



Evaluating green coffee beans is essential to ensuring that the final coffee product will be of the highest quality.

Image Source: Pexels user nousnou iwasaki

Coffee roasting is an intricate art that uses heat to coax specific aromas and flavors out of raw coffee beans, transforming them into the beloved beverage many of us depend on to start the day. Home roasting aficionados, artisanal small-batch roasters, and mass roasters alike continuously seek to perfect their roasting processes by experimenting with process variables to satisfy the palettes of today's sophisticated and gustatorily educated coffee drinkers. Once the roasting process is over, debate rages about how to get the most out of the finished beans: *Do I need a burr grinder? Is drip coffee ever okay? Is pour over better than a Chemex?* As demand for and knowledge about "good" coffee has spread, the discourse surrounding what makes coffee good has become louder, more multifaceted, and complex than ever before.

But before roasting temperature, grinder type, and brewing methods enter the picture, everyone agrees that good coffee starts with good coffee beans. Without high-quality green coffee beans, the best roasting, grinding, and brewing practices in the world will still yield a less than optimal result. As such, coffee roasters must take great care to select beans that meet their criteria using specific quality parameters. However, there is currently no universal standard for grading and classifying green coffee. Instead, "each producing country has developed its own classification and grade charts, which are often also used to set minimum standards for exports."¹ These grading and classification systems exist primarily to "produce homogenous commercial lots," rather than truly indicating an excellent product. In response, the Specialty Coffee Association of America (SCAA) has created its own Green Coffee Grading Protocols to facilitate identifying and grading specialty coffee products.²

Despite the lack of uniformity of grading, color is regarded as a prime indicator of coffee quality within all classification systems and is of particular importance to those who wish to go beyond minimum export standards and toward a higher level of product. The spectrophotometric color

evaluation of green coffee beans allows coffee roasters to select only the best beans, enhancing both quality and consistency.



The color of green coffee beans tells a story about the history of the bean thus far and helps you predict the possibilities for the future.

Image Source: Flickr user Aidan

The Meaning of Color

The color of green coffee beans can be affected by a number of factors during cultivation, picking, drying, and milling and gives important clues about the characteristics a particular bean will take on during roasting and brewing. Acceptable beans fall into one of the following color categories:

- Grayish-blue
- Grayish-green
- Brownish-gray-green
- Brownish-green
- Brown

Grayish-blue and grayish-green coffee beans are considered to be the most desirable, gaining their distinctive hue from gradually drying in the sun after washing while air evenly circulates around the beans. This gradual drying process results in a coffee that roasts well and gives a “well-balanced acidity, full body, and a rich coffee flavor free from any aftertaste.” On the other hand, a more rapid drying process will create “a parchment that splits open in the final drying” and may “have characteristics of light acidity to somewhat lacking acidity, light body, and a flat flavor in the cup.”

Green coffee beans with brownish tones are considered of inferior quality, as the hue indicates they may have been scorched during drying or picked while under or over-ripe. As a result, the beans produce “a very light acidity, light body, and, normally, overly dominant flavors,” making them [more suitable for very dark roasts](#) which can disguise their gustatory imperfections. Beans

that fall outside of this spectrum—including faded, amber, green, and foxy beans—are generally regarded as inappropriate for further processing, as their undesirable color may indicate serious quality defects such as severe over-ripeness, over-fermentation, disease, insect damage, water damage, or growth in mineral-starved soil.



Spectrophotometric evaluation of green coffee beans can replace the subjective and labor-intensive manual sorting process to enhance quality and consistency.

Image Source: Unsplash user Daniel Ruswick

Spectrophotometric Color Evaluation of Green Coffee Beans

With a lack of universal grading standards, specialty coffee roasters often perform their own quality assessments on green coffee beans to ensure that only the best beans are chosen for roasting. As the Chicago Coffee Roastery says:

To find the best beans, we evaluate [...] bean color, uniformity of size and color, [and] occurrence of any defects. The greater the number of defects found in a random sample of a lot of coffee, the lower the grade that lot is assigned. Higher quality coffee is more carefully sorted to remove all of the defects. This additional sorting takes more time, and as we all know, time is money, which is why higher grade coffee costs more.

Manual inspection of green coffee bean color is indeed time-consuming and laborious.

Spectrophotometers offer a rapid, simple, and non-destructive method of color assessment that removes the need for labor-intensive sorting as well as [the imprecision inherent to visual inspection](#). Today's sophisticated spectrophotometric instruments are able to quickly measure the color of green coffee beans with extraordinary accuracy to [facilitate more precise sorting and enhance consistency](#). With [integrated height measurement capabilities](#), these tools can account for texture variation to produce precise quantification of chromatic information and alert operators to colors that fall outside of [your chosen tolerance level](#), allowing you to immediately quarantine defective beans. As such, you can be assured that only the beans that meet your personal criteria are chosen for further processing and achieve the highest level of batch-to-batch consistency,

ultimately augmenting the coherency of your roasting practices and fortifying your reputation for quality.

HunterLab Color Measurement

HunterLab has been a leader in the field of color measurement for over 60 years and has developed a reputation for technological excellence, innovation, and responsiveness to customer needs. Our renowned [ColorFlex EZ Coffee spectrophotometer](#) is widely used throughout the coffee industry to measure and classify the color of roasted coffee grounds. However, our versatile range of color measurement instruments also allows you to begin creating the highest quality coffee long before the roasting process; by spectrophotometrically evaluating green coffee beans, you can easily optimize sorting accuracy to ensure that your product is the best it can be. [Contact us](#) for more information about our innovative lineup of color measurement instruments, customizable software packages, and world-class customer service supports and let us help you select the right tools for your needs.

1. "Grading and Classification of Green Coffee," http://www.ico.org/projects/Good-Hygiene-Practices/cnt/cnt_en/sec_3/docs_3.3/Grading%20&%20class.pdf
2. "Green Coffee Grading Protocols," November 21, 2009, <http://www.scaa.org/?page=resources&d=green-coffee-protocols>