desired sugary tastes in your harvests.

You can also improve the aroma of your crops by flushing them. Pollutants and unused nutrients can build up and either dampen desired aroma or create a foul aroma. When you use plant flush formulas that contain the correct chelates in plant flushing products, you can totally remove all these salts, leaving only a natural sweet scent.

If you grow in a hydroponics garden for a profit, flushing plants needs to be worked into your budgeting and plans. A plant flushing product will pay for itself several times over because having fruits or flowers that smell and taste better make your crop a premium item. You can charge more for crops, telling your customers that they are free of agricultural and water-borne pollutants.

So that's good information about getting strong aroma and taste in your flowers, but what about **you getting very heavy harvests**? Here are some of the most crucial elements that need to be in place before you can really enjoy a heavy harvest…

A lot of growers ignore the vital importance of **thicker stems** even though thicker stems obviously support larger flowers. If stems aren't thick or strong enough, then your plant just won't be able to bear the weight of huge flowers. Fortunately, there are tons of things that you can do to thicken your stems and ensure that your plant is strong enough to carry large flowers.

One of the easiest ways to increase stem size and strength is to just place a fan near your plants. The fan's breeze will cause stems to thicken.

One of the most important ways that you can create thicker stems on your plants is by using potassium silicate. This material affects your plants on a cellular level, actually increasing the strength of their cells while thickening them.

Potassium silicate has a lot of other benefits as well. Most notably, it protects your plants against disease. A good shot of potassium silicate from a reputable hydroponics company can help increase your plants defenses against mites, molds, and mildew. And less you have to worry about disease, the more you can concentrate on making your

stems thicker.

To get larger harvests, you need more than thicker stems that can hold the huge flowers up- you also need a denser, more efficient root mass. If your root development isn't sufficient your plant won't be able to soak up all of the nutrients that it needs in order to really thrive. Small, scraggly roots will never give you the heavy harvest that you want in your garden.

The good news is there are lots of techniques and supplements that thicken your roots and increase the odds of a heavy harvest. One popular root booster are beneficial bacteria that form a symbiotic web with your roots to make them stronger, bigger and more efficient. Look for liquid beneficial bacteria at your hydroponics store.

Along with your beneficial bacteria, add a carbohydrate formula that feeds the bacteria and also gives your plants quick shots of energy.

Now it's obvious that we're giving you easy to use information that you can apply to your gardening right away, but it's also good for you to understand how to get hydroponics information for yourself

As a hydroponics grower, you should make it a point to **discover new hydroponics information**. The more information that you have, the more equipped that you will be to reach that next level of hydroponics development. The wealthiest hydroponics growers usually make absorbing new hydroponics information a regular habit.

So where can you go to get hydroponics information?

The Internet has a large amount of information about hydroponics gardening, although not all of it is accurate. If you search for hydroponics topics, you will quickly discover countless websites that offer hydroponics information.

The best hydroponics manufacturers offer online tools that help you understand how to best utilize their products for your particular growing situation. If you can't find the information you want on a standard website, go to one of the hundreds of hydroponics forums, look for existing threads on your topic, or start a new thread. Pretty soon, you will probably find that lots of experienced growers have offered their advice.

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Of course when hydroponics first started to become popular, the only place you could ever really get good hydroponics information was your local hydroponics store. Many growers still rely on store personnel to gain knowledge. Just remember that some hydroponics store staff are biased because their stores have affiliate relationships with various manufacturers.

You always want to closely question the advice of a hydroponics store staffer to ensure it's solid advice, rather than advice just designed to make the most money for the store. Some hydroponics store staffers are expert gardeners. Some aren't. Make sure that the advice you follow isn't bogus advice.

And if you want to speak with other growers in your community, a local hydroponics store is often a place for hydroponics meet-ups, where growers get together to share information.

You can also get good information from magazines and newsletters. You probably already have a list of good magazines that provide useful growing information. Some hydroponics stores offer free hydroponics magazines, but be wary of some of the information in those magazines that may be biased in favor of big advertisers in those magazines. **A few hydroponics manufacturers offer free newsletters containing solid gardening information**.

Many hydroponic techniques are difficult to explain through words alone. Fortunately you can find DVD's and online videos that explain hydroponics gardening.

And here's a piece of information you might not be able to get anywhere else. Perhaps you're one of the growers who uses duct tape to affix white plastic onto the walls and ceilings of their grow rooms.

But did you realize that duct tape absorbs moisture. That means it eventually falls off, and it also provides a hiding place for molds and mildew.

Far better to use is plastic tape. This usually comes in red, white or yellow. Because it's plastic, it doesn't absorb moisture. It holds better and lasts longer.

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One of the biggest questions for hydroponics growers is **how do I get bigger flowers?**

To get bigger flowers, you need to use one of the most essential additives a grower can use; it's called a "bloom booster."

Many hydroponics manufacturers offer bloom boosters that are at best only crude combinations of phosphorus and potassium in the wrong ratios. These so-called boosters often caused crop problems that resulted in smaller harvests.

In recent years, the most innovative nutrients manufacturers have created bloom boosters that contain the correct ratios of phosphorus and potassium, as well as L-amino acids and other materials that make flowers larger, heavier and more potent.

Amino acids are among the building blocks of your plant's development, and they are often overlooked when it comes to getting huge yields. While there are lots of amino acids crucial for huge yields, the two that you need the most are L-tryptophan and L-cysteine. These amino acids have proved to be really effective in getting monster blooms.

Something every grower needs to know is that flowering plants need a lot more potassium than they need phosphorus. In fertilizer lingo, P and K stand for phosphorus and potassium. PK boosters have long contained the wrong ratio of phosphorus to potassium. New research has demonstrated that the blooming plants you grow need twice as much potassium as phosphorus. Look for a PK booster that complies with that fact.

You can also boost floral development and overall plant health by using humic and fulvic acids. These natural compounds contain rich components that speed nutrient intake, protect plants and encourage floral growth.

For **organic growing**, humic and fulvic are part of the menu. But it's interesting that most growers believe that hydroponics and organic growing are at opposite ends of the growing spectrum.

Hydroponic growing can only use synthetic elements and fertilizers, while organic only utilizes materials derived from all-natural sources. But what many don't realize is that

there can be some overlapping within the world of hydroponics.

In fact, many hydroponic growers make use of organic hydroponic nutrients. Organic nutrients such as guano, fishmeal, and earthworm castings have proven remarkably effective in hydroponics. You can easily find organic hydroponic nutrients combined in organic teas.

Here are some good reasons why you should consider organic hydroponic nutrients…

While synthetic hydroponics nutrients provide lots of benefits for your plants, you always have to be very careful about administering them because they can burn your plants through overfertilization.

Organic nutrients have less tendency to burn plants, in part because they are often delivered into soil root zones that act as a buffer against nutrient burn. In soil-free hydroponics gardens you don't have this buffer, so there is a much greater chance for making a mistake when using synthetic nutrient solution.

You can offset this risk, however, by using organic hydroponic nutrients. Organic nutrients are more likely to provide your roots the nutrients only in safe amounts. Nothing can replace good gardening techniques, but organic hydroponic nutrients can give you a little bit of extra safety.

One of the best organic hydroponic supplements you can use is beneficial bacteria. These microbes do a lot of things for your garden, including configure nitrogen into a form that is actually useful for your plants, and increase overall root mass. But your bacteria won't be quite as effective if it doesn't have sufficient resources that it can use to multiply and thrive.

To feed beneficial bacteria, you can use organic fertilizers that are loaded with bat guano, which can have a hugely impressive effect on overall plant growth, in addition enhancing bloom size and taste.

When using guano as a bloom booster, purchase guano that comes from fruit eating bats, because it is extremely rich in phosphorus, which is essential for the blooming phase of development. On the other hand, guano that comes form insect eating bats is often much

more rich in nitrogen, which is typically much more beneficial to the vegetative stage of growth.

Organic hydroponic nutrients give beneficial bacteria what they need. Bacteria thrive naturally in soil because there is so much natural organic material there. But there will only be organic material in your reservoir if you make sure to add it. Adding in organic hydroponic nutrients will make sure you get the most bang for your buck when you use beneficial bacteria.

When using beneficial bacteria, it is crucial to avoid using hydrogen peroxide, which kills beneficial bacteria.

There is some evidence suggesting that using organic ingredients even increases the overall nutritional value and weight of your fruits and flowers You may discover that your organically or partially organically grown fruits and vegetables have higher amounts of mineral, antioxidants, and vitamins.

As it stands, hydroponically grown produce is remarkably nutritious, but organic hydroponic nutrients can make it even more so.

If you go to your local farmer's market or grocery store, you probably have noticed that items slapped with an "organic" label sell for more than those that don't have it. The same works for items grown "hydro-organically."

If you use your hydroponic garden as a profit source, you can proudly boast that your fruits and vegetables were grown hydro-organically, and people will be more likely to pay higher prices for them.

It's good to realize you can get a complete blend of organic nutrients and still enjoy huge yields. If you look at quality organic nutrients teas, you will find ingredients like alfalfa meal for nitrogen, bat guano, and fish meal for a variety of nutrients and amino acids.

One of the most notable additions to the organic menu is organic B vitamin supplements. These often have the same kind of powerful, growth enhancing B vitamins that you can find in synthetic sources. Many growers also take advantage of kelp extract, which contains a pure blend or organic vitamins and hormones that help stimulate a great deal

of growth.

Another thing to realize, organic growing is safer for you and your consumers. Because safety is the highest priority, it's considered unethical to use chemical pesticides and herbicides on crops that are going to be consumed by humans. It's unfortunate that mites, fungi, molds, mildew, thrips, aphids and other pests attack your crops, but it's even more unfortunate if you poison your plants, yourself and your consumers by using chemical methods of defeating these attackers.

Obviously, an ounce of prevention is worth a pound of cure. You should make sure that you keep your grow room clean and vector-blocked to prevent unwanted bacterial or fungal growth and make certain that bugs don't have any routes to your plants.

Oh, and here's a little-known fact: paper-based and other regular duct tape used to tape reflective material to walls of grow rooms absorbs moisture, can attract mold and fungi, and often comes loose.

Use plastic tape, which usually comes in red, white or yellow, rather than paper-based duct tape.

If pests do enter your grow room, you might consider using a "pesticide" that uses citric acid or neem. It won't harm your plants, but it powerful enough to kill most small pests. For fungal diseases, you might try using plain old organic soap and water.

There are a variety of predator insects that attack insects that harm your plants. For example, spider mite predators feed on spider mites and their eggs. They breed twice as fast as the bad spider mites! Each predator feeds on about 5 spider mites a day, or 20 of their eggs.

Predators should gain control within 4 weeks, and then continue until the spider mites are nearly or completely wiped out later. The really good news is that the predators themselves disappear when the bad mites are gone!

Surprisingly, spider mite predators are this effective even through they're no larger than the spider mites, and sometimes smaller. Shaped a little more streamlined, they have longer legs that let them run faster, too. Attacking from the side, they suck the juices out

of their spider mite prey.

You can order predator mites and all kinds of other beneficial insects from various online stores, and some local hydroponics stores sell them too.

Another thing to consider about going organic is to start from the roots up. Instead of using rockwool or some other synthetic, consider using coco coir, which is made from coconut husks. Coco coir has many advantages, but you have to use special nutrients designed specifically for coco coir if you want to get the best results and avoid crops losses.

As you quest for higher quality crops that command higher market prices, you might hear about the use of a **surfactant** that improves various aspects of your hydroponics gardening.

A plant surfactant alters the surface tension of liquids as they interact with leaves and roots. This can dramatically improve your gardening success rate.

For one thing, it's wrong to think that the composition of your nutrient solution is the only thing that affects nutrients uptake. While this is itself an important factor, it's also important to realize that the physical structure of your nutrient solution might be preventing optimum uptake. Plant surfactants work by reducing the surface tension of the water, which will **make it easier for your roots to intake more nutrients faster**.

Foliar feeding is a brilliant means of getting more nutrients into your plant, and surfactants increase the feed rate of foliar feeding. Foliar spray doesn't work too well unless the foliar spray actually sticks to the leaves. You can make this easier just by adding in a little bit of plant surfactant. This increases nutrient uptake into the leaves. In addition, **surfactants help you make the most use of your foliar spray, getting superior results with less work and less money**.

Please note that most hydroponics surfactants are inferior formulas that can actually clog the stomata (pores) on plant leaves through which plants "breathe." You want to only use the highest-quality surfactants. A superior hydroponics company will offer organic and non-organic surfactants to accommodate all types of gardening.

Seaweed Extract: The gift from the sea to you.

Kelp is a kind of algae that thrives in very harsh conditions. Its existence is threatened continuously because of low light, freezing temperatures and rough ocean currents, so it is forced to use a lot of internal vitamins and hormones that help the kelp grow at astounding rates and resist stress. Indeed, kelp is a super-plant that grows faster than anything on land, and it do it poorly lit and extremely cold conditions, thanks to its natural supply of hormones.

Seaweed extract provides your plants micronutrients, but one of the primary reasons seaweed extract helps you get larger flowers is because it comes packed with a lot of hormones that stoke vegetative and floral growth.

Quality manufacturers of seaweed extract **can help you enjoy all of the major bloom-boosting benefits of these natural hormones.**

Along with seaweed extract, many growers recommend you give vitamins to your plants. The most beneficial vitamins for hydroponics plants are the various B vitamins that help during specific plant phases, such as cloning, when plants are subjected to high degrees of stress.

You'll also be glad to realize that vitamins can help plants defeat disease and recover from it. There are few things more frustrating that stepping into your grow room and seeing that some disease is plaguing your plants. **As with their use in humans, vitamins help plants resist and fight off diseases.**

Vitamins also help plants grow fast and yield big even in very harsh grow room conditions. Because after all, bright lights, fans, and walls are not the usual environment for plants. Most indoor gardens are unnatural and harsh places for plants, and it can harm them.

Feeding vitamins to plants is one way to mitigate the damagingly unnatural conditions of most grow rooms.

Even with vitamins, you can still lose your crop due to viruses, disease and other problems. Many growers are completely unprepared for these problems, but now that

you've read this, you'll be prepared.

Guess what? You can buy a formula containing salicylic acid, which will give your plants **an extra layer of protection against viral diseases**. This substance works just like a vaccination, strengthening your plants defenses against viruses and other pathogens that can cause serious damage to all of your gardening efforts. You can use it as a root tonic and foliar spray, to get serious all around protection.

And as an added bonus, salicylic acid also boosts resin gland production!

Speaking of added bonuses, here's some information about a space-age growing technology that's growing in popularity. It's called **Aeroponics.**

Here's a very simple definition of aeroponics: it means growing plants whose roots are rooted in air. How do they get water and nutrients? Those components are periodically sprayed onto the roots.

Aeroponics may seem simple enough, especially after you've seen those miniature aeroponic systems sold through infomercials and on the Internet. And aeroponics does give you an increase in yield and a lot of other benefits but-- aeroponics also presents unique challenges.

First off, any mechanical malfunction or power outage will cause your roots to dry out very quickly. It is also a costlier system, meaning it may strain your budget. But with these downsides comes numerous advantages, which should be appealing to almost any hydroponics grower.

For example, an aeroponics system uses air as its root zone medium. This has numerous advantages, such as saving you money and labor. It can be extremely labor intensive to fill your grow trays or buckets with rockwool, soil mix, moss, coco coir, etc. It can also be difficult to clean out your medium to make sure that there isn't any leftover organic material. Air is far more fun.

Aeroponics is beneficial to the environment. With no medium to dispose off, less hydroponic waste gets dumped in landfills. Speaking of waste, those harmful microbes that grow in solid root zone media like rockwool…well they have a hard time growing in

air.

And of course, it can be much easier on your pocketbook over time. You don't need to worry about purchasing more growing medium.

Plants in an aeroponic system dangle their roots in a growing chamber that is kept at one hundred percent humidity maintained by using misting nozzles that periodically spray nutrient solution into the growing chamber.

This means that very little water has to be used at all, because the roots only suck up as much moisture as they need. You don't waste nutrients or water with aeroponics.
In fact, one of the reasons NASA became interested in aeroponics as a means to grow food aboard space shuttles is that aero efficiently uses water.

Plant roots need oxygen, and with traditional hydroponic growing some root zone media hold and transfer oxygen better than others. This might mean you have to mix different types of media, or be careful how you water, so you don't waterlog roots and choke them of the oxygen they need.

With aeroponics, your roots dangle in the air and you're assured they always receive enough oxygen to grow and function at their potential.

Studies show that this aeroponics helps your plants germinate and grow faster. Combined with the right kind of nutrients, this can translate into extremely fast harvests, and can allow you to enjoy the fruits (and vegetables) of your labor that much more!

One of the persistent glitches that can develop in aeroponics gardens is that the mist nozzles can get clogged. When this happens, your plants are starved of water and nutrients.

This is why sanitation and cleaning are very important. Keep the nozzles clean or you will suffer.

Another concern is the "root box" or "root tube." Your roots have to grow in total darkness so no moisture leaks out and no light leaks in.

Finally, make sure you only use top-quality nutrients in aeroponics. Many types of nutrients and supplements will clog the emitters. You've got to get the best nutrients and supplements that will flow easily through your misting system.

No matter if you grow in aeroponics or in soil, it's good to get the most for your hydroponics investment. Now you can **follow these simple tips to save money on hydroponics equipment and operating costs.**

Just because a piece of equipment appears cheap, that does not mean that it will actually save you money in the long run. For example, it can be tempting to purchase used equipment off of craigslist or eBay, but used equipment is more prone to breakdowns and other problems, which will result in additional expenses in the form of repair or complete replacement. Newer equipment can be pricier, but will actually save you money over the course of several growing seasons as you also avoid headaches and hassles.

Lighting is another type of equipment where up-front costs can be deceptive. Fluorescent lights, for example, might appear appealing for their affordability and low energy requirements, but when you factor how little use that they actually offer to the average hydroponic grower and how often you have to replace them, the cost can add up over time. Learn what the cost per hour is of each grow light you are interested in purchasing, and how often you will have to replace them, and factor that before you buy.

You certainly don't want to purchase a very large hanging lamp if all you want to grow is a couple of plants. And you don't want to purchase a 150 watt set-up if you intend to grow row after row of plants. Evaluate your gardening goals, size and space before you buy equipment.

Comparison shopping is a great way to get the best price. The Internet helps you quickly comparison shop hydroponics equipment without ever leaving your home, and the costs are often cheaper than what you might find at brick and mortar retailers, even when you factor in shipping. But just to make sure you are looking at the broadest swath of prices, call around to your local hydroponics retailers and see what prices they offer on comparable equipment.

Another way to save money is to **build your own grow system**. It's true that

hydroponics retailers often offer complete, all-in-one systems that do not require you to buy anything else to start growing. You pay a premium for these systems because other people did all the work for you.

But in many cases you can build a customized system that fits your grow room, growing style and budget, even if you didn't do well in your Shop class at school. This will cost you pennies on the dollar compared to buying a readymade system at a grow store.

Invest in a high-end electronic digital ballast. These are so much more versatile, quiet and reliable than the old school ballasts that weighed a ton, made too much heat, and were as loud as a freight train.

Along with all the valuable tips you've already learned from this dossier, one other thing on most growers' minds is how nutrients affect plant health.

To really get at this concept, I'd like you to consider some examples from the world of human nutrition. First, let's imagine two athletes who have equal ability, training schedules and body types.

The difference is one of them is on a junk food diet high in bad fats, fake sugars, cheap carbs, and low quality protein while the other athlete is eating a balanced diet of healthy fats, naturally-derived sugars, and efficient proteins.

Let's face it, not only would the junk food athlete end up being uncompetitive, but eventually his body becomes bloated, arteries clogged, skin breaking out, metabolism screwed up, fat, sluggish, hormonal imbalances, immune system failure, viruses, diseases, organ damage, low stamina…a mess.

In fact, poor diet is the number one cause of heart disease, colon cancer, diabetes, obesity, mutations, inefficient cognitive performance and a lot of other health problems people have. Just today I read that one third of all Americans are morbidly obese!

So what the heck does this have to do with your hydroponics plants? Well, what I've discovered working closely with my plant scientists and nutrients chemists all these years is that plants are pretty much like humans…how well they grow and produce is directly linked to their diet.

Yes, that's the stark truth of it-- what you feed your valuable plants and how you feed them determines whether your plants are healthy or sick, whether they mature rapidly from clones and cuttings to adult plants that deliver big, valuable harvests for you.

And as it is with the most elite athletes and their nutrient program, feeding your plants special supplements such as complex sugars, amino acids, hormones, growth factors, vitamins, vaccinations, protectants, probiotic beneficial bacteria, and other boosters can give you a gold medal winner.

Because now agricultural science and technology have progressed in the last 100 years, because that relates to how hydroponics nutrients have changed over time.

For example, 1937 was the year that hydroponics was born. It was popularized that year so long ago by a brilliant plant scientist from the University of California. His name was Dr. William Gericke, and he almost single-handedly discovered how to use synthetic nutrients to successfully grow crops without soil.

When you think about it, 1937 is a long time ago and so much has changed since then. Space travel, rocket ships, laser weapons, computers, cellular phones and most of the other technology we take for granted just did not exist at all.

And the same thing has occurred in the fields of chemistry, medicine, and agriculture. There was no such thing as a genetically modified soybean until just a few years ago. There were no indoor gardens with high intensity lights either. The world has made huge advances in those areas, and the changes are accelerating.

But hydroponics nutrients stayed pretty much the same as they were in 1937. And that explains why you still had to invest in pH and PPM meters, pH Up, pH Down and other stuff just so you can get your nutrients to work at all.

Because as you've been told over and over, your plants won't absorb nutrients unless your nutrient water is in that narrow 5.8 to 6.3 pH range.

The fact is, the nutrients sold to you would be the same scenario as if a vitamin company sold you a multivitamin-- but told you that in order for your body to absorb the nutrition

in the multivitamin you have to carefully monitor your body's pH and adjust it up or down to keep it in a narrow window of nutrient availability.

Now fast forward to 2009. These days, you can find nutrients that have available high-quality chelates, binders, molecular structures, plant growth substances, and manufacturing processes that give you a totally new type of hydroponics nutrients so you no longer have to worry about pH, PPM, or mixing problems.

Yeah, I founded a nutrients company and I am glad that there are new ways to configure and manufacture nutrients so they work easier and better for you.

But I am not asking you to buy this or that nutrient (including my own company's products) based on the history of hydroponics and how there are now nutrients that contain the latest technologies reflecting changes in chemistry, plant science and related fields.

What I am saying is that you finally have a variety of choices. You could stay with the type of nutrients that were created in 1937 and are still being sold today, or you could use the newer type. It's whatever you are comfortable with, whatever works best for you.

As always, dedicated to your bigger yields,

Big Mike Straumietis
Co-Founder, Advanced Nutrients

PS- Tell your grower friends how they can get a copy of this report, so they can get bigger yields too.