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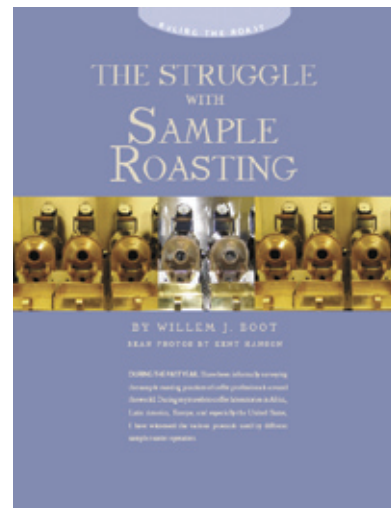
RULING THE ROAST

The Struggle with Sample Roasting

by Willem Boot
photos by Kent Hanson

DURING THE PAST YEAR, I have been informally surveying the sample roasting practices of coffee professionals around the world. During my travels to coffee laboratories in Africa, Latin America, Europe, and especially the United States, I have witnessed the various protocols used by different sample roaster operators.

From this, I must conclude that many professionals in the coffee industry struggle with their sample roasting techniques. At the offices of coffee importers in North America, coffee roasting degrees are often too dark. This makes it virtually impossible to detect coffee taints or defects and, at least as important, dark roasting colors generally mask the natural flavors of the coffee, which prohibits the coffee taster from evaluating the true flavors of the beans. Additionally, I have noticed that throughout the industry, coffee professionals do a poor job in terms of roast consistency; rarely do I see sample roaster operators utilize a master sample to assure that roast colors of samples are consistent. Few professionals use adequate lighting, like incandescent full-spectrum bulbs, to ensure an objective inspection of roast colors. I have also seen unacceptable conditions at the offices of coffee producers and exporters who don't make the effort to synchronize their roasting and cupping



protocols with those utilized by their clients.

Sample roasts are more important in the quality inspection protocol than many roasters realize. Often, the sample itself can represent a large quantity of coffee, sometimes as much as an entire container, which is about 37,500 pounds of green coffee beans. That's a lot of coffee to make a decision about, especially if you're basing that decision on a poorly roasted sample.

Roasting samples is at least as challenging as operating larger industrial roasting machines. Generally, sample roasting machines are not equipped with automatic time-temperature profilers. This puts a higher emphasis on the skills of the operator, who has to assure that roast colors are consistent and that roasting times are within a consistent range.

Let's review some of the important factors that can influence the outcome of the sample roasting process.

Equipment

Most sample roasters generally resemble the larger industrial roasting machines. Capacities range from four ounces to one pound per batch. The heating is normally

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done with gas-fired atmospheric nozzles or with electric heating elements.

Many companies in the U.S. still use “good old” Burns sample roasters, which are the dinosaurs of roasters and preferred by many for their simplicity and durability. The Burns machines have a perforated drum and operate with ample airflow, but normally they lack the option to incrementally adjust the flame or airflow level, which can make these machines somewhat difficult to use.

As a result, many inexperienced operators tend to set the flame levels too high. This causes the beans to build up a high volume of heat, which becomes exothermic when the first crack occurs, resulting in a roast process that accelerates too fast. This leaves hardly any time for the beans to develop the true coffee flavors.

Other companies use the more modern

Probat sample roasters, which have a solid drum and utilize a high volume of airflow. Most operators of Probat sample roasters use the air damper to increase or decrease the air and heat volume in the drum. This allows the operator to gradually control the drum temperature. While the solid drum of the Probat generally guarantees a more even coffee bean development, these machines can be difficult to use as few operators understand the real function of the air damper and therefore often use roast times that are too fast.

The Keys to Sample Roasting

There are three keys to assuring the perfect sample roasting process: roast degree, consistency and time.

ROAST DEGREE

During a visit to the laboratory of a well-known specialty coffee importer, I observed their roasting degree, which was around Agtron 50, right at the start of the second crack. Despite the fact that many roasting companies use degrees of roast well beyond this point, I feel that samples roasting should be done at a much lighter degree. At a lighter degree of roast, the coffee will reveal its true flavors, and the beans have developed a minimum of caramelized flavors, which generally occur as a result of the roasting process.

Pictures A. (this page) and B. (next page) illustrate a desired roast color for high-grown Central American coffees.

continued on next page



Picture A.
*Desired roast color
for high-grown
Central American coffee*

Instead of roasting the beans to a dark brown color with a smooth and even surface, these lighter-roasted beans are not fully expanded and still show wrinkles. At this point in the roasting process, the transformation of sugars—the caramelization—has just begun and the coffee will still taste as it was meant by Mother Nature, without the sweet aftertaste, which is generally a trait of darker roasted beans.

Besides the aspect of roasting light enough to taste true coffee flavor, there is the issue of being able to taste defects. Roasting samples to a degree of Agtron 558 (beans) or even lighter makes the detection of defects much easier. How comfortable do you feel with an importer who roasts all samples too dark, which inevitably masks taints like fruity, moldy and dirty?

CONSISTENCY

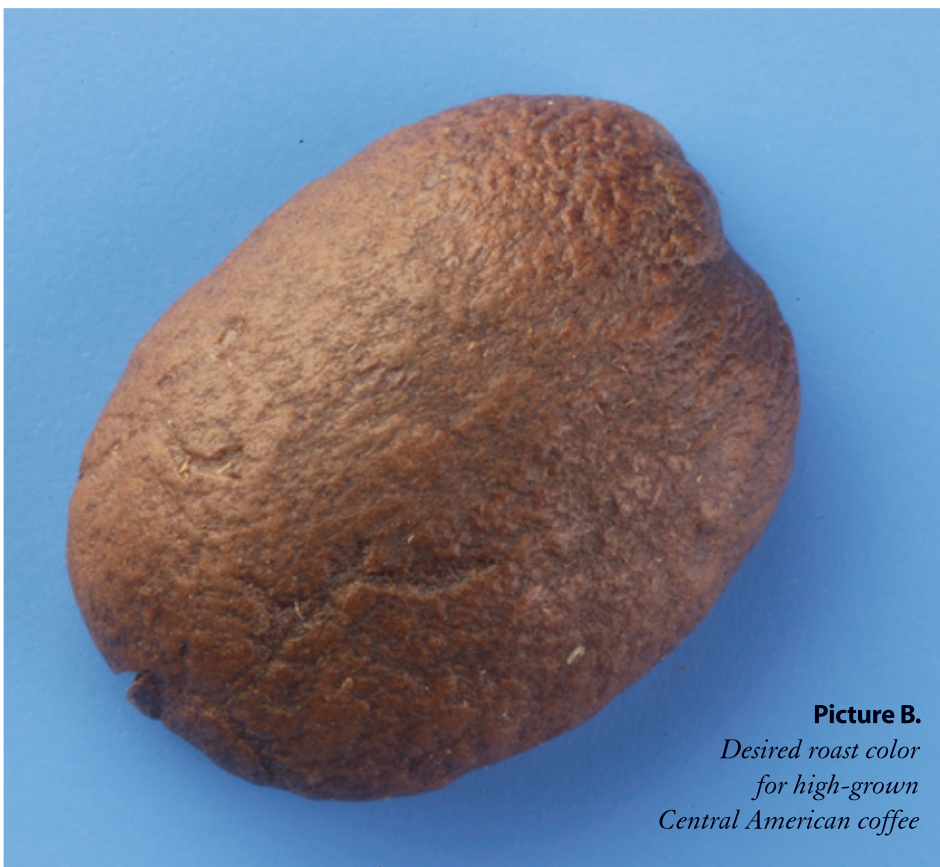
A second observation I made while surveying sample roasting practices around the world is the lack of roasting consistency. At the highest podium of specialty coffee, during the recent SCAA show in Atlanta, I was surprised by the roast inconsistency of samples that were presented at the cupping pavilion. The lightest sample had a color of Agtron #62 and the darkest sample was at least 20 points darker!

The cupping session that followed proved how big the impact of roasting can be on the flavor of coffee. The lightest samples had distinct citric flavor notes, while the darkest samples tasted sweet with a berry-like aftertaste. Unfortunately, the cupping session was inconclusive because the cuppers could not sense at all if the differences in flavor were the result of the coffee or of the sample roasting protocol. This illustrates the importance of roasting consistently in color and in time-temperature profiles.

So, what are some of the important factors that facilitate a consistent sample roasting protocol? First, turn on the light! Install one or more 100–150-watt full-spectrum incandescent lights above the sample roaster with a clearance of about two feet above the sample roaster. Full-spectrum lights give the operator nearly perfect conditions for inspecting the color of the coffee beans during and after the roasting process.

Second, make sure that your sample roaster is equipped with the right hardware. The sample roaster should have a reliable probe that measures drum temperatures.

Furthermore, it is extremely helpful to utilize a gas pressure meter that displays every adjustment in gas flow to the burners, so



Picture B.
*Desired roast color
for high-grown
Central American coffee*

Assuring The Perfect Roasting Process

ROAST DEGREE

Utilize a master sample with a color of Agtron 55–62 (beans). Store the master sample in a cool environment and refresh it every month.

CONSISTENCY

To obtain the best consistency, compare each roast against the master sample during roasting. Utilize full-spectrum incandescent light bulbs.

TIME

Set a standard for sample roasting times. Roast all samples in a consistent number of minutes. Roast times should not be faster than eight minutes and not slower than 15 minutes.

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that the operator at any time can monitor the indicative BTU-output of the burners. This device provides the operator with an accurate indication of what the heat supply level is to the roaster.

Additionally, the sample roaster should be able to cool the samples quickly. Unfortunately, most older sample roasters do not cool the beans fast enough, which can reduce the acidity of the coffee in the cup.

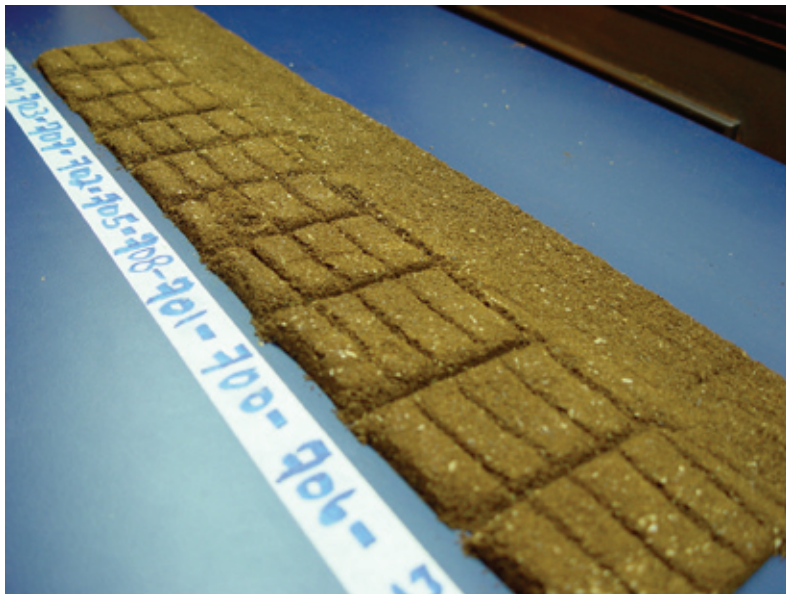
TIME

A third important factor in sample roasting is time. I have observed many roast masters roasting their samples too fast, which can change the flavor profile of the coffee dramatically. Try roasting a SHB Central American sample, first for five minutes and then for 10 minutes to the same degree. The samples will taste very different.

Overall, I recommend roasting samples for cupping in consistent time-temperature profiles. Ideally, roasting times should never be faster than eight minutes.

During the Cup of Excellence competition in Honduras, a team of two roast masters was responsible for sample roasting. Each sample was compared against a master sample during roasting and checked again on a specially designed inspection table. If roast colors were too light or too dark, then the sample would be roasted again.

As shown in picture B, the outcome of this stringent protocol was an almost perfect consistency in roast color. As a result, the panel of tasting judges could concentrate fully on the flavors of all



presented coffees, which is exactly what an optimal sample roasting protocol is all about.



WILLEM BOOT is president of Boot Coffee Consulting & Training in Mill Valley, Calif., specializing in cupping and roasting courses and strategic consulting for the coffee industry. Willem can be reached at willembot@bootcoffee.com or at 415.380.1999.