

- Change reservoir every 7 days
- Keep pH between 5.6 - 6.1. (If using Soil make sure pH is between 6.2-6.5).
- Keep Water Temp at 66-68 F
- Only add Additives whenever you change out reservoir
- Add Nutrient up to Desired TDS level
- Always Adjust pH last - No matter what is put into the res. solution - even water. . Adjust pH last!

### Reservoir Maintenance

- Add all Additives first (follow directions below)
  - Cannazym** - Digests Dead or Dying Root Matter. Enzyme Solution. Add 2-4tsp./Gal. (10-20mL/Gal.)
  - Roots Excel** - Blows Roots way out. Awesome product! - 1.1mL per Gallon.
  - Heavy FIRE** - Strongest Bloom Stimulant on Market. All in One Bottle. 2-4mL per Gal.
  - Great White** - Great Mix of Microbes. Both Fungal and Bacterial. Add at rate of 1 scoop / 2 Gallons.
  - PRIME**- (sweetner / microbe feed) 1-4 tsp. per Gallon (also metabolism booster.) (5-20mL/Gallon)
  - Foliar**- Contains Photosynthates - Great Energy Boost - 40mL / Liter -(150mL / Gallon) Spray 2x a week.
  - Final Phase** - 2tsp. per Gallon. (10mL/Gallon)
- Now add your nutrient to the desired TDS (ppm). *If the concentration is ever too high - dilute with water.*
- Check and adjust pH. (5.6 - 6.1 for Rockwool/Coco). (6.2 - 6.7 for Soil).
- Make sure to have air stones in reservoir. O2 is more important than Additives. More aeration is better.
- Make sure water temp is 66-68 deg. F. (More oxygen is available at cooler temperatures.)
- Note: There are a lot of additives. You don't need to use them all. They each have a specific purpose.
- Note: For even more Plant Energy Spray with **Heavy 16 Foliar** in Veg. (full soak) and as a light dusting throughout the Bloom Phase (up through week 4) at the rate of 40mL/Quart. This will ensure more plant energy and ability to deal with environmental stress. Also helps to produce massive oil / sugar content.

### Other Maintenance

- Make sure you have great drainage in trays/pots. No roots sitting in standing water!
- *Make sure you have great drainage in trays/pots. No roots sitting in standing water!*
- Additives should not equal more than 33% of your overall TDS (ppms.) Ex. 1200 ppms - Additives should not be more than 400 ppms at the most. Additives are anything except Main nutrient 2 Part.
- Check for Nutrient burn. If you see leaf tips yellow/browning or burning on edges of leaves, lower your Overall TDS values. Do not let plants get necrotic spotting in the middle of leaves. If you see any serious burning - FLUSH reservoir and re-do nutrients at 200 ppm lower than before.
- Always look for signs of overwatering - Plants get heavy saggy look and feel to them. Adjust water timer.
- Any time you do a FLUSH (and this is only in Mediums such as Rockwool or Coco Based) check to see what your "Run-Off" pH and (ppms) come out at. A healthy medium will have the same pH & ppms as the water you are putting in. An example- during a FLUSH with RO water is a pH of 5.8 and a ppm of 25-75. We want it to match within .2pH and 100ppms. If after FLUSHING your ppms are still high- FLUSH more! If pH is off - lower or raise pH by the difference and FLUSH again. Ex. pH Going in is 5.8-Coming out is 6.5 - Flush at around 5.0. Test pH again. Repeat as necessary. Call with Questions.

## Seedlings or Cuttings:

Use **Heavy 16 Grow A+B** (for main nutrient)

*If starting from seed* you will want to build your TDS up. You will start at 300-400 ppms after the seed cracks. To crack the seed soak in warm water between a damp paper-towel for a couple of days. Once cracked, move to **Ready Grow** cube. You will bring TDS up 200 or so ppms per week until at 1000-1200ppms for Bloom.

*If Using Rooted Cuttings*, you will want to start your clones at the same TDS that the parents were kept at. If you do not know what that level was, a safe place to start is 800 - 1000 ppms. You will be looking for new growth on the tops of the plant before we can safely put them into the vegetative stage.

Note: One of the major problems people have with cuttings is that they throw them under too intense of a light source. Clones are coming from an area with a low intensity of light and extremely humid conditions. Make sure your HID light is high at first and lower it 6" a day until desired height is reached. Also spray plants occasionally with **Liquid Karma**, and combined with a wetting agent like **Wet Betty**.

## Vegetative Stage:

Use **Heavy 16 Grow A + B** Nutrient

*If starting from seed* - you will raise your ppms up to 1000-1200 ppms throughout this phase. You will want to start at 300-400 ppms. For the first 2 weeks you will coddle your plants and tend to their every desire. You will then raise the ppms 200 per week. Look to see if there is any damage at all to their leaves. If yes, lower the TDS! Steadily raise ppms every week until you get to 1000-1200 ppms. You should be able to follow the Bloom chart/map in this hand-out. You may have to start week 1 at 1100 instead of 1200. If this is the case, raise ppms 100 every week until you get to 1500 in week 5 (instead of week 4.)

*If starting from Rooted Clone* - You will want to keep your plants in the 1000 ppm - 1200 ppm range for this entire cycle. No Higher levels needed. *Yes. You can start at 800 -1000ppms! Because thats where parent was.* Before adding Heavy 16 Nutrient make sure to Add Each of your desired additives.

Now add Nutrient to desired TDS (ppms).

Lastly, you will want to maintain your **pH at 5.8 - 6.1**.

*Here is an example of a 3 week vegetative schedule (starting from cuttings/clones of your favorite plant(s))*

**Week 1** - TDS 800 (Fresh Reservoir) (**Roots Excel** 1mL/Gal., **PRIME** 1tsp./Gal. **Great White** 1scoop/2 Gal.)

Connect Air Stones to Air Pump and submersestones in Water. Make Sure they work.

Check Timer for Pump, and set appropriate on/off times; depending on system type and grow media used.

*Make Sure Tray(s) / Pots Drain.*

Start Your Reservoir by adding **Reverse Osmosis (RO) water**.

Next Add Additives. (**Roots Excel, PRIME, Great White**).

Now add **Heavy 16 A+B Grow** - bring TDS to 800 ppms. Adjust daily- keep at 800 ppms all week.

Adjust **pH to 5.8 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Check water temp after 1-2 days Make sure it is between 66-68 deg. F.

This is important to get right Now!

**Week 2** - TDS 950 (Same steps as Week 1 - New TDS)

Fill and Dose Reservoir. Make sure Reservoir temperature is between 66-68 deg. F.

Next Add Additives. (**Roots Excel, PRIME, and Great White**).

Now add **Heavy 16 A+B Grow** and bring TDS up to 950 ppms.

Adjust **pH to 5.8 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Check water temp after 1-2 days Make sure it is between 66-68 deg. F. This is important to get right Now!

Check Timer for Pump, and set appropriate on/off times; Make sure it is plugged in and working.

Now is the time to figure out and dial in your mediums water needs. (Aside from Grow Rocks / Hydroton) you will want to make sure that your given medium (Coco/ Soiless / Rockwool) goes from WET to BARELY MOIST before you water again.

This is critical to get right now.



**Week 3** - TDS 1100 (Same as last 2 weeks except add 1tsp of Cannazym)

Start Your Reservoir by adding **RO water** Check water temp - make sure it is between 66-68 deg. F.

Connect Air Stones to Air Pump and submerge Stones (Not Pump!) in Water, Making Sure Stones work.

Next Add Additives. (**Roots Excel, PRIME, Cannazym and Great White**).

Now add **Heavy 16 A+B Grow** - bring TDS to 1100 ppms. Adjust daily - keep at 1100 ppms all week.

Adjust **pH to 5.8 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Make Sure Tray(s) / Pots are still Draining.

Make sure you CONNECT Irrigation PUMP to timer and it is ON!

### **Fruit/Flower Stage:**

Use **Heavy 16 BUD A + B Nutrient** Start w/ **pH 5.8**.

Add at different times and rates -**Roots Excel** (1mL/Gal.) **Heavy FIRE** (2-4mL/GAL) **PRIME** (1 - 3tsp. per Gallon,) **Great White** (1 scoop / 2 Gal.) **Cannazym** (8 - 20mL / Gal.).

Use **Roots Excel** all the way through for Root Protection. You will be raising your ppms 150 per week.

Week 1 TDS - 1200 ppms - **PRIME** 1tsp./Gal., **Great White** 1scoop/2 Gal., **FIRE** - 2mL/Gal. **Cannazym** 10mL/Gal.

Week 2 TDS - 1300 ppms - **pH 5.8 in Hydro / Coco. 6.2-6.7 in Soil**. Nothing else changes.

Week 3 TDS - 1400 ppms - Nothing Changes

Week 4 TDS - 1500 ppms - Raise **PRIME** to 2tsp./Gal., **FIRE** goes to 3mL/Gal.

Week 5 TDS - 1600 ppms - Lower **pH** in Hydro / Coco. Stop **Great White**.

Week 6 TDS - 1600 ppms - Raise **PRIME** -3tsp./Gal. (15mL/Gal.) Raise **FIRE** to 4mL/Gal.

Week 7 TDS - 1000 ppms - Raise **Cannazym** to 4tsp./Gal.

Week 8 TDS - 0-300 ppms - FLUSH anywhere from 4-7 days to end of Harvest - Look below for instructions.

Note: You will be adding **HEAVY FIRE** and **PRIME** for larger fruit / flowers throughout the Bloom phase. Increase the dosage of these additives throughout. For example, if the range of use of these additives is 1-2tsp. then start at 1tsp. and get to 2 tsp. by week 5 of Bloom. If you ever see signs of stress then reduce the strength of these additives immediately.

You will harvest anywhere from wks. 7-10 of Bloom. At that stage you will need to Flush. We suggest **Final Phase**. You can see that the general trend here is that you will be raising your TDS up from 900 at week 1 all the way up to 1300 ppms by the 6th week bloom. (Note that some plants need more than 8 weeks to create fruits/flowers - up to 10 weeks. Adjust accordingly.)

**Note: If at any point you see rust colored spotting, leaf tip burn, discoloration around leaf edges, yellowing of newer leaves, etc. check pH, check roots, lower TDS by 200-300. If it gets worse, drain / Flush Reservoir.**

Working with Organics is a tricky endeavor. It can be very rewarding in the long run because your fruit/flowers will be more aromatic, have more flavor, and generally look very beautiful. That is why we are using this many additives in the reservoir. Each one is used for a specific duration, at a specific time to produce a specific effect. Pay close attention to your plants. And again --- If signs of nutrient burn are observed, lower TDS.

*Here is an example of an eight-week bloom schedule: (For best results, transfer this onto a real calendar! )*

**FLUSH - Use Final Phase. Make sure water comes out clean. "From Dirty to Clean"**

**Week 1** - TDS 1200 **PRIME** 1tsp./Gal., **Roots Excel** 1mL/Gal., **FIRE** - 2mL/Gal., **Cannazym** 2tsp./Gal., **Great White**

Drain and Refill Reservoir using **RO water**. Check water temp after 1 day. Make sure it is between 66-68 deg. F. Connect Air Stones to Air Pump and submerge Stones (Not Pump!) in Water, Making Sure Stones work.

Add Additives. (**Roots Excel, Cannazym, Great White, PRIME, FIRE**.)

Now add **Heavy 16 BUD A + B** - bring TDS to 1200 ppms.

Adjust **pH to 5.6 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Make sure Tray(s) are draining completely.

Make sure you CONNECT Irrigation PUMP to timer and it is ON!



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**Week 2** - TDS 1300 (All additives at same dosages.)

Fill Reservoir w/ **RO water**.

Make sure Reservoir temperature is between 66-68 deg. F.

Add Additives. (**Roots Excel, Cannazym, Great White, PRIME, FIRE.**)

Now add **Heavy 16 BUD A+B** and bring TDS up to 1300

Adjust **pH to 5.6 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Keep levels of pH and TDS correct. Make sure you have good drainage!

**Week 3** - TDS 1400 (All additives at same dosages.)

Drain and Refill Reservoir using **RO water**.

Check water temp after 1-2 days. Make sure it is 66-68 deg. F.

Connect Air Stones to Air Pump and submerge Stones (Not Pump!) in Water. Make Sure Stones work.

Add Additives. (**Roots Excel, Cannazym, Great White, PRIME, FIRE.**)

Now add **Heavy 16 BUD A+B**. Bringing TDS to 1400 ppms.

Adjust **pH to 5.8 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Make Sure Roots are still healthy.

Make sure you **CONNECT** Irrigation PUMP to timer and it is **ON!** *Common mistake after draining reservoir.*

You should see good mycorrhizae growth from Piranha. White fuzzy healthy roots.

A critical stage of development. Organics Alive should be in Full Bloom. **Roots Excel** keeping the roots healthy.

**Week 4** - TDS 1500 (Increase **PRIME** to 2 tsp./Gal. **FIRE** goes to 3mL/Gal.)(Last week of **Great White.**)

Fill Reservoir w/**RO Water**.

Make sure Reservoir temperature is 66-68 deg. F.

Add Additives. (**Roots Excel, Cannazym, Great White, PRIME, FIRE.**)

Now add **Heavy 16 BUD A+B** and bring TDS up to 1500 ppms.

Adjust **pH to 5.6 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Keep levels of pH and TDS correct.

Make sure you have good drainage! Roots can die easily from suffocation at this stage.

**FLUSH - Use Final Phase. Make sure water comes out clean. "From Dirty to Clean"**

**Week 5** - TDS 1600 (Stop using **Great White.**)

Start Your Reservoir by adding **RO water**.

Add Additives. (**Roots Excel, Cannazym, PRIME, FIRE.**)

Now add **Heavy 16 BUD A+B** - bring TDS to 1600 ppm.

Adjust **pH to 5.8 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Make sure Irrigation PUMP is connected to timer and that it is **ON!** Make sure Tray(s) are draining completely.

Make Sure Roots are still healthy. Almost at the home stretch!

Check water temp after 1-2 days. Make sure it is 66-68 deg. F.

**Week 6** - TDS 1600 - (Raise **PRIME** -3tsp./Gal. (15mL/Gal.) Raise **FIRE** to 4mL/Gal.)

Fill Reservoir w/ **RO water**.

Make sure Reservoir temperature is between 66-68 deg. F.

Add Additives. (**Roots Excel, Cannazym, PRIME, FIRE.**)

Check Water temp - it should be 66-68 deg. F.

Now add **Heavy 16 BUD A+B** - bring TDS to 1600 ppm.

Adjust **pH to 5.6 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

At this point fruit or flowers should be filling in rapidly and ripening has begun or is beginning.

Roots may be slightly yellow or cream colored on mature plants. Lower leaves can Yellow from a lack of Nitrogen.



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Look for signs of Nutrient Burn, Yellowing, Rust Color Spotting, Leaf tip burn. Only small amounts of this are acceptable at this stage. If you notice heavy damage, lower TDS 200 ppms, If damage continues, Flush and reduce TDS by 400ppms and lower strength of Additives - **PRIME, and FIRE.**

**Week 7** - TDS 1000 (Raise **Cannazym** to 4tsp./Gal.)

Start Your Reservoir by adding **RO water**

Connect Air Stones to Air Pump and submerge Stones (Not Pump!) in Water, Make Sure Stones work.

Add Additives. (**Roots Excel, Cannazym, PRIME, FIRE.**)

Now add **Heavy 16 BUD A+B**- bring TDS to 1000 ppm.

Adjust **pH to 5.6 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

Make sure Tray(s) and Pot(s) are draining completely.

Make Sure Roots are still healthy. If not, it should not matter that much, but try and do better NEXT time.

Make sure Irrigation PUMP is still connected to timer and it is ON!

Check water temp after 1-2 days. Make sure it is between 66-68 deg. F.

**FLUSH - Use Final Phase. Make sure water comes out clean. "From Dirty to Clean"**

**Week 8** - (**FLUSH!**) - Lower Res Tempsto 50 deg. F. - NO NUTRIENTS!

Fill Reservoir w/ **RO water**. Make sure Reservoir temperature is as close to 50 deg. F.

Add Additives. (**Roots Excel, Cannazym, PRIME, FIRE.**)

Adjust **pH to 5.6 - 6.1** (for Hydro / Rockwool / Coco). **pH to 6.2 - 6.7** (for Soil).

**FLUSH --- either at the beginning of this week and ignore the above. Or after 3 days Flush for final 4 days. Read Flushing notes below.**

### **Final Flushing:**

To flush, drain reservoir 4-7 days from finish. Fill with fresh water. Add **Final Phase** at a rate of 2tsp. per Gallon. Add Nutrient. Raise TDS to 500 ppms. Run for 1-2 days. Drain Reservoir. Repeat process (add Final Phase) and run until fruit is ripe. One a day until last flush which runs for 2 days.

### **General Notes:**

If at any point you see evidence of disease (persistent major pH shift, foamy / slimy-ness in the reservoir, large scale root death.)You will need to clean and sterilize the reservoir and trays. Flush out the pots and trays with a copious amount of water. Bleach as much of the hydro system as possible (including tubing, pump, reservoir and trays.) Bleach will kill diseases, but is also toxic to plants, so be sure to rinse well before reusing. Refill reservoir and re-dose. Be prepared to Flush the system every other day until the problem is solved.

It is also a good idea to wash out your reservoir monthly. On any one of the bi-weekly drains you can take it out and bleach it down. Then rinse it well to remove the bleach residue. When clean restart as normal.

Again, look for any signs of stress. Anything at all. If you see any discoloration, or any damage to the roots. Call us! Or, come in and talk with us about it! *We can help.* We can help - If its not too late!

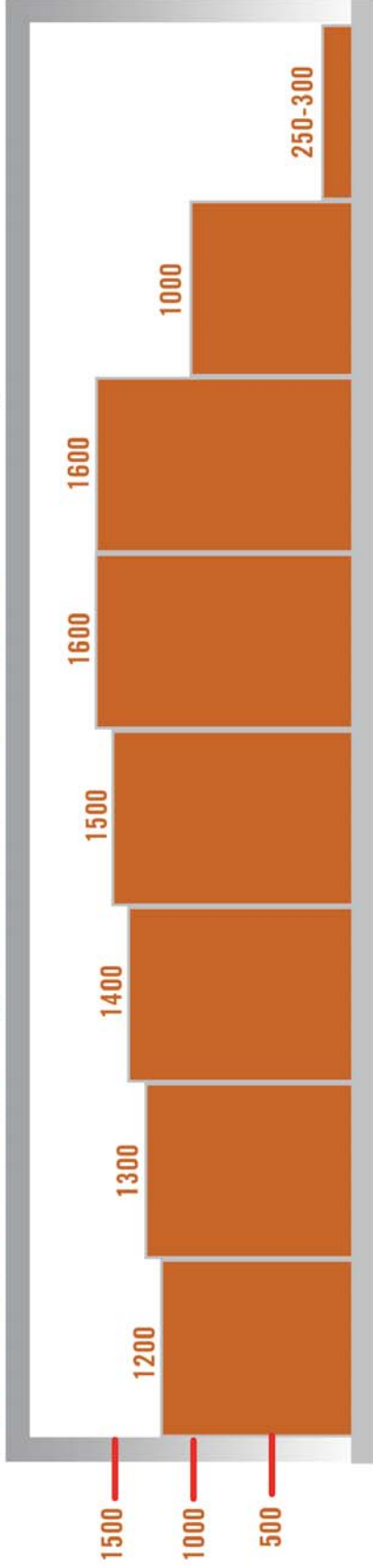
### **Disclaimer**

Individual results may vary. We are in no way responsible for your results. Environmental Conditions can change any end result. We are not responsible for other people's mistakes. This is a generalized recipe for tomatoes and cucumbers in particular. Use a TDS meter. Maintain pH. Maintain a Healthy Reservoir Temperature. Use RO water. Change Out Reservoir. Call us with problems. This recipe is intended for legal use only.



## Overall Concentrations (TDS) - in ppms (w/a 700 Conversion Factor)

## Heavy 16 BUD A+B as Main Nutrient



	week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8
Roots Excel		Roots Excel	Roots Excel	Roots Excel	Roots Excel	Roots Excel	Roots Excel	Roots Excel
1mL./Gal.	1mL./Gal.	1mL./Gal.	1mL./Gal.	1mL./Gal.	1mL./Gal.	1mL./Gal.	1mL./Gal.	1mL./Gal.
Cannazym		Cannazym	Cannazym	Cannazym	Cannazym	Cannazym	Cannazym	Cannazym
2tsp./Gal.	2tsp./Gal.	2tsp./Gal.	2tsp./Gal.	2tsp./Gal.	2tsp./Gal.	2tsp./Gal.	2tsp./Gal.	2tsp./Gal.
PRIME		PRIME	PRIME	PRIME	PRIME	PRIME	PRIME	PRIME
1tsp./Gal.	1tsp./Gal.	1tsp./Gal.	1tsp./Gal.	2tsp./Gal.	2tsp./Gal.	3tsp./Gal.	3tsp./Gal.	3tsp./Gal.
HEAVY FIRE		HEAVY FIRE	HEAVY FIRE	HEAVY FIRE	HEAVY FIRE	HEAVY FIRE	HEAVY FIRE	HEAVY FIRE
2mL/Gal.	2mL/Gal.	2mL/Gal.	2mL/Gal.	3mL/Gal.	3mL/Gal.	4mL/Gal.	4mL/Gal.	4mL/Gal.
Great White		Great White	Great White	Great White				
1 scoop/ 2 Gal.	1 scoop/ 2 Gal.	1 scoop/ 2 Gal.	1 scoop/ 2 Gal.	1 scoop/ 2 Gal.				

5mL = 1teaspoon

15mL= 1 Tablespoon = 3 teaspoons

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