

By Christopher J. Currey

# MANAGING BASIL PRODUCTION THROUGHOUT THE YEAR

**Year-round basil production requires proper temperature, light and nutrition management.**

**B**asil is the most popular culinary herb grown hydroponically or in controlled environments. For greenhouse production, basil is most productive from the late spring to the early fall. During the later fall, winter and early spring, basil productivity decreases and growers are left wishing they had more production to harvest and sell. Let's explore how to keep sweet basil productive throughout the year.

## Temperature

Basil is a warm-growing plant (**Fig. 1**) During the fall, winter and spring, cooler outside air temperatures combined with less radiant energy from sunlight will lead to cooler temperatures than during the sum-

mer. The optimal temperature for basil is around the mid- to upper- 80's F and shoot growth is greatest at this temperature. Maintaining greenhouses at that warm average temperature is not feasible. However, it demonstrates how basil is clearly more productive in warm temperatures. It is very tempting to grow cooler during the winter, but try to remember warmer air temperatures will lead to greater yields.

Additionally, don't drop temperatures too cool during the night, either. Basil is sensitive to temperatures below 55° F and while cool night temperatures are also more cost efficient, they can also restrict growth. If multiple zones are available in the greenhouse, basil can be grown warmer in a separate area as opposed to being grouped with leafy crops such as

**AIR TEMPERATURE (°F)**

**52                  63                  78                  84                  95**

Fig. 1. Sweet basil is a warm-growing, cold-sensitive species, with an optimal temperature in the upper-80s. Cool greenhouse air temperatures in the late fall, winter and early spring slow down the rate of basil growth.



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lettuce, spinach, kale and culinary herbs including dill, parsley and cilantro that can be grown at cooler air temperatures.

### Light

While basil growth will slow down in cooler temperatures, diminished light will also negatively affect yield. Basil is a high-light crop, with growth maximized at a daily light integral (DLI) of around 29 mol·m<sup>-2</sup>·d<sup>-1</sup>. Depending on geographic location, the outdoor DLI will not even be this high in the fall, winter and spring, much less inside the greenhouse where light is often 30% to 50% lower than outside. While cooler temperatures will slow down the rate of crop growth, low light limits yield for basil crops. Minimizing overhead superstructure and equipment, and cleaning glazing materials will help maximize transmission of sunlight inside the greenhouse. But supplemental lighting is the only way to increase the amount of photosynthetic light available to basil.

Targeting basil over other culinary herbs in a greenhouse with any available supplemental lighting will be beneficial. But while nearly all culinary herbs grown in a greenhouse benefit from supplemental lighting in the winter, the relative increase in yields from lighting basil is greater and will make for a better return on investment than other culinary herbs.

### Nutrition

One of the natural instincts most commercial growers have is understanding when to boost mineral nutrients to boost plant growth. While that may work for some crops, it is not an effective strategy for hydroponically grown sweet basil. Whether grown at an EC of 0.5 mS/cm or 4.0 mS/cm, there is no discernable effect on plant growth or fresh weight. Basil is efficient with mineral nutrients

and, as a result, providing more nutrients will not increase yields. While increasing fertilizer won't boost growth, be sure to watch for magnesium deficiencies to maintain leaf greenness and marketability.

### Planting density

One of the easiest opportunities to boost yields during the cooler, low-light months is by increasing planting density by reducing the space between plants. By increasing the planting density and producing more plants per unit area, yield over your growing space can increase. For instance, if basil is currently on a 6- or 8-inch center, change to a 3- to 4-inch center. There will be an increase in costs for substrate

and seed because more seedlings will be grown for transplant. However, this should be more than compensated for by the increased yield and subsequent revenue.

### Take-home message

Sweet basil is the most popular culinary herb grown hydroponically. For greenhouse production, the late spring, summer, and early fall can be very productive for basil. However, basil yields in the late fall, winter and early spring can be improved through better management of air temperature, light and plant spacing. **pg**

The author is an extension specialist and professor at Iowa State University. [ccurrey@iastate.edu](mailto:ccurrey@iastate.edu)

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