Hydroponic vs Soil… What's the Hub-Bub??

So, for many years I've dreamed of changing careers and becoming a full time author and farmer. Nowadays, I guess you'd call it homesteading. As far back as I can remember I've wanted to do those two things. To that end, err, both ends, I do a lot of research. Now, I'm continually moving closer and closer to the full time author bit. I mean, these articles and this website is testament to that. However, my goal, all along, as far as the 'farmer' career was concerned was to utilize both soil and hydroponics. I would grow fresh yummy organic heirloom produce and herbs via both mediums. What's not to love about that idea?

Apparently a lot.

Most of what I'm finding is that ever since the USDA chose to own and 'define' the term organic, they, and the many commercial lobbyists (BigAg), have gone out of their way to make sure that one of the defining characteristics of anything deemed organic was that the item grown MUST be grown in soil.

I'm sorry? What?

I came across **several** articles that espoused the following (the quoted text noted below in italics is attributed to an article titled Organic Hydroponic Crops? Not in My Opinion… read it if you're feelin' froggy):

> *As with hydroponics, the development of organic farming was all about supplying nutrients to plants. When the founders of organic farming and gardening saw the diminishing fertility of soils managed with chemical fertilizers, and the malnourished crops coming from those soils, they started thinking about how plants obtain mineral nutrients, and they recognized the need to replenish the soil with organic matter so that mineral nutrients could reliably be held in and recycled by the life of the soil.*
>
> *Many books have been written about organic farming and gardening, but this art and science basically comes down to seeing organic growers as soil stewards – not just users – who are devoted to building and maintaining soil fertility (mineral content) and structure rather than feeding plants from a bag of minerals each season.*

When I read that, you know what I thought? If you wanna be a 'soil steward' why beat around the bush, just say it man... You're a dyed in the wool, tree huggin', dirt farmer!

Hydroponics uses less water, zero herbicides, pesticides, and very little fertilizer... and hydroponic farmers **can** use liquid organic fertilizer too. However, because the plant is grown in a different medium than dirt it can't be considered 'organic'? Sounds like a fresh load of bullshit to me. But I digress.

The author continued:

> *In December 2001, the USDA published its Rule governing practices on organic farms. Before this, while the Rule was being written, the organic community worried that the USDA would create a rule that measures the organic nature of a product with a probe. Instead, the USDA*

> *recognized the true nature of organic growing – an organic soil – and wrote a Rule based on cultural practices rather than on products.*

Sounds like the 'organic community', whatever and whoever they hell that is, whispered in the ear of the regulators to me. I'm seriously having issues with this... here's why. It seems to me that our omnipotent government is picking winners and losers... yet again. Plus, and I type this with a limited knowledge base, but I have done a lot of reading, and I'm not an actual hydroponic farmer yet... As far as I know, the nutrient solution is almost 100% water. The plants in their troughs and buckets absorb the nutrients. You know what you're left with when the nutrients are used? Water!

> *In contrast, hydroponic production systems eliminate ecological balance. Crops are produced nearly in the absence of other biology. Rather than fostering recycling of resources through cultural, biological and mechanical practices that promote ecological balance, hydroponic systems usually try to eliminate bacteria and fungi and basically buy in nutrients and discard waste. An organic production system works with the natural bacteria and fungi and biological processes in soils in a way that fosters cycling of resources and promotes ecological balance.*

Ummm, the whole point of hydroponics is to free the grower from having to worry about disease, pests, mold, etc. Why would you want to introduce that for the sake of being labeled 'organic'? Growing vegetables isn't some sort of Zen like state taught in yoga classes either.

> *Hydroponics has its place and purpose,*

Thanks for that bone…

> *but it is not organic – although gray areas exist.*

He giveth and he taketh away…

> *A soilless mix could be made from compost and other recyclable materials and may meet the parameters of organic farming. Similarly, the Living Machine system that John Todd developed to recycle waste and grow fish and crops may be called hydroponic and it uses elements of organic agriculture.*

Actually, that would be aquaponics. Regardless of my hair splitting, in the end, plants need three things: water, nutrients, and sunlight. Hydroponics is the living embodiment of the argument that they do NOT need soil.

Here's an image with the breakdown of what might typically be found in a hydroponic nutrient solution (ppm). The image was found on the Smart Fertilizer Management website. I'm providing the link so you, dear reader, can do some research of your own.

Hydroponic Nutrient Solutions

Several important factors have to be considered when preparing hydroponic nutrient solutions:

- Water quality - salinity, concentration of potential harmful elements (like sodium, chlorides and boron).
- Required nutrients and their concentrations in the hydroponic nutrient solution.
- Nutrient balance.
- The pH of the hydroponic nutrient solution and its effect on uptake of nutrients by plants.

Common nutrient ranges in hydroponic nutrient solutions

Element	Ionic forms absorbed by plants	common range (ppm = mg/l)
Nitrogen	Nitrate (NO_3^-), Ammonium (NH_4^+)	100-250
Phosphorus	$H_2PO_4^-$, PO_4^{3-}, HPO_4^{2-}	30-50
Potassium	Potassium (K^+)	100-300
Calcium	Calcium (Ca^{2+})	80-140
Magnesium	Magnesium (Mg^{2+})	30-70
Sulfur	Sulfate (SO_4^{2-})	50-120
Iron	Fe^{2+}, Fe^{3+}	1.0-3.0
Copper	Copper (Cu^{2+})	0.08-0.2
Manganese	Manganese (Mn^{2+})	0.5-1.0
Zinc	Zinc (Zn^{2+})	0.3-0.6
Molybdenum	Molybdate (MoO_4^{2-})	0.04-0.08
Boron	BO_3^{2-}, $B_4O_7^{2-}$	0.2-0.5
Chloride	Chloride (Cl^-)	<75
Sodium		<50

Now, say you are an organic soil based farmer. Don't you need to consider where the soil amendment materials originated from? Take for example, manure. Did your manure come from only grass feed, or non-GMO grain fed, anti-biotic and hormone free cattle? No? Then I say you are contaminating the soil. What about chickens. Lemme guess, your chicken manure is only from 'free range' and 'cage free' chickens, where you have personally witnessed the health and conditions with which they were being raised, right?

Mending the soil, or nutrient solution, requires three things and it's always right there on the labeling: Nitrogen, Phosphorus, and Potassium. It looks like 10-10-10, 5-10-5, 8-0-24, etc. Farmers may choose to go the organic route for these materials by implementing manure, compost, sand, straw, Sulphur, lime,

etc. Now, as luck would have it, I DID find an article posted on Mother Earth News that detailed how the city of Montreal commissioned an 18-month study to look into the feasibility of roof top agriculture.

As the article pointed out, the two researchers hired to teach the locals once the money ran out, were organic soil-based knuckleheads. Hauling dirt to a rooftop is a bad idea all the way around. Why? Because Earth is heavy! It didn't take long before they switch to hydroponics for a variety of reason. Here's the link:

http://www.motherearthnews.com/organic-gardening/homegrown-hydroponics-zmaz77mazbon.aspx

What the researchers actually wound up doing was, more or less, called bioponics. In order to adhere to their organic mantra, they needed to create a completely organic solution free of the chemicals allowed by traditional hydroponics. How very interesting:

> *Contrary to prevalent thought, it is extremely simple to mix a batch of organic nutrients adequate for the needs of any plant. One can either use a tea made from high quality compost, or a basic solution of 1 1/2 teaspoons fish emulsion, 1 1/2 teaspoons liquid seaweed, and a teaspoon of bloodmeal to each gallon of water. The mix varies, depending upon the type of plant being grown. Less bloodmeal should be used with flowering and fruiting produce than with leafy crops. Other nutrients can also be added: blended eggshells, for example, might be helpful when added to a cabbage crop. There is room for variation and for more experimentation ... the basic mix is meant to be a starting point rather than a proven end product.*

Find your nose plugs man because I've smelled these organic liquid solutions and HOO-WEE do they reek something fierce. This next paragraph took me aback… because I never really ever take off my preparedness hat:

> *Critics of hydroponics claim that the method is too expensive and too complex. They also claim that it takes the fun out of gardening and is unaesthetic. The latter claim has some validity. Some community residents in Montreal were put off by the boxes of sterile, almost feathery growing medium. Many stressed that they were gardening for more than the potential vegetable yield, that they enjoyed working with dirt and compost. They wanted to learn about earth and they were quite willing to make do with the Intensified* (sic) *problems of container soil for the chance to work with that medium.*

So, are they saying they are willing to possibly starve because they can't work the actual soil? I doubt it, and I understand their quandary. I too like to work the soil. However, the experiment was about production, not aesthetics.

Production is where I want to go and now I have the proof I can be an organic hydroponic bioponic farmer!