

# “Set It and Forget It” Hydroponic Lettuce<sup>1</sup>

Hannah Eason<sup>2</sup>



Video 1. Hydroponic Lettuce. (See end of publication for video transcript.) <https://www.youtube.com/watch?v=GQey35Tt24I>  
Credits: Videography by Kurt Slafkovsky with Seminole Government Television; demonstration and voice by Hannah Wooten, UF/IFAS.

Hydroponics can be as simple as making a microwave dinner or as complex as operating a Michelin Star restaurant. Water and land use are extremely efficient in hydroponic systems, making the method well-suited for urban food production, personally or commercially. The method shown is intended to present one of the simplest, most affordable ways for hydroponic growing so you can get your feet wet and determine if you want to grow your own food or stick to the grocery store. The intended audience for this introductory hydroponic growing method includes curious gardeners, time- or space-limited gardeners, teachers, small-scale urban farmers, and innovative growers looking to learn more about hydroponics.

“Set it and forget it” hydroponic lettuce sounds too good to be true. University of Hawaii’s Dr. Brenard Kratky

demonstrates that it is possible to grow plants hydroponically using a simple approach that honors the basic needs of the plant by setting the seedling up for success from the start. Lettuce is an excellent edible plant that is low maintenance, low profile, short-cycle, and delicious, which makes it well-suited for simple, set it and forget it hydroponics.

Set it and forget it hydroponics, more commonly referred to as “the Kratky method” among hydroponic enthusiasts, is a non-circulating method of hydroponic growing, which means the grower does not need electricity to move the water using pumps and aerators. Furthermore, the entire crop can be grown with only the initial application of water and nutrients (Kratky 2009). Once the grower sets up the small-scale hydroponics system in a well-lit location during the lettuce growing season, there is rarely a need to monitor and adjust the pH or nutrient solution. It is simple, affordable, successful, and easy to troubleshoot, which is great for teaching novice gardeners or growers looking to dive deeper into hydroponics.

The following steps use a 5-gallon bucket with a lid. This method can be modified using almost any container that holds volume. Wider containers are better than taller ones so roots can reach water, and food-grade plastics should be considered. You can use a lid to suspend your plants, or you can float your plants on top of the nutrient solution with a foam board as long as there is a little bit of space for airflow to the root zone (Sweat et al. 2016). Just note that each lettuce plant will need 1–1.5 gallons of water from seed starting to harvest, a crucial factor in determining the

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size of the system that will allow the grower to actually “set it and forget it.” This minimal water requirement is another reason lettuce is an excellent plant to use for learning, as well as for classroom and school projects!



Figure 1. Photos of three non-circulating hydroponic buckets with mature plants ready to harvest: (left) Salanova Green Butter Lettuce, (center) Li Ren Baby Bok Choy, and (right) Cherokee Summer Crisp Lettuce. Photo taken in Orlando, FL in 2023.

Credits: Hannah Wooten, UF/IFAS

Hydroponic growing is possible by providing all the basic needs of the plant: light, water, a pH-balanced nutrient solution, structural support, and airflow. Another important factor for success is growing in season, which in Florida is the cool season, school season, ideally from October to March. If sunlight is a limiting factor, hydroponics can be done indoors year-round with adequate lights and a fan. Although this increases costs and adds complexity to troubleshooting, it provides options for growing indoors through hot summers or freezing winters.

The pH-balanced nutrient solution can be made with fertilizers for hydroponic crops. Hydroponic fertilizer formulations contain a few additional nutrients not typically found in fertilizers applied to crops in soil. There are many brands of hydroponic fertilizers. Select a hydroponic fertilizer for leafy/vegetative growth or an all-purpose fertilizer. Liquid, granular, or two-part hydroponic fertilizers are acceptable. Follow the label rate for non-circulating hydroponics or get a meter to measure the electrical conductivity (EC of  $\sim 1250 \mu\text{S}/\text{cm}$ ) or total dissolved solids (TDS of  $\sim 800 \text{ ppm}$ ). The pH typically needs to be lowered, or made more acidic, to a range of 5.5–6. The common household item, white distilled vinegar, works well for lowering the pH of the nutrient solution to the optimal range for nutrient uptake.

Finally, growing plants can spark curiosity and discovery, which is good for the human spirit! This method of hydroponics lends well to experimental approaches. Try other edible plants that are short-cycle, low profile, and delicious, such as baby bok choy. Dr. Kratky explored more crops in bigger non-circulating systems, such as tomatoes

and cucumbers. While it is possible to grow bigger plants in a bucket, there are other intermediate and advanced hydroponic techniques that are better suited for flowering and fruiting crops. (For more information, see the hydroponics topic on Ask IFAS at <https://edis.ifas.ufl.edu/topics/hydroponics>).

## Step-by-Step Guide

### Materials

- 5-gallon bucket and lid
- 2-inch hole saw
- Drill
- Permanent marker
- Hydroponic nutrients
- pH down (or white distilled vinegar)
- pH strips or pH meter
- Optional—Electrical Conductivity/Total Dissolved Solids meter (EC/TDS)
- Lettuce seeds
- Container with clear lid
- 2-inch net cups
- Rockwool or Oasis grow cubes
- Stirrer
- Teaspoon

### Instructions

1. Soak the grow cubes until saturated.
2. Insert one to two seeds per grow cube.
3. Keep the seeds germinating in the grow cube in a covered container with some water and high humidity, and then once the seedlings have emerged, transplant them into the bucket. Alternatively, start the seeds in the bucket, helping to maintain high moisture levels while the seeds are germinating. Seedlings will be ready to transplant after one to three weeks.
4. Using permanent marker, trace a net pot on the bucket lid in three places.
5. Place the lid on the bucket and gently guide the drill into the lid in the three marked places.
6. Place a net pot in each hole.
7. Determine bucket location with ample light.

8. Fill the bucket with water until it is halfway up the net pots. Note that the bucket will be heavy and hard to transport once full.
9. Optional—Measure the EC or TDS of the water with a meter (recommended if interested in more advanced techniques).
10. Add nutrients to the water, typically ~1 teaspoon/gallon, to reach a total EC of ~1250  $\mu\text{S}/\text{cm}$  or TDS of ~800 ppm. Check the nutrient label.
11. Measure the pH of the solution.
12. Adjust the pH to ~5.5–6 by adding white distilled vinegar to the solution, typically ~2 teaspoons/gallon, depending on the water source.
13. Place the lid on the bucket.
14. Place seedlings in the net cups in the lid. Ensure the seedlings make contact with the nutrient solution.
15. Set it outside in a sunny location during the lettuce growing season, October through March in Florida.
16. Forget it until you are ready to harvest your lettuce!

## For More Information

Ask IFAS Topic Page for Hydroponics: <https://edis.ifas.ufl.edu/topics/hydroponics>

Ask IFAS Topic Page for Lettuce: <https://edis.ifas.ufl.edu/topics/lettuce>

EDIS Publication #HS943, “Building a Floating Hydroponic Garden”: <https://edis.ifas.ufl.edu/publication/HS184>

EDIS Publication #HS1422, “Growing Lettuce in Small Hydroponic Systems”: <https://edis.ifas.ufl.edu/publication/HS1422>

UF/IFAS Extension Orange County Blog, “Set It and Forget It Hydroponics”: <https://blogs.ifas.ufl.edu/orangeoco/2020/04/09/set-it-and-forget-it-hydroponics/>

## References

Kratky, B. A. 2009. “Three Non-circulating Hydroponic Methods for Growing Lettuce.” *Acta Horticulturae* 843: 65–72. <https://doi.org/10.17660/ActaHortic.2009.843.6>

Sweat, M., R. Tyson, and R. Hochmuth. 2013. “Building a Floating Hydroponic Garden: HS943/HS184, Rev. 6/2013.” *EDIS* 2013 (6). <https://doi.org/10.32473/edis-hs184-2003>

## Video 1. Transcript

### Introduction

[Banner introduces speaker, Hannah Wooten, an Extension agent of sustainable agriculture and food systems at UF/IFAS.]

Hydroponics can be a great, easy, and affordable way to grow your own food! Today, I’m going to show you how you can grow great-looking lettuce, just like this [Shows lush, green lettuce crop], hydroponically at your own home. All you have to do is set it and forget it!

[Music playing. Title slide shown, “Set it & Forget it Hydroponic Lettuce.” Logos appear for UF/IFAS Extension and Seminole County.]

### Starting Seeds

The first step for growing your hydroponic lettuce is going to be starting your seeds. Here, we’re going to be using these Oasis grow cubes to get these seeds started. You’re going to start by soaking those grow cubes in water and getting them completely saturated, just like this. [In a small plastic container of water, Wooten completely submerges the grow cubes for a few seconds.] Once your grow cubes are completely saturated, you can remove them and prepare them for planting with seeds. Today, we’re going to be using green butter bib lettuce. These are pelleted lettuce seeds, which just makes handling a little bit easier.

With fresh seeds, you can just place one seed per cube. But if your seeds are a little bit older, it might be a good idea to place two per hole. Now that we’ve planted our seeds, they’re going to be ready to germinate, so you’re going to put them back into a container [the same container used to soak the grow cubes]. We’re going to reduce the amount of water in that container because we don’t need it to flood the seeds completely, but we do want them to have some water and some high humidity. Place those seeds in the container, cover it to keep that humidity high, and we’re going to wait about two to three weeks while these seeds turn into little baby seedlings, where we will then transplant them into our buckets.

## Building Your Bucket

While your seeds are in germination, you're going to have a little bit of prep to do. So right now, we are going to drill some holes in our 5-gallon bucket. We are using a power drill with a two-inch hole saw drill bit to drill out the holes in the lid of our bucket. We're going to be drilling out three holes today so we can plant three heads of lettuce. It's good to stabilize the bucket and stabilize the drill using a little bit of pressure here, just like that. *[Wooten touches one side of the bucket lid with the drill where intending to make a hole, and then she places one foot on the opposite side of the bucket lid. Once the bucket is stabilized, Wooten drills the hole.]*

## Making the Nutrient Solution

When your lettuce seedlings are ready, it's going to be time for you to make your nutrient solution. There are going to be a few steps involved in making a proper nutrient solution for your lettuce. First, you're going to fill up your 5-gallon bucket with water, almost to the top but not quite. You want to leave about an inch of space; that's going to provide the air necessary for your lettuce roots to grow successfully. In order to make a proper nutrient solution, we need to add nutrients to the water because that's how the plant can have a healthy, balanced diet. But we also need to balance the pH or the acidity of that nutrient solution so the plants are able to access those essential nutrients.

These are some fancy meters that you can buy to measure your pH and the amount of nutrients in your hydroponic solution. But today, I'm going to teach you how to make those measurements with teaspoons and with very affordable pH strips. It's a good idea to go ahead and test the level of your pH first so you know where you're starting. We're going to use these very affordable pH indicator strips. Where you just put it *[one strip]* in the water, lay it to compare the color *[against the key which corresponds pH levels with strip color]*, and you can see we have a pH of about 7 right now; that's neutral. We want a pH that's in the range of about 5 ½ to 6. So now we're going to add our nutrients. The nutrients are going to help to lower the pH a little bit. Then we're going to add our vinegar to drop the pH to our desired range of 5 ½ to 6.

So we're going to start by adding 5 teaspoons of the nutrients.

*[Music playing. Wooten pours liquid plant food into a teaspoon. Text on screen notes the measurement of 5 teaspoons per 5 gallons.]*

And now we're going to add 10 teaspoons of the vinegar. This is white distilled vinegar.

*[Music playing. Wooten pours vinegar into a teaspoon. Text on screen notes the measurement of 10 teaspoons per 5 gallons.]*

Now, I'm just going to give it a quick stir to evenly distribute the nutrients and that acidic vinegar throughout the solution. Now let's see what our pH looks like. *[Wooten uses the pH strips to test the solution again. The color of this test strip has noticeably changed from the initial test strip.]* Looks like we're right there between 5 and 6.

## Placing the Seedlings

Now that our nutrient solution has been pH balanced with our nutrients added, it's going to be time for us to place our seedlings, which are now about two to three weeks old.

Now we're going to take that lid that we drilled those three holes in with the 2-inch hole saw and we're going to place it on the top of our bucket. And we are going to take these 2-inch net cups to place in these 2-inch holes. You can see that the water level is up about halfway on these net cups. That's important so that our seedlings can remain in contact with the nutrient solution so that they can get off to a good, healthy start in this bucket. Now we're going to take these seedlings; you can see they're already rooting out here. And we're going to place them right here into our nutrient solution. *[Wooten sets each seedling, root first, into the net cups].*

## "Set it and Forget it"

At this point, your lettuce is going to be ready to set outside in a sunny location in whatever months are your lettuce growing season. Here in Florida, that's going to be in the fall, the winter, and the beginning of the spring, where your lettuce can grow happily and healthily outside. Your lettuce is going to be growing outside for about another three, maybe four weeks, and then your lettuce is going to look like these examples over here. *[Pictured are two buckets with lush, green lettuce crops growing hydroponically from each.]*

Now the real trick with the success of "set it and forget it" lettuce is that those seedlings that you started over here are going to push their little roots right down into the water and nutrients. *[Wooten lifts the bucket lid from one of the successful crops, showing long and dense roots hanging underneath.]* And while your plant is actively growing and taking up that water and nutrients, that water level is going down. So, you really can just set it and forget it.

## Harvesting

Now your “set it and forget it” lettuce is going to be ready to harvest, but don’t forget to harvest it! I know your lettuce looks very beautiful and it’s tempting to want to just show it off to everyone, but now you’re going to want to harvest your lettuce so that you can enjoy what you’ve grown over the last few weeks. So here we’re just going to take some scissors, we’re going to harvest this whole entire head today, and we’re just going to cut at the base of the lettuce plant.

*[Music playing. Wooten cuts and gathers the lettuce.]*

We’re going to move that lettuce right here to a bowl where it’s ready for dressing!

*[Music playing. The camera zooms in on the harvested lettuce.]*

## Conclusion

I hope you found the “set it and forget it” hydroponic method to be an easy, affordable, successful, and delicious way to grow your own food. I’m Hannah Wooten with the University of Florida IFAS Extension in Seminole County. If you would like some more information, please feel free to reach out. Thanks and have a great day!

*[Music playing only. A still image shows three buckets, each with a lettuce crop growing from the lid at different stages. A banner offers Hannah Wooten’s email for more information: hwooten@ufl.edu. END.]*