



ABSTRACT:

The advanced grower can employ certain methods which will greatly increase yield and quality. Indoor gardening is ALL about emulating the perfect outdoor environment, Day and Night, for the plants. Light will ALWAYS be the limiting factor indoors, since it does not come from a 360° source and is not as bright or as “nutritious” for plants as the Sun is. The spectrum put off by Grow Lights pales in comparison to natural Sunlight. Therefore the Indoor Gardener needs to dial in all other variables to a precise degree. Not only can the factors needed for the Ideal Day be created and maintained, but the ideal season can be created as well. This Info Sheet on “Advanced Growing” will address all these factors below. Please refer to “Best Overall System Intergration”, “Why Run Drain to Waste”, “Reservoir and Management”, and “Maintaining a Healthy Root Zone” for a more complete picture of how to run an ideal system. We also suggest you ask for an updated “Nutrient Recipe” (for your nutrient of choice) and “Nutrient Schedule” as well.

Key Points towards a more Advanced Garden

- Hierarchy of factors contributing to a Larger Yield
- Cut The Concentration of Additives Down
- In general a Healthy Reservoir should bring the T.D.S. (ppms) down every day
- Changing Nutrient Solution regularly and making sure to FLUSH
- Nutrient Feeding Chart / Graph
- Creating a Seasonal Shift during Late Bloom from “Late Fall” to “Early Winter”
 - Lower Day / Night Room Temperatures during the last three weeks
 - Raise lights last two weeks
 - Use a Chiller to create a “Frost” at the Root Zone
 - Using Finishing Agents to aid into the final transition (ripening) phase
- Optimum Temperatures/Humidity - Day and night
- Trellis Netting and Overall “Full” Fruit Coverage

Hierarchy of Factors contributing to a Larger Yield

There are many environmental factors that contribute to healthy plant growth. In general if you take care of your garden and dial in your environment and your nutrient scheduling, your plants will flourish. And if your plants flourish and remain healthy throughout their entire life cycle. . .Your yield will surely rise and eventually soar. This section is concerned with Yield, not so much with other more authentic attributes or plant / fruit / flower quality. Here is a list of factors in order from most important to least important that contribute to final yield of fruit / flowers:

1. Light - Directly proportional to final yield. More Light = More Yield (up to a point of obvious burning.)
2. Aeration to the Root Zone - More air (O₂) to the roots the better. It is almost impossible to provide too much.
3. Carbon Dioxide - CO₂ can be used at up to 4X what is found at normal atmospheric levels - 1500 ppm is ideal.
4. Temperature - Keeping the temperature at 76°F - 78°F. (with 1500 ppms CO₂ at 86°F is optimum.)
See below for more exact temperature measurements for each phase of growth.
5. Humidity - Keeping it between 45-65%. 65% humidity in Vegetative phase and 45-55% in Bloom Phase.
6. Nutrients - most people think this is the most important thing. It isn't. Keep nutrient TDS (ppm) levels in check.
Make sure to NOT overdose additives. So many to choose from these days. Easy to get confused.

As you can see Nutrients / Additives are at the bottom of this list, and we don't want you to get the idea that “all nutrients are created equal” (see our info sheet on Nutrients or on Chelators, etc.) or that no additives can greatly increase your yield or available fragrance; because that would be far from the truth. But what we are trying to say is that NO amount of nutrient or additives will make up for a lack of oxygen to the root system or a poorly designed Grow Space that runs too hot or does NOT exchange the air within the space often enough. Many inexperienced growers skimp on the basics and then try and make up for it with the newest “magic bullet” additive on the market.



We Suggest: Add additives at ¼ strength to be safe at first then increase the dosage by ¼ the next week until you have a good understanding and feeling of what this additive is doing.

In general a Healthy Recirculating Reservoir should bring the TDS. (ppms) down every day.

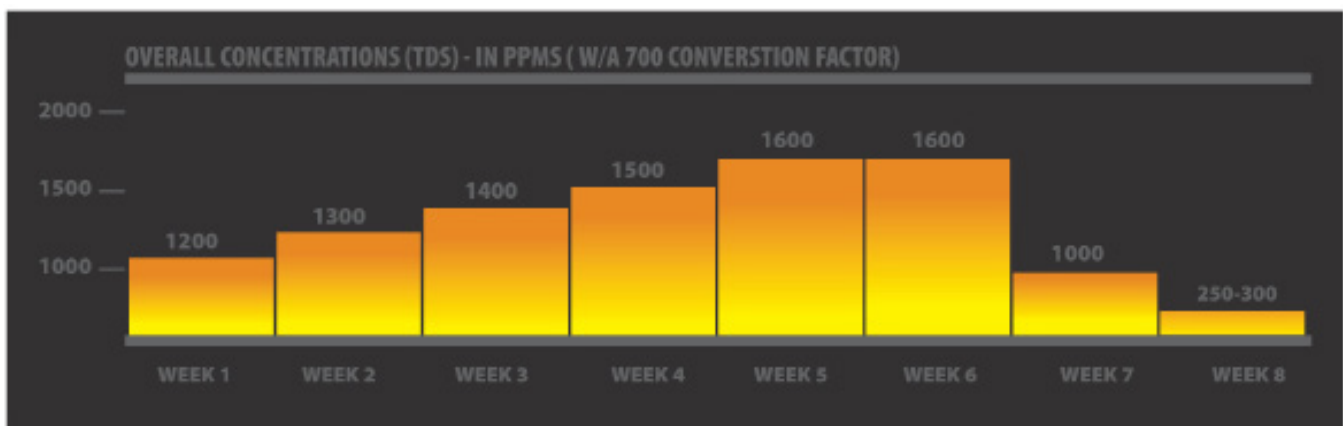
The total concentration of nutrient should always be relatively stable within your reservoir. Ideally plants should take up an even amount of nutrient and water. In reality, this rarely actually happens. Plants will take up either more nutrient or more water and will leave the reservoir solution out of balance. This being said, a sophisticated grower can tell a lot from his reservoir solution and its fluctuations. If the ppms of the solution have gone up this means that there is less water in solution. The water has either evaporated or the plants have taken up more water than nutrient since the last time the reservoir was checked - or both - water has evaporated and the plants have taken up more water than nutrient. If the reverse has happened and the ppms of the solution have fallen, than it is easy to glean that the plants have taken up more nutrient than water from the reservoir. What we do NOT want is major fluctuations in either direction. If a reservoir's ppms go up slightly it is usually because the concentration of nutrients in solution (T.D.S.) are too high. This is not always a bad thing. During weeks 4-6 we are trying to push as much food (nutrients and additives) into the plants as possible and if the ppms go up slightly (every day) this indicates to us that we are pushing them as hard as possible. In general though we want the ppms to lower. . .Slightly. . .Indicating to us that the plants have all that they need and are content to drink slightly more water than nutrient. Ideally, we are looking for the reservoir solution to sway no more than 25-50 ppms every day. (If Running Drain to Waste - Disregard this paragraph.)

Changing Nutrient Solution regularly and making sure to FLUSH

It is important to change out your nutrient solution on a weekly basis (at least). This will ensure that all stays fresh and few if any precipitates have a chance to form. It is also important to Flush on a regular basis (especially if you are growing in Coco, Rockwool, or Soil.) Please check our Info Sheets on "Flushing" and "Reservoir Maintenance" for more details.

Nutrient Feeding Chart / Graph

Learning to read one of these graphs is a very important step towards becoming a successful grower. Not only are the overall TDS numbers for each week of the Bloom phase (and Veg. phase - depending on what graph you are looking at) indicated on this chart below, but one can take in more information that. It is easy to see as the weeks go on the TDS values slowly rise. But how fast are they rising? Well, on the chart below they are going up 100ppms every week. A good grower can take the ppms up by 2-300 ppms per week! You can also see that this chart started the Bloom Phase at 1200 ppms which is to some pretty high. To us it is just "average". Some Bloom Feeding schedules have growers starting the Bloom Phase at 13-1400 ppms. You can also see that at week 5-6 we have peaked out on our TDS (ppms). After this point, for week 7 and then week 8 (on the graph) the ppms are going down dramatically. This adds to the factors (listed on the next page) that indicate to the plant it is time to finish (ripen). It also allows for a healthy Flushing of all minerals.





Cut The Concentration of Additives Down

With so many additives available today, and so many additives coming to the market place every month, it is extremely tempting to use an ever-growing amount of them. This can be extremely catastrophic to your plants' root systems as well as your plants' overall health and vigor. There are so many products out there from different companies touting the fact that they "increase the plants metabolism" or "help with nutrient uptake," that it is increasingly easier to add two of the same product (from different manufacturers). If both products are applied at their full strengths or even ½ strengths each plants can be "stressed" or worse still "burned" or even straight up killed. Make sure you research what you are adding and have at least a cursory understanding of what you are giving your babies.

Creating a Seasonal Shift during Late Bloom from "Late Fall" to "Early Winter"

This shift will help plants understand that their time is coming to an end. Your plants will move all remaining sugars from all other parts of the plant to the fruit / flowers that they have been working on creating. They will ripen all fruit and create more oil / sugar / resin. Plants that are fully finished will have more overall weight in their fruit and flowers as well. As Plants finish up, it is natural and expected to see "fall colors" come out in leaves. During the last 2-3 weeks we are looking for reds, yellows, and purples - this is not to be mistaken for a "bad thing". It is a sign that all is working as planned.

Lower Day / Night Room Temperatures during the last Three weeks.

The last three weeks should have a pronounced effect on your plants. Plants communicate through hormones and other signal proteins. In order for them to create these crucial chemical signals indicating to the fruit and flowers to ripen, Plants need to receive environmental cues. These cues tell them the season and let them know that it is time to finish up. By following the guides indicating in this Info Sheet, we are creating an onslaught of cues letting them know that it is "that" time and that they need to let the hormones fly.

Three weeks before finishing (the beginning of week 6 on an eight week Fruit / Flower cycle) Day temperatures should drop 4-5 deg. F. from where they have been. Night-time differential should be 10 deg. F. 2 weeks before finishing we want the Day time Temps to be another 4-5 degrees less than week 6. Night time Differential should be 15 deg. (Around 55-60 deg. F. if possible.) For the final week, we want Day time temperature to be 70 deg. F. and Night time temperature to be as close to 50 deg. as possible. This will help force the plants to ripen - changing colors whenever possible, and maximizing flavor and aroma.

Raise Lights during last Two weeks

Again, to help make this seasonal shift a reality for your plants, you should raise your lights up 4-6 inches (4" for a 600 watt and 6" for a 1000 watt,) every week for the last two weeks. This will help create more compact and dense fruit clusters while further increasing the ripening process.

Using a Water Chiller to create a late Bloom "Frost" at the Root Zone

As said before in previous Info Sheets, it is of critical importance for a healthy root zone that water temperatures stay at 66°F - 68°F. This does not mean that they can sometimes be between this temp zone and sometimes hotter or colder than this temperature. It is about consistently staying at 66°F - 68°F. At this level, the nutrient solution holds a good amount of oxygen within it, and the nutrient absorption rates are still high enough for most plants. These lower water temperatures will also help promote aerobic beneficial microbes growth and allow them to give BIG returns to your precious plants.

By lowering the water Temperature during the final two weeks, a Water Chiller may also be employed to create a "Frost" at the root zone as well. You will help your indoor plants make a transition into late Fall and let them know that it is time to finish up for "Harvest Time". Assuming that you have an "eight week" fruiting / flowering plant (like most tomatoes, cucumbers, and peppers - as well as many other favorite plants are) - at the beginning of week 7, make sure to lower your water temperature from 66°F - 68°F down to 62°F - 64°F. Then again, at the beginning of week 8, lower the water temperatures down to 55°F - 57°F. For the final days, bring the Water Chiller down to 45°F - 47°F. This will signal the plant that the first frost has arrived and that it is time to squeeze out any remaining "juice" and send it up into the fruit and flowers. The temperatures listed here are only an indication of where you want to actually be. All plants will respond differently. Feel free to experiment.

Using Finishing Agents to aid into the final transition (ripening) phase

Grand Finale, Briximus Maximus, and Purple Maxx will make for a more pronounced transition into the late Fall early winter period that we are looking for. Grand Finale uses tons of high brix sugars coupled with Magnesium sulfate to bring out more flavor in your final 2 weeks. Grand Finale was designed to be used in conjunction with a second additive. Briximus Maximus (through two proprietary natural/organic compounds) will remove all available nitrogen from your leaves. This will remove any residual chlorophyll from the taste of your fruits (chlorophyll is what is responsible for creating a grassy fragrance, and taste residue). Purple Maxx will help bring out way more oil / sugar / resin, and if the plant has it in its genetic composition, will bring out purple colors as well.



Temperature / Humidity CO2 Schedule for Bloom (Fruit / Flower) Stage of Plant Growth

This assumes that you have an eight week "Fruiting" plant such as most strains of tomatoes, cucumbers, or peppers - as well as many other of your favorite plants.

Week 2-5 of Vegetative Growth

Day Temp - 76°F - 78° (86°F with CO2 @ 1500PPMS)

- Please note if running CO2 do not up to 1500PPMS until 2nd Week

- Keep Temps at 76°F - 78°F for 1st week of Veg.

Humidity - 60-65% (unless room has powdery mildew)

CO2 Levels - 1500 ppms (after 1st week of Veg.)

Week 1-5 of Bloom (Fruit / Flower Stage)

Day Temp - 76°F - 78° (86°F with CO2 @ 1500PPMS)

Night Temp - 70°F (79°F with CO2 @ 1500PPMS)

Humidity - 50-55% (unless plant type likes it higher)

CO2 Levels - 1500 ppms

Week 6 of Bloom

Day Temp - 72-75°F (74-75°F with CO2 @ 700PPMS)

Night Temp - 65°F

Humidity - 50% humidity

CO2 levels - 700 ppms

Week 7 of Bloom

Day Temp - 70°F - 73°F (72°F - 74°F with CO2 @ 500-700PPM)

Night Temp - 60°F (even 55°F if you can go this low)

Humidity - 50% (unless fear of mildew / mold - then lower)

CO2 Levels - 500-700 ppms

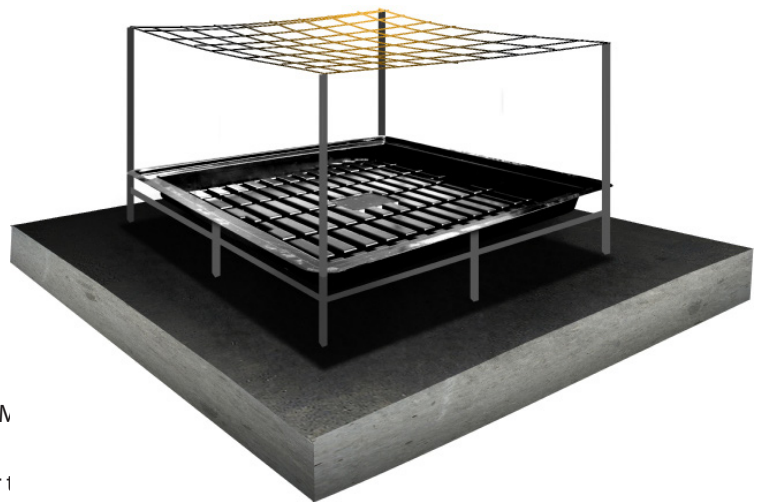
Week 8 of Bloom (Final Week)

Day Temp - 70°F - 72°F (70°F - 72°F - with Co2 at 500ppms or TURN co2 OFF!)

Night Temp - 50°F (if you can go that low)

Humidity - 50% (unless fear of mildew / mold - then lower to 40-45% especially at night)

CO2 Levels - 500 ppms



Trellis Net for Optimum Yield

We believe a Trellis-Net is the best way to grow. As opposed to bamboo stakes or plastic cages, the trellis can easily provide support for branches and main stalks while providing for an easy way to bend and weave the growth of larger plants providing for an equal amount of light to all fruiting/flowering zones. In a trellis your fruit should be very close together (but not touching). Your lights will cover a certain area (depending on size and reflector) and it's your job as a grower to make sure that whenever there is light there is fruit growing.