

# Sunlight and Sustenance

by Mark Mathew Braunstein

We live *on* the Earth, but we live *by* the Sun. The Sun grows our crops, warms our bodies, defines our seasons and measures our days. Sunlight is the gold standard for light quality, but what about its quantity? At the equator, daylight spans 12 hours a day, every day. At Latitude 40 degrees North, an imaginary line that traverses New York City and Salt Lake City and skirts Vatican City, daylight lasts more than 16 hours on June's first day of summer, but barely 10 hours on December's first day of winter. Winter light compared to summer light certainly is shorter, and also is weaker.

As indoor gardeners, we can compensate for winter by extending and fortifying daylight hours with artificial lighting. Artificial light promotes clearly measurable plant growth even when its color temperature varies widely from sunlight. Contrary to most folks' assumptions, seedlings grow just as well when illuminated with standard cool white fluorescent lamps as with full-spectrum grow lights of equal wattage. A fuller spectrum is necessary to spark flowering, to fertilize seeds and to nurture fruits, but not to promote the growth of young seedlings. Examples of seedlings that many of us grow for food include wheatgrass, sunflower greens, pea shoots, and trayfuls of garden vegetables that collectively we now call **microgreens**.

Indoors, all of the above microgreens flourish even behind window panes that filter out most of the ultraviolet spectrum of sunlight. Sunlight is so intense that even indirect sunlight, also called shade, can suffice to nurture certain greens. So do not confuse indirect sunlight with insufficient light. Insufficient light spurs plants only to grow tall, but not strong or vigorous, and does not generate the deep green color that is the visual marker of chlorophyll.

If just one of your windows provides direct sunlight for at least half the daytime, that is enough light



*BOTH batches: Six days since sown.  
LEFT batch was grown four days in all darkness, and then two days in continuous light.  
RIGHT batch was grown two days in all darkness, and then four days of alternating darkness and sunlight (sunlight only, no artificial light).*

for growing most microgreens. So how long is your daytime? For your sunrise and sunset times, consult your daily newspaper, an almanac, weather websites, or just look out the window. For dawn, subtract one-half hour from sunrise. For dusk, add one half-hour to sunset. Next, count the hours from dawn to dusk. For most garden vegetables, 10 hours per day of mostly direct sunlight or 14 hours of mostly indirect sunlight can suffice. While this tally applies to all stages of vegetative growth, it is less crucial for microgreens. Under weak winter sunlight or indirect summer sunlight, microgreens may need more days to grow, but they still will grow.

## Seek the Light!

Exposed to insufficient light, seedlings grow long and frail stems in a vain attempt to reach for more light. Gardeners call this sorry state **leg-giness**. Botanists call it **etiolation**. Avoid cultivating long and frail stems because stems generally are tough or bitter, while leaves tend to be tender and sweeter.

Conduct a taste test. Go to your fridge, and remove from the vegetable bin one large lettuce leaf. For this test, romaine lettuce serves well, butterhead and looseleaf lettuces suffice, but iceberg lettuce not at all. If you wish, wash the leaf. **CONT'D ON P. 44**

**SUNLIGHT AND SUSTENANCE,  
CONT'D FROM P. 26**

Now trim away the flexible outer leaf that generally is a deeper color green, and retain the stiff central spine whose color generally is off white. Now eat only that outer leaf. Tender, succulent, maybe even sweet! Nice! Okay, next eat the remaining central spine. Fibrous, bland, maybe even bitter! Not so nice!

Let's talk sunflower, whose very name is very sunny. Some indoor gardeners find that their sunflower greens grow long and frail stems. To prevent this they extend the initial "darkness" stage by one or two extra days. During the darkness stage (I recommend a duration of 2–3 days), some sort of weight is placed atop a tray which itself rests atop the sunflower greens. Weighed down, the seedlings grow stems that are strong and squat. But the plants are seeking the light of the sun, not extra days of darkness under another tray. The problem is lack of light, not lack of weight. So instead of growing stems that are long and frail and fibrous and bitter, under pressure such un-green sunflower greens grow stems that are short and squat...and fibrous and bitter!

Conduct that same lettuce taste test upon sunflower greens. Take a handful, snip off just the leaves with your fingers or your teeth, and once you

have a handful of leaves eat only those leaves, but not the stems. Tender, succulent, even sweet! Again, nice! Next, eat just those leftover stems. Relatively tough, maybe bland, or maybe even bitter! Again, not so nice! The leaves, not the stems, impart the delicate and agreeable flavor that makes sunflower greens so highly prized. The smaller their leaves, the lesser your prize.

**Get Your Fill of Chlorophyll**

Chlorophyll in leaves converts sunlight energy into plant matter, which mostly are sugars and starches but also all other plant nutrients. Chlorophyll imparts the green in vegetable greens. Deep, dark green in leaves indicates richer chlorophyll content. More chlorophyll signals the plant's potential to produce more sugars and all its other phytonutrients. More sugars and more nutrients result in more flavorful and nourishing veggies. Thus the goal is to grow lush leaves, not long stems. Simply stated: leaves, not stems.

Longer hours or stronger lumens of light foster the growth of larger leaves, shorter hours or weaker lumens foster longer stems. In seeking the light, try to make that more sunlight. From sunrise to sunset, follow the path of sunlight in your home. If you must, move your crop from window to window, even from room to room. Because our sunny dispositions inform us that no light is better than sunlight.

What can possibly be more intense than the sun? Two suns! When sunlight shines through your windows directly upon your microgreens, prop some reflectors to the sides of and behind the microgreens. Merely one reflector in back works wonders. Create reflectors with lightweight white cardboard. (Hint: undersides of produce boxes often are white.) The deluxe model is white foam core board purchased from office or art supply stores. Aluminum foil affixed to cardboard is more reflective than white, but unsightly. The hi-tech version of foil is metalized mylar, a plastic film embedded with aluminum. Some well stocked gardening stores carry metalized mylar, as do sporting goods and camping equipment stores. Camping stores call metalized mylar space blankets or survival blankets.

**In a Dark Time**

Long hours of natural sunlight do reach a natural limit, which is a good thing. Artificial light can artificially exceed that limit, which is a bad thing. More and more light does not necessarily produce more growth or more nutrients. Just as you need at least six hours of sleep, plants need a minimum of six hours of darkness. Yet plants do not rest at night as we do. Instead, after a day creating carbs, during the night plants metabolize and convert those carbohydrates into plant tissue. They deepen their roots, thicken their stems, and broaden their leaves. In essence, plants work hard by day, and grow strong by night.

In an effort to maximize yields, some indoor gardeners shine their artificial lighting 24 hours a day for the last two or three days before harvest. With uninterrupted light and no darkness, seedlings continually create their starches and sugars, but only minimally metabolize them. Imagine stuffing yourself with foodstuff all day long and all night long, but never exercising and never sleeping. Yet you

still will grow. You will grow fat! Such obesity is a measure of quantity, not of quality. Plants exposed to round the clock light become stressed. If for only two or three days, they may not yet visibly manifest their stressed state, but they are stressed nonetheless.

Microgreens and mature greens grown under light round the clock cannot provide us with the same level of nutrients as those whose schedule more closely resembles that of nature. If you are inquisitive, grow one batch of sunflower greens under perpetual light and another under light alternating with darkness.

Their tastes will be so distinct that even the most jaded of taste buds will discern the difference (see sidebar for details). But why bother? We already



**Sunrise/Sunset**

Want to know today's times for sunrise and sunset? [www.TimeandDate.com](http://www.TimeandDate.com) has it all, including a Sun Calculator to create charts for your locality ([www.TimeandDate.com/worldclock/sunrise.html](http://www.TimeandDate.com/worldclock/sunrise.html))

know that nature knows best, and therefore should have faith that nature grows best. So provide your home-grown greens with the light of day, but also with the darkness of night.

**Sundays**

Of everything we eat, green leaves contain the greatest concentration of sun energy. One way to see the light might be to eat it, in which case spirituality just might boil down to a ques-

tion of energy. Nations go to war over land and people become gluttonous or ravenous for the food that grows upon it, but the sunlight which creates that food seldom is in short supply. Sunlight shines upon us all. It is no coincidence that Christianity's day of worship and the Western world's day of leisure both fall on the day named for the Sun. May all our Sundays be sunny and may all our days be Sundays! ☀

[www.MarkBraunstein.Org](http://www.MarkBraunstein.Org)