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# Growing Basil in Hydroponics? Read This First

by Amy Storey | Dec 22, 2016 | Crops & Growing Science | 16 comments



Basil is a well-loved crop in almost every community.

Dwarf basil in the first ZipGrow experimental greenhouse. Dwarf basil has smaller leaves and is bushier than most varieties.

The woody herb can be sweet, savory, or peppery, and it smells amazing. Basil has been used some way in almost every place in the world and has collected its own interesting history throughout the ages. (For a century or two, basil was thought to spawn scorpions.)

Basil belongs to the mint family (*Lamiaceae*), along with rosemary, oregano, thyme, and several other popular herbs.

Our favorite basil varieties are the classic sweet basil (*Ocimum basilicum*), Genovese basil, Thai basil, and dwarf basil. Sweet basil is a favorite among the Upstart Farmers.

Herbs are much more profitable than leafy greens, and can be a fantastic crop line for market growers. The pricing you receive will vary depending on your market. For example, Direct to Consumer markets like a CSA can often see prices as high as \$2 or \$3 an ounce, while wholesale markets like restaurants may land in the \$1 to \$1.50 an ounce range.

A recent price check at Target revealed that a 3/4 ounce clamshell package was retailing for \$2.00, which comes out to \$2.66 an ounce at the point of sale. A general rule of thumb is that wholesale pricing will be 40% to 50% of retail price.

# REFERENCE CARD: BASIL



*(Ocimum basilicum)*

- **Most common pests & diseases:**

Pests include nematodes, aphids, thrips, flea beetles, white flies, and snails/slugs. Diseases include damping off, root rot, leaf spot diseases, fusarium wilt, and downy mildew

- **EC/PPM:** 1.6-2.2

- **pH range:** 6.2-6.8

- **Planting:** From seed or transplant

- **Harvesting:** Prune apical growth to cue lateral growth

- **Yield:** 3-4 lbs / Tower

- **Temperature:** 70-85°F

- **Light:** Full sun / 14-18 hrs



[Download \(PDF, 125KB\)](#)

## Ideal conditions

- EC: 1.6-2.2
- pH range: 5.6-6.6
- Temperature: 65-95°F

If mint scores a 1 in difficulty (it's quite easy to grow), then woody herbs like basil are at the other end of the scale. Although basil isn't needy in terms of water and pH, it does require pruning (see below) to achieve full yields and grows best in high temperatures which can be tough to match with other crops. When you can achieve ideal conditions, you'll be amazed at the growth you can get from your basil crops.

Matt Marsh is [a basil farmer in North Carolina](#). Over the last year, Matt has focused on growing high quality for his community above other crops and has several tips for new basil growers.

**1. Control humidity:** The shape of basil leaves tend to catch water and hold it, so controlling condensation is very important. High humidity (above 70% for extended periods) has been problematic for us. We try to keep our humidity between 40-60% in the greenhouse. I haven't seen any issues with running a lower humidity throughout the day but the basil transpires heavily in the dark periods. We haven't seen low humidity for longer than 12-14 hours at a time.

\*Good air flow but not a lot of "wind" on the plants. Basil is very sensitive.

**2. Light:** Have a supplemental lighting option! We are currently fighting to fill orders because this winter has been much lower in light. Our basil grows decently with 10-12 hours of light but that is on the low end of weight per tower at a 5-week cycle. Supplementing light is almost a guarantee. We didn't supplement light for the first year and got away with it because our demand wasn't consistent. Now that everyone looks to us for basil, we have had to do "harvesting gymnastics" to keep everyone happy.

**3. Diligently manicure:** We have always had random dying leaves (damaged, blocked from light, etc.) on the plants. We have learned to go through and pull as many off as we see because they have always affected the leaves around them in some negative manner. Some stick to the other leaves and damage them, others become a sponge and drip onto the other leaves, and others grow fungus. In short, clean around the plants well.

**4. Prune:** We have used harvest time as a way to prune plants that are end- or top-heavy. If the growth on the end of the stem is too heavy, it will split from the main root base and become bitter. If the stem/root is damaged we harvest immediately or throw it out.

We have eliminated all of our bitter basil by:

- harvesting before bolting to flower
- throwing out any old/tough growth
- removing broken stems

\* Do not pinch. Invest in sharp sheers! You will damage or pull off a whole stem more often than you think!

Harvesting basil – how to cue apical growth

Basil has been bred to

be a single-stemmed plant growing upward.

For most growers, a bushier plant is better. A pruned plant looks better, yields more, and can be easier to transport depending on your growing method.

Upward growth is called apical growth. To change the way that basil grows, growers can trigger a secondary type of growth that moves outward and up instead of straight up. This is called lateral growth.

A young basil plant (say 5-10 inches tall), has buds on the side of the stem that haven't grown out yet. Those are the lateral buds; they're the back-ups that will only grow if the main stalk gets badly damaged or removed.

This means that if growers clip the stem right above those lateral buds (a half inch or so), the buds will be triggered to grow out. By pruning basil this way, growers can increase the production of that branch and control the shape of the plant.

When you go to harvest your basil for the first time, you'll probably notice multiple pairs of lateral buds on the plant. Cut the plant above the second pair of buds. Matt explains why:

"We cut down to the second 'Y' in most cases. Any leaves above that split on the stem will be harvested. I used to cut down to the first 'Y' but it made the growth so tight that I had issues with moisture being held inside within the collection of leaves. So, moving out the second has fanned out the growth enough that it doesn't stop airflow, light penetration, etc..."

If you prune a basil plant correctly, then you'll see an increase in yield each time you harvest for the first three harvests (around weeks 5, 8, and 11).

### Post-harvest care of basil

Several times now, we've had a conversation that goes like this:

"I brought a crate of basil cuttings to the chef at the restaurant I service. The next day, I got a call from him saying that the basil had gone bad! That's impossible... I had just harvested it."

Every time something like this happens, we ask, "did he put it in a cooler?" and always, the answer is yes. Usually, coolers are kept at 40-45° degrees, but basil doesn't have the cellular machinery to deal with those

temperatures. A few warm-weather crops respond to cold temperatures with rapid decay.

To extend the shelf life of basil, store it above 55° F (preferably at a temperature of 60°). At this temperature, it can attain a shelf life of 12 days. Instead of cooling the basil, keep it in a higher-temperature cooler, or on a counter in a cool room. For home consumers, a jar of water on a counter works great.

If growers package basil in bags or cartons that reduce moisture loss (plastic with little or no air exchange), be sure to keep storage temperatures steady to avoid condensation. Matt has had success with vented bags:

“We use vented bags and keep the basil out of sunlight at all costs! Our restaurants keep the bags in dry storage of some sort and most just hang the bags in the kitchen away from heat and certainly not in the cooler! If the restaurant has a wine cooler it is usually kept around 60-65F and can be a great place to store it.

“If we have issues with moisture in the bags we have will put a paper towel in the bottom but our best solution is to do 2 deliveries per week (only accounts at 2lb/wk or more). Costs us more but they never have bad basil.”



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What if customers don't listen to you and still store it in a cooler? Matt has solved this problem by providing a test bunch free of charge so that customers can see the results themselves.

"I've had stubborn customers who put the basil in a cooler and I'll gift a bag of basil (usually .5 lb) and have them sit it out where I decide for a full week. Our record... 100% of them begin keeping the basil in that area after the test

run.”

Handle basil gently, as bruising can increase the rate of deterioration. Many Upstart Farmers have found that selling basil packaged in clamshells is helpful for preserving the herb.

>>> [Read more on tips for post-harvest care of herbs](#)

Get ready. Get set. Grow.

Upstart Farmers can grow incredible basil to serve to their communities, and it’s definitely a worthwhile herb! Leave comments if you have questions, and don’t forget to [check out our other crop posts](#).

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How to Grow Hydroponic Cabbage: The Beginner's Guide



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**Evan** on December 23, 2016 at 8:40 pm

Great article. Where have you found luck sourcing the vented bags?

Reply



**Amy Storey** on December 28, 2016 at 10:54 am

Evan, glad this was helpful – thanks for reading!

Matt uses a local supplier for his harvesting supplies because he can try out new products quickly and saves himself time in researching each product. (He recommends this to new growers as well.) He actually just switched to a draw-string plastic bag because he can fit it into a 5-gallon bucket, harvest directly into the bag, and save labor time.

Reply



**Ryan Witten** on March 27, 2017 at 2:22 am

Hi Amy, is Matt still using the drawstring plastic bags? These could be very handy on our farm.

Reply



**Amy Storey** on March 27, 2017 at 8:42 am

Hey Ryan, I believe so. If you're looking for suppliers, I'd throw the question out in the Upstart U Community on Facebook. Other farmers might have recommendations.

Reply



**Andrew** on December 24, 2016 at 2:59 am

Great article

Reply

**Maxime Viau** on December 25, 2016 at 6:40 am



The PDF document on sale on your website has other values for PH and EC. Are the ones on the blog the best one or the one in the PDF?

Thanks

Reply



**Amy Storey** on January 3, 2017 at 4:09 pm

Hi Maxime, thanks for the heads up on that inconsistency! These are a bit more conservative so stick with the ones here.

Reply



**Andy B** on March 3, 2017 at 10:17 am

I have a question on how to read the reference cards...harvesting for basil is done 8-10 weeks from transplant or from seed? Not sure how the timeline should be read.

Reply



**Amy Storey** on March 3, 2017 at 2:30 pm

Hi Andy, it's the age of the plant – so you can do the first harvest when it's 8-10 weeks old. This usually ends up being about 6 weeks after transplant, depending on the conditions.

Reply



**Andy B** on March 4, 2017 at 3:05 pm

Thank you Amy!

Reply



**Raymond N.** on August 12, 2017 at 10:33 am

Forgive my confusion, I am very new to this. We are in the works of

developing our business plan and want to try and define a more accurate cost analysis/production estimates. We are working with some small restaurants and not sure of the scale to start at. In the Zipgrow production estimate pdf, the chart shows that at week 5 (on a 5-week turn) there is an estimated 3-4 lb harvest per tower. My question is, would you be constantly harvesting throughout the harvest life (5 weeks) of the plant or would you only have three total cuts? Thank you for your time in advance. You guys really are doing a great job providing very useful information.

Reply



**Amy Storey** on August 24, 2017 at 3:33 pm

Hey Raymond. The numbers in the estimates are for once only at the listed intervals, rather than a little bit each week.

Reply



**Ken** on March 26, 2017 at 7:30 pm

Hi what do you recommend for your hydroponic system? Is it simple enough to build yourself or is there a prebuilt system you recommend?

Reply



**Amy Storey** on March 27, 2017 at 8:34 am

Hi Ken, the type of system you use depends on your space, climate, and growing goals. There are several turnkey systems that work for basil as well as DIY-type systems. A Bato bucket system will be more hands-on, while a Farm Wall is more of a ready to go kit. If you're tossing around pros and cons of different growing techniques, I recommend the "Choosing Your Production Technique" course.

Reply

**tylor** on January 5, 2018 at 11:21 am



The pH range in this blog does not match the pH range on the “Reference Card: Basil” (.pdf)

Reply



**Mia Lauenroth** on January 8, 2018 at 7:17 am

Hey Tylor,

The 5.6–6.6 is just a more conservative range. We recommend that one.

Reply

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