Preparing Your Own Hydroponic Nutrients : A Complete Guide for Beginners

Chances are that if you are into hydroponic gardening and you live in Europe or in the US you have been buying your nutrient solutions from one of the many hydroponic nutrient sellers available locally. Generally people do not prepare their own nutrients because they consider this task “terribly difficult” and they prefer to keep buying previously made formulations so that they don’t have to deal with the technical problem of making their own fertilizers. What most people don’t realize is that the profit margin of hydroponic nutrient producing companies is HUGE. You would be surprised to know that each one of those concentrated nutrient gallons you buy costs only a few dollars to make (sometimes even only pennies) and you are probably paying a few times what the whole fertilizer is worth.

Obviously if you are going to be growing plants for a long time or if you simply want to grow a large garden the buying of this commercial nutrient solutions is not an option and starting to make your own formulations – adjusted to your own needs – becomes the main priority. On today’s article I will be speaking to you about how to prepare your OWN solutions using my nutrient solution calculator, carefully explaining to you what you need, where to buy it and what you should expect. I will guide you through making your own first A+B solution by YOURSELF getting all the chemicals and utensils you need easily and economically.

So what do you need to make your own nutrients ? The list below shows you the things you will need to start making your own A+B solutions. You will notice that you will need two scales since we are going to have to weight two “nutrient

sets" with different precision, micro nutrients (which are used only in small amounts, need to be weight more precisely) and macro nutrients (which are used in larger amounts and therefore need scales with larger capacity).

Note, the links below are amazon affiliate links. This means you help out this blog by buying through these links at no extra cost to you.

- Scale that can weight down to 0.01 g at a +/- 0.01g precision (something like this is perfect) with a max weight >100g.
- Two Empty one gallon containers with caps
- Plastic Spoon
- Plastic small container (to weight salts)
- A source of RO or distilled water (your tap water will NOT work)
- Download my hydroponic nutrient calculator here.

Now these are the chemicals you will need (an online purchase link is included for each one) :

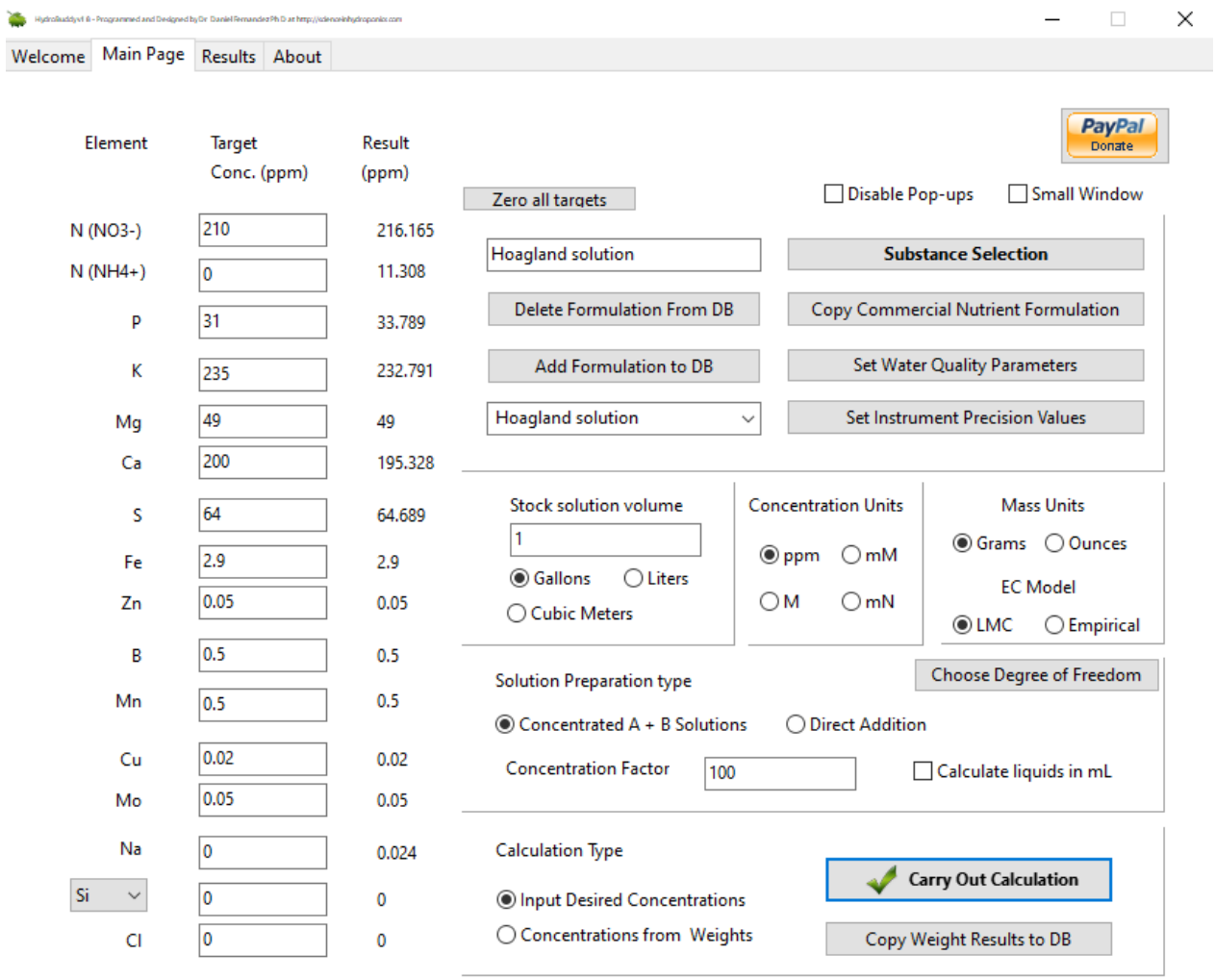
- Calcium Nitrate (here)
- Magnesium Sulfate Heptahydrate (here)
- Potassium Nitrate (here)
- Copper Sulfate Pentahydrate (here)
- Mono potassium phosphate (also known as Potassium Monobasic phosphate) (here)
- Manganese EDTA (here)
- Zinc Sulfate Monohydrate (here)
- Sodium Molybdate (dihydrate) (here)
- Boric Acid (here)
- Iron EDTA (here)

These chemicals can be bought in a variety of places but there is a link next to each one showing you a link where you can actually make the purchase. Often it is also possible to get these chemicals on ebay. The purity may not be as guaranteed

as when purchased from a regular supplier but it is good enough for practical purposes in hydroponics.

Of course you may see right now that the initial investment might be significant (from 100 to even more than 500 USD depending on whether you buy 50lb or 1lb quantities of macro nutrients) however after this purchase you will be able to produce more than one hundred gallons of concentrated A+B solutions which would cost you more than 10 times the price you will be paying if you bought them commercially. After doing the math you will see that this is a GREAT way to save money and produce your own solutions ! Hey you could even start selling to the neighbors !

After you buy the chemicals, open my hydroponic calculator and select the “Hoagland Solution”. Then click the “Concentrated A+B Solutions” radio button and make sure you select the “Input Desired Concentrations” option. Set the amount of stock solution volume to 1 and the radio button to “Gallons”. Then click the “Substance Selection” button and make sure you add all the substances that are from the above list into the “Substances Used for Calculations” list. Now click the “Carry Out Calculations”. Your screen should look like the picture shown below .



This is how the calculator should look after you click the “Carry out Calculation” button. Note the selections that are active.

Now that you have calculated the weights needed you should go to the “calculation results” tab where you will be able to find the weights of the different nutrients you need to prepare the solution in the amount you specified. The results of the calculation to prepare 1 gallon of A and 1 gallon of B stock solutions are shown below.

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Substance Name [click for url]	Formula	Mass (g) [Edit to fine-tune]	Preparation Cost
B - Copper Sulfate (pentahydrate)	CuSO4.5H2O	0.03	0
A - Iron EDTA	Fe(EDTA)	8.444	0.5
B - Mn EDTA	MnEDTA	1.456	0.1
A - Calcium Nitrate (ag grade)	5Ca(NO3)2.NH4NO3.10H2O	389.156	3.1
B - Zinc Sulfate (Monohydrate)	ZnSO4.H2O	0.052	0
B - Boric Acid	H3BO3	1.083	0
B - Sodium Molybdate (Dihydrate)	Na2MoO4.2H2O	0.048	0
B - Magnesium Sulfate (Heptahydrate)	MgSO4.7H2O	188.119	0.4
B - Potassium Monobasic Phosphate	KH2PO4	56.202	2.5
A - Potassium Nitrate	KNO3	186.121	4.1

Element	Result (ppm)	Gross Error	Instrumental Error
N (NO3-)	216.165	2.9%	+/- 0%
K	232.791	-0.9%	+/- 0%
P	33.789	9%	+/- 0%
Mg	49	0%	+/- 0%
Ca	195.328	-2.3%	+/- 0%
S	64.689	1.1%	+/- 0%
Fe	2.9	0%	+/- 0.1%
Zn	0.05	0%	+/- 19.3%
B	0.5	0%	+/- 1%
Cu	0.02	0%	+/- 33.7%
Mo	0.05	0%	+/- 21%
Na	0.024	0%	+/- 0%
Si	0	0%	+/- 0%
Cl	0	0%	+/- 0%
Mn	0.5	0%	+/- 0.7%
N (NH4+)	11.308	0%	+/- 0%

Total Cost is 10.7

Values calculated for the preparation of 1 gallons of A and 1 gallons of B solution. Please use 10mL of A and B within every Liter of final solution

Predicted EC Value

EC=1.81 mS/cm

Stock Solution Analysis

Nutrient Ratio Analysis

Detailed Per Substance Contribution Analysis

Export To Csv

Amounts of salts to be weighted to prepare 1 gallon of A and 1 gallon of B solution.

You should now follow these steps to prepare the solution:

- Mark one gallon container with an A and the other with a B. One gallon will contain all the A salts, the other all the B salts.
- Fill each one gallon container with half a gallon of RO or distilled water
- Weight one salt on the plastic container you set apart for measuring. Make sure you always DOUBLE check the weights and the appropriate A or B gallon container you need to add the salt to.
- After you measure the salt transfer it to either the A or B gallon container (depending on which one it should go into). Use a little bit of water (RO or distilled) to

transfer any remains that cannot be easily added and dry the container you are using to weight before measuring the next salt.
- Shake the container where you added the salt and make sure it is fully dissolved before measuring and adding the next one.
- Do the same as above for all the salts
- After you are done adding the salts add half a gallon of water (again RO or distilled) to each container
- Then seal the containers and shake them vigorously
- You have just prepared your first batch of self-made nutrient solution !

The above formulation is a general multi-purpose blend – a Hoagland solution – that should allow you to grow a large variety of plants. You simply need to add 10mL of A and 10mL of B for each final LITER of nutrient solution. You should use your pH meter and EC meter to adjust these values as you do with your regular commercial nutrients.

It is very important now to keep your solid chemicals stored in air-tight container in a dark and cool place. Some chemicals like calcium nitrate will absorb moisture and become useless if you leave them in contact with air for prolonged periods of time!

Of course, once you are more comfortable with preparing your own nutrients you can research the available literature for some custom formulations available to grow each one of your plants under its favorite nutrient levels. I hope this tutorial has allowed you to reach a new level in your hydroponic gardening experience, hopefully accompanied by a drastic reduction in your soil-less gardening costs !

Make sure you also checkout this youtube video for a similar tutorial using a premade chelated micronutrient mix.