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OFF THE GRID HYDROPONICS NO POWER NEEDED (JON WOODWARD)



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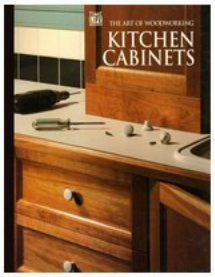

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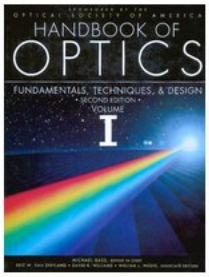

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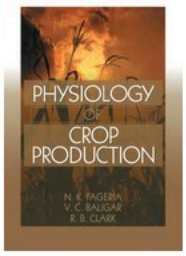

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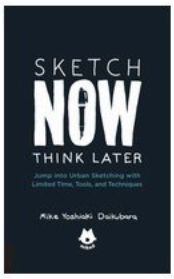

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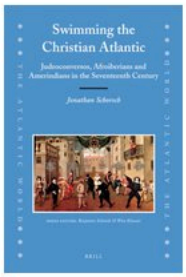

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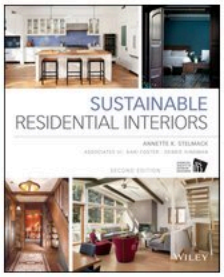

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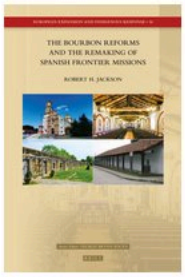

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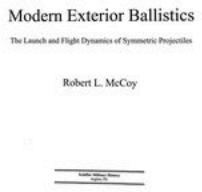

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The Black Death (Rosemary Horrox)


Off The Grid Hydroponics


Off The Grid Hydroponics
By: Jon Woodward

Introduction:

This book was written to explain the Kratky method of hydroponics. The Kratky method refers to growing plants in a nutrient solution as you would in hydroponics however you do not use an air stone and the roots are mostly submerged at all times in the solution. This method is possible with many different plants and works very well for growth. For years it was thought that this would not work as completely submerged roots tend to rot and cause disease in the plant. In this book we will discuss how to use this method to grow all kinds of plants and vegetables. We will focus on off the grid growing. This means without the use of any power for pumps or lights. I have done many experiments with this type of growing and I have been amazed at what is possible. This is a perfect growing method for people new to growing plants as you do not have to water your plants as much and if you follow these steps you will not over water your plants either. Many people can't get plants to grow right because they forget to water or they over water. Over watering is the number one cause of disease in plants.

Hydroponics has often been labeled as too much work and too costly to grow due to lighting costs and attention to nutrient levels. Mr. Kratky has discovered away to eliminate most of the hassle and come up with an easy way to grow plants. I have researched this in great detail and I have tested many different ways of using this system to grow food and other plants. I started out growing Basil in my early Kratky containers. I found that the method not only worked but Basil clones rooted faster and out grew Basil plants I bought on the same day that I planted in soil. The results were amazing. Not just one but every Basil plant I planted using this growing method grew faster, thicker and better than anything I had seen before other than deep water culture or other hydroponic methods. This method of growing plants is not new. Most of the attention into hydroponics goes to systems that use high power lights, water pumps and air pumps. Those systems are also wonderful for growing plants but they require more time and money. I wanted to explore a cheap and easy way to grow food that almost anyone could do even if they did not have any experience growing plants. This is important because our soil quality is getting more and more polluted. You can still buy nice soil at stores but who wants to spend $7.00 for 1 cubic foot of soil. Many people still compost but that also takes time and resources. This method works great with almost no money needed. I will cover how to make this set up and what you will need to do this super cheap or from reused material. I will also so you how to make this set up with a small
investment that can be reused for years and years. I have many that I reuse during the winter time to grow other plants.

“We can grow better food without spending a lot of money on development of super

strains. We just need to learn to grow better. Mother nature will do the rest." - Jon Woodward

Homestead Tomatoes

Jon Woodward



Off The Grid Hydroponics

No Soil or Power Required
By Jon Woodward Copyright 2013

Mission:

My mission with this book it to shed light on the Kratky method of growing plants. My hope is that more people will see how easy growing food can be. You can grow great food without worrying about watering or constantly monitoring your nutrients. I hope to lay out easy to follow instructions with picture to illustrate how anyone can make Kratky off the grid hydroponic systems.

I hope to make more people aware of what they eat by growing more of the things they eat. I know that anyone on any budget can grow plants without spending a ton of money of equipment. I will show you how to use reclaimed material to make your grow set up and I will show you how to make a system that costs some money but looks professional and nice.

About Me:

My name is Jon Woodward. In 1993 I was in high school in Fort Lauderdale, Florida. I attended a vocational school that offered classes most schools did not. I signed up for a 1 hour horticulture class. I also took horticulture in 94 then in 95 I had horticulture for a 2 hour block my senior year. Our horticulture teacher was one of the most dedicated men I have ever met. Joe Korvick would do what ever he need to make learning about growing plants interesting. When I started in the class he had just order an hydroponic drip system. This was the first time I saw hydroponics. I was hooked right away. The idea that you could grow plants inside was something I was amazed by. I have been growing with hydroponics for 20 years now. I have used every type of system from drip systems to deep water culture systems. I have made every type of mistake in growing and I have seen results that most people would be amazed by.

Dedication:

This book is dedicated to Joe Korvick. Mr. Korvick was the horticulture teach at Stranahan High School for over 20 years. Mr. Korvick went above and beyond to teach his students. I may have learned more about life then growing plants. Maybe I just learn how similar we are to plants.

Thank you Mr. Korvick

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Understanding Nutrients

When using the Kratky method in hydroponics your nutrients act as a medium much like soil does. Your nutrients will supply your fertilizer and foods for your plants. I like to buy Fox Farm nutrients because it is easy to get a pre made consistent mix. I have used the same bottle for 3 years. It cost me about $20.00 but you only use a very small amount in the mix.

Now that being said, the free way is also very doable. I have tried many different things for this. I have used lake water as a nutrient mix. I have used creek water. My favorite mis to use is fish tank water. There are a few great reasons for this. One is the fish need the water to be chemical free to live well. Two, the fish waste is perfect for plants. Auqaponics is becoming more popular these days. This is a system of growing fish and plants together. The fish waste feeds the plants and the plants filter the water for the fish. So, using the water from an established fish tank will work well for growing plants. Fish tank water can be easily attained most of the time. If you d not have a fish tank you can find a lake or creek that will have some fish related waste in it and will work well 80% of the time. Make sure your not using water from a polluted lake or river. Look for signs on high levels of fish deaths on the banks. This is a dead give away that the water will not do you any good.

If you are using a pre made nutrient mix remember that most of them are salt based. This is important because you will need to add water about once a week to keep your water levels right. Don't panic... I know I said you do not need to worry about watering. You don't. If the water level gets too low it will not kill your plants. It will not even hurt your plants unless you don't add water for a month or so. Outside in 90 degree temperatures you will see more water loss. So as you add more water the salt level will rise. I add pure water most of the time. About once a month I will top off the system with nutrients.

Follow the directions on your nutrients. Over doing it will cause nutrient lock or kill your plants buy burning them. Once you get nutrient lock your plant will not take in nutrients anymore correctly. If you are using fish water you do not have to worry about this. Mother nature has made it easy. The fish make the water just right for the plants. If you are using a newer fish tank you may see higher levels of ammonia in the water. Any fish tank will likely have an ammonia tester with it. Test for it if you can. Some

plants will not like a high level of ammonia.

Understanding Roots

Plant roots need air. I know the idea that these things are are buried underground need air seems crazy. This is why Kratky hydroponics works. You do not want to cover all the roots with water and nutrients. You only want the water lever to cover about 25% of the bottom of your net pot. As the roots grow in you will need to lower the water level to just below the bottom of the net pot. Some roots will still dangle down into the water. This is why you do not have to worry about watering as much. As long as some of the roots are touching the water the plant will get nutrients and the roots will have air.

Roots are delicate. Always be careful when handling the roots. Avoid touching them if possible. Everything on your hands will get pulled into your plants. Also the roots do not like temperature changes. You would not want to top off your container with freezing water. If you stress the roots you will stress the plants weakest link. Healthy roots will always equal bigger yields and happier plants.

When growing in a hydroponic medium you want to look at your roots for the overall health. You are looking for white thick roots. The roots should be much thicker than normal roots would be. This is why hydroponic plants grow so much faster and better. Many people have speculated that the grow is more than double a soil based plant. I would agree with this based on what I have seen. In a Kratky setup there is no air stone so your root will not be a white as a deep water culture system. This is ok since the size and overall health is still great. We want to get nutrients into the plant but we do not want to over do it.



Lighting

Lighting is an easy one.

Expensive:

High pressure sodium and Metal Halide lighting will cause plants to grow. These are good because you can grow anything all year around. The down sides are heat and

money. These lights can use between 200 and 1000 watts per hour depending on the size. They also put out a ton of heat. Yes, you can vent the heat out with hoses and holes in your walls but it is not that needed if you choose other lighting. A florescent T5 lighting system will set you back some money but it does not put off heat very much and with cause excellent growth. T5 lights are not good for tall plants as they need to be close to the plant. They work great for pepper plants that are not too big.

Cheap:
These are awesome. CFL or compact florecent bulbs will not put off much heat and they will cause growth in most plants. You will need to get the lights close to the plants but they are not as big as T5 tube bulbs so this is much easier. You local home store will have some larger 150 watt equivalent bulbs that work great for most any plant. I have growth stuff all winter long under these bulbs. At about $20.00 per bulb they are worth it. I also use the dome shaped reflectors you can buy at the home store of Wally world. These direct heat and light towards your plant. The bulbs do not use much electricity so you can leave them on a 24 hour light cycle without breaking the bank.

FREE!
This is my favorite type of lighting. Off the grid and 100% free. You can adjust the brightness and nothing will cause better growth. The sun. The sun is best used during the growing season. I grow plants for free food so I like to grow everything I can during the grow season and freeze what I need. We also are getting into canning food for later but freezing is hard to beat. The flavor is still very fresh when frozen. You can move some plants under a tree if they do not like a ton of light. You can put some inside in a window if they need less heat but still want the light.

I can not say enough about the power of the sun. If you enjoy being off the grid (unplugged from the power company) then you understand the sun provides electricity and warmth. Solar showers will collect rain water and heat the water in a black metal tank in the sun. Solar panels will produce power that can be stored and used later for lighting and charging gadgets. 12 volts will run all sorts of things but we still for some reason use 120 volts because that is what we are sold. I will not get off on a rant. Just know that the sun provides everything we really need, you just need to know how to use it.

When growing with the sun you need to keep an eye on your watering so that your plants stay happy. However when using the Kratky hydroponics method you do not have to worry about it much. I will go into great detail in the chapter about watering.

Watering

Nothing hard here. You will get the water level to the right spot in the beginning. In the