# a FOCUS on FLAWS

## DO YOU USE THE SCAA'S GREEN ARABICA COFFEE CLASSIFICATION SYSTEM?



By Beth Ann Caspersen Photos courtesy of Equal Exchange

The term "specialty coffee" has grown and changed over the past several decades. Today, when a buyer considers the options for purchasing coffee, he or she probably takes a variety of things into account: quality, cost, social and/or environmental impact, and more. As a specialty coffee professional, what is your definition?

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Farmers in Uganda learn about the importance of harvesting ripe cherries.

The Specialty Coffee Association of America (SCAA) has created standards for a number of activities over the years—including the Green Arabica Coffee Classification System (GACCS) discussed in this article—all aimed at producing a quality product. Today, the SCAA defines specialty coffee based on whether specific physical and sensorial attributes—in other words, how the coffee looks and tastes—meet clearly defined standards.

The physical attributes include size, weight, number of defects and moisture content of green coffee, and the number of quakers (immature beans that do not darken when roasted) in a roasted sample. The sensory evaluation scores roasted coffee in 10 categories encompassing all aspects of flavor, from acidity to cleanliness; a coffee must achieve a score of 80 points or higher to be considered specialty. To eliminate any variables other than the coffee itself, the SCAA has established protocols for evaluating the sensory attributes of roasted coffee (cupping protocols).

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Beth Ann Caspersen of Equal Exchange (right) and the quality team from the Gumutindo co-op in Uganda introduce farmers to the SCAA green coffee defect system.





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Clearly, the system is designed to consider both defects and cup quality. After all, the two go hand in hand—or do they? Does your decision to buy a coffee take defects into account, or is the emphasis solely on cup score?

### GREEN COFFEE STANDARDS

There are dozens of green coffee grading systems around the world. Most countries that produce coffee have their own internal systems to evaluate their exportable crop, and many are detailed and provide clear guidance to evaluate the physical attributes of green coffee (size, defects, moisture) and the flavor of roasted coffee, as well as altitude and regional characteristics. They use terms like *fancy, extra*, *AA*, *SHG* (strictly high grown) and *SHB* (strictly hard bean), among others, to describe levels of quality. Each country is different, but all appear to have a shared goal of grading quality. With so many green grading systems available, why did the SCAA create its own?

In 1998, I began learning about different types of defects and their causes from my first mentor in the industry, George Howell, one of the pioneers of specialty coffee in the United States. We looked at pulper damage, blacks, triangles, insect damage and the elusive foxy. We didn't have a list or chart to reference, but Howell shared his knowledge about where the defects might have come from and what they were called.

At the time, while many green coffee standards existed, they were geared toward commercial grades. Specialty coffee was gaining traction, but it did not have a clear set of standards that differentiated it from commodity grade. Without a system, how could you identify great coffee? Clearly, there were cuppers and buyers who already knew the difference, but the SCAA worked to develop a definition and provide a clear way forward, to create a common vocabulary and define the parameters for extraordinary coffee.

In the 1990s, the SCAA introduced the first Coffee Tasters' Flavor Wheel, and we saw the development of the cupping form and a green grading system—one that would evaluate the physical characteristics of green coffee and set standards for specialty grade. It appears there were a variety of influences, including



Women sort coffee for defects on raised drying beds in Uganda



Mart M

Raised beds for coffee drying in Uganda.

organizations in producing countries, like the Brazilian and Colombian coffee federations, and the "C" contract.

According to Ted Lingle, executive director of the SCAA at the time the standards were developed and a key architect in the process, the GACCS was created in 2001 as a follow-up to the SCAA cupping protocol and form. From there, green defects were displayed on a poster with defect names and pictures.

In 2001, when I became coffee quality manager at Equal Exchange, I implemented a rigorous set of standards for the coffee we were importing. At the time, it was common to describe European Preparation (EP) in coffee contracts (and still is, in many cases). I discovered that EP meant clean coffee, but lacked a detailed definition. The GACCS had just been published in poster form, so I began with that. It was a good way to start conversations in our supply chain, but I wanted more definition to fully adopt the SCAA standards as our own.

Fortunately, in 2004, the SCAA Technical Standards Committee published a booklet to accompany the defect poster. It was a welcome and necessary addendum to the poster. The booklet provided a tool to support the SCAA and the Coffee Quality Institute (CQI) in developing what would become the Q Grader program.

### USING THE GACCS

The GACCS is a detailed approach to identifying and grading green coffee, often referred to as the physical analysis of coffee. A 350-gram sample of green coffee is put through a series of tests to analyze the moisture content, bean size and imperfections, which are categorized into two groups: category 1 and category 2 defects. One full category 1 defect typically eliminates a sample from receiving specialty status. A cumulative score of five full category 2 defects does the same. (See chart on pg. 40 for more details.)

The defect assignment is based on appearance and categorized according to how the defect affects flavor. Once the coffee is roasted, there is an additional step to count the number of

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quakers. This system is detailed in the SCAA *Defect Handbook*, with a shortened version available in colorful poster form. The poster includes pictures and descriptions for each defect, as well as the possible cause, remedy and effect on the cup.

Despite the pictures and definitions, a lot of education still was needed. We were speaking a different dialect within the language of coffee that was not just

theoretical. it was intended to be *the* standard for specialty coffee. Over the years, I have spent hours learning to use this clear tool and teaching it to everyone in our supply chain, including wet and dry mill managers, farmers, cuppers, export managers-anyone who touches the coffee.

Then something changed for me. At a specialty coffee seminar a few years ago, I heard one of my colleagues describe the

GACCS as an "ideal," implying that it wasn't being used as a regular unit of measure for quality. I'm fairly certain my jaw dropped to the floor. Shouldn't a standard be a firm set of rules that guides business decisions? In order to build and maintain a common vocabulary, shouldn't we as importers and roasters be holistic in our approach to analysis? In theory, the defect count affects the cup flavor—or does it?

## THE CREATION OF THE GACCS

There's a lot of overlap throughout the world of green coffee grading systems, with different equivalency tables and defects that are country-specific. The SCAA set out to develop a universal system, one that could work for many countries while differentiating specialty coffee from commercial grades. So how did the association choose the specific defects included in its system?

"The idea was to identify the most common defects that occur during processing," says Steven Diaz, commercial and quality director for Expocafe—an exporter for coffee grower cooperatives in Colombiaand a member of the SCAA Technical Standards Committee at the time the standards were developed.

"From a scientific perspective," adds Joseph Rivera, a coffee scientist with coffeechemistry.com and the SCAA coffee science manager at the time the system was developed, "those defects that are currently considered category 1 defects are typically those with objectionable compounds—dimethyl sulfide, butyric acid, acetic acid, etc.—and extremely low sensory thresholds."

Insect damage can be particularly mysterious. The GACCS divides it into two classifications: severe and slight. Severe insect damage is defined as three or more perforations in a single bean. Five beans with severe insect damage in one sample equals one full category 1 defect. If a bean has fewer than three perforations, it is considered to have slight insect damage. Ten beans with

slight insect damage equals one full category 2 defect.

Why are insect-damaged beans divided into two categories? Aside from their appearance, what is it about severe-insect-damaged beans that places them as a category 1 defect while many other systems place them in category 2?

"Severe-insect-damaged beans carry adults, larvae and, most likely, mold development within the bean that affect cup quality," Diaz says. "Slight-insectdamaged beans are usually in the initial stages of attack."

## FLAVOR BLAME

If a coffee tastes bad, shouldn't there be a green defect that correlates to that flavor?

The vast majority of defects can have more than one cause, and to make matters more complex, many defects can produce multiple defective flavors in the cup. For example, a full-black coffee bean (a category 1 defect) could produce any of the following defective flavors in the cup: ferment, stinker, dirty, moldy, sour or phenolic. However, an insect-damaged bean also could produce dirty, sour, moldy or rioy flavors. How do we know these defects produce these flavors? Is there science to support our assertions?

Most of the flavor descriptors for these defects are based on deep and entrenched knowledge within the coffee industry. Coffee tasting in some form has existed for more than 100 years. Becoming a coffee taster historically involved an apprenticeship, with detailed information passed from one generation to the next. The descriptions for defective flavors are based on this information, along with the experiences of the SCAA Technical Standards Committee members at the time the standards were developed.

There appears to be some science that correlates the physical defects with the flavor descriptions in the GACCS: however, it's relatively limited and difficult to access. Many coffee professionals have done their own

testing—spiking cups and roasting specific Interestingly, one cannot assume that

defects to observe the taste attributes. Experiments in my own lab over the past 10 years have yielded inconclusive results. because you taste a defect in the cup, it will correlate to a defective bean. For example, I have cupped samples with phenolic flavors from green samples that were perfectly clean—no trace of black, fungus or hulls



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as the system might suggest. It's clear we still have a lot to learn and share about the correlation between green coffee defects and their impacts on cup quality, but this in itself provides a strong argument for counting defects and scoring sensory attributes of every coffee one is evaluating.

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#### A FOCUS ON FLAWS (CONTINUED)



Overripe cherries on a coffee tree.

## WHO USES THE GACCS?

I have long believed in the power of a common vocabulary, so it made sense to me to adopt the GACCS, but I wondered if others use it consistently for contracts or purchasing decisions.

"When both the seller and buyer agree to a green coffee classification system, as well as the allowable defects for a green coffee contract, both sides of the transaction are fully aware of the quantitative measurement to define quality," says Spencer Turer, chair of the SCAA Technical Standards Committee and vice president at Coffee Analysts in Burlington, Vermont. "The system, or any system that is agreed to, removes any guessing and misunderstanding for the acceptable quality to execute a green coffee contract. Without a measurable standard or classification schedule, quality rating would be vague and ambiguous, quality could not be controlled, and consistency to the consumer would be impacted."

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A sample of coffee drying on raised beds in Uganda.



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#### A FOCUS ON FLAWS (CONTINUED)



Washing station managers in Uganda attend a green coffee sorting workshop presented by Equal Exchange in 2012.

At Equal Exchange, as an importer and roaster, we include "SCAA preparation" in our green contracts, which includes the physical and sensorial evaluations. We analyze both pre-shipment and arrival samples based on the GACCS and write detailed reports about our findings. Our goal is to be transparent and fair with our analysis, and to hold our suppliers accountable.

For years, I have thought this is what specialty coffee professionals are supposed to do—if it's considered specialty, it should adhere to these standards—but time and again I hear colleagues emphasize cup quality, sometimes without even analyzing green coffee defects. After numerous conversations with our suppliers about a holistic approach to specialty coffee quality, meaning both physical and sensorial, I wondered if my experience reflected the reality in the market. I was astounded by what I learned.

While I did not do a widespread industry survey, I did speak with about a dozen industry professionals, including exporters, importers and roasters. None of these professionals includes SCAA specifications in green coffee contracts, though all say they include quality scores, sometimes noted as SCAA points.

One importer told me, "Nobody grades specialty coffee (in the U.S.)."

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Caspersen works with farmers at a washing station in Uganda.



## Harvests aren't the only things bearing fruit over the last 20 years



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Washing station managers get hands-on experience sorting green coffee at a 2012 workshop at Nasufwa primary society in Uganda.

I was baffled to learn that specialty quality for many people is one-sided, focusing only on cup quality. A few told me defects aren't a problem in their purchases because they buy such highgrade coffees, but they also admitted they never grade their coffee.

The standards are in place to provide clear guidance based on data and evaluation. Sorting coffee to specialty standard costs more—how much more depends on the quality of the cherry or parchment that arrives at the buying station. If the coffee is especially clean before it is put through the dry mill process, the cost may be minimal. Several professionals who sort based on the GACCS estimate it can cost from 5 to 30 cents more per pound to do so. If given the choice, are you willing to pay for it?

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**Full Sour** 











## SOME COMMON DEFECTS



Full Black



Partial Black

Fungus



A density sorting machine in Colombia.

Clean green coffee (right) compared with defects removed by a green coffee sorting machine.

### WHAT'S NEXT?

A lot has happened since the GACCS was established, and some wonder if the system needs to be updated. How will climate change affect the level and intensity of defects? Is this system truly universal for washed arabicas?

Diaz hopes for an expanded version of the defect booklet, "with more description of the defects and their variations," he says, and "more technical and detailed information of the causes and occurrences during processing."

Rivera would like to see a system developed for alternatively processed coffees, such as naturals, pulped naturals, semi-washed, doublefermented and others.

But as Turer notes, "Any changes to the SCAA quality classification system for cup or grade will impact the determination of specialty quality and Q certification, and will financially impact the stakeholders of the green coffee supply chain. Changes of this magnitude are very serious, and are not being considered by the Technical Standards Committee." While I would like to see the system updated to reflect the science currently available, first I would encourage industry professionals to use the existing system consistently.

If you don't use it, why not?



BETH ANN CASPERSEN is coffee quality control manager at the Equal Exchange Cooperative in West Bridgewater, Massachusetts. Equal Exchange is a specialty food cooperative that sources coffee, chocolate, tea and other products from small farmer cooperatives all over the world. She is a specialized instructor for the SCAA, a member of the Coffee Tasters Pathway Committee, a Q instructor, cofounder of Java Jog for a Cause and an advocate for women's rights. Contact her at bacaspersen@ equalexchange.coop.

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Caspersen sorts green coffee and discusses defects with women at the Gumutindo co-op in



## AN OVERVIEW OF DEFECTS in the GACCS

The SCAA Green Arabica Coffee Classification System divides defects into two categories. Category 1 defects are the most severe; one bean showing any of these defects (except in the case of severe insect damage, where five damaged beans are required) excludes a sample from achieving specialty status. Category 2 defects are less severe; these are counted and given a cumulative score, with a sample showing the equivalent of five full defects or more being excluded from specialty status. If a bean has more than one defect, such as the bean shown in the photo to the right (partial sour and slight insect damage), the sorter can count only one, so he or she counts the defect with the most adverse effect on flavor (in this case, partial sour).



The following brief explanation of common defects has been compiled from information in the SCAA Defect Handbook. Find the official handbook at *scaa.org*. See pg. 37 for photos of some common defects.

## CATEGORY 1 DEFECTS

DEFECT NAME	# OF BEANS EQUAL TO 1 FULL DEFECT	DESCRIPTION
Full Black	1	Opaque in color.
Full Sour	1	Yellowish or yellowish-brown to reddish-brown in color. The embryo inside the bean (see photo, pg. 37) typically is dark or black. If the bean is cut or scratched, a sour or vinegar-like smell is released.
Dried Cherry/Pod	1	The dried pulp usually covers part or all of the parchment, sometimes with the presence of white spots or powdery residue.
Fungus Damaged	1	Yellow to reddish-brown powdery spots (spores), which can cover part or all of the bean.
Foreign Matter	1	All non-coffee items such as sticks, stones, nails, etc.
Severe Insect Damage	5	Broca beans, as they are commonly called, are distinguished by small (0.3 to 1.5 millimeters in diameter), dark holes, often on opposite sides of the bean. Three or more perforations = severe damage; five or more severe damaged beans = one full category 1 defect.

## CATEGORY 2 DEFECTS

DEFECT NAME	# OF BEANS EQUAL TO 1 FULL DEFECT	DESCRIPTION
Partial Black	3	Less than half of the bean is opaque.
Partial Sour	3	Less than half of the bean appears sour. (See "Full Sour" under category 1 for description.)
Parchment/ Pergamino	5	Partially or fully enclosed in a thick, papery, white or tan husk.
Floater	5	Distinctively white and faded, giving the sample a mottled appearance. Will float when placed in water.
Immature/Unripe	5	Pallid, yellow-greenish color of the silver skin. The silver skin is tightly attached to the bean. Often smaller than normal beans, curved inward in a concave shape with sharp edges.
Slight Insect Damage	10	See description under category 1, above. Fewer than three perforations = slight damage; 10 or more slight damaged beans = one full category 2 defect.
Shell	5	Malformed beans consisting of an inner or outer part. One or both may be found; in some cases they will still be together. The outer section has a seashell shape. The inner section can be conical or cylindrical.
Broken/Chipped/Cut	5	Usually dark reddish in color due to the oxidation of the area where the cut/chip took place during pulping.
Hull/Husk	5	Shows fragments of dried pulp with a dark red color.
Withered	5	Usually smaller than normal beans and malformed, with wrinkles that resemble those of a raisin.

# Cameron Heath, Award Winning Roaster of Revelator Coffee, Profiles with Giesen

