Coffee Roaster Seasoning

UNRAVELING THE MYSTERY

by Eric Faust

photos by kristen warrenfells
at black sheep coffee cafe

SEASONING A COFFEE roaster is one of the living legends of roasting; many use it as the foundation of their craft and others see as an urban myth. The concept makes us ask a number of questions, including: what is the purpose of seasoning a roaster? Where did this idea originate? And how do you properly season a roaster?

continued on page 22

As children we knew of kitchen pans that were never washed with soap, but always cooked food to perfection. Our elders often spoke about the patina, as if the pan would be unusable without it. Many of us can still imagine the smell of burning fat filling the air during the seasoning of a new pan. We remember the stern lecture we received the first time we dipped a pan in the soapy water—and we never let it happen again. These pans have made us ask, how does the food cook to perfection? Is it the person who is cooking or is it the pan they are using?

Award-winning coffees and accomplished roast masters have raised the same questions that were first asked in the kitchen: is it the person working the roaster or is it the roaster that the person is using that makes the perfect roast? It is a debate that has been a part of roasting for as long as people have roasted coffee. To some, the roaster is the source of their craft, but to others

the roaster is simply a vehicle for their skill as an accomplished roaster. This debate may never cease, but much can be learned from unraveling the mystery of seasoning a coffee roaster.

Season to Taste

Not surprisingly, the taste of the coffee is the impetus for seasoning coffee roasters. Coffee professionals who season their roasters believe that coffee roasted in direct contact with the metal of a drum is imbued with a metallic taste. Many believe that seasoning the coffee roaster creates a build up of oils on the inside of a drum and in the pores of the metal, helping to avoid any direct contact between the metal and the coffee beans.

Seasoning a coffee roaster is similar to that of the pans we mentioned earlier: it's a process of heating and cooling the metal so the pores of the metal fully open, allowing the oil of the coffee beans to permeate the metal. The

continued on page 24

pores of metal can be opened in a variety of ways, but doing it while releasing oil from coffee beans requires control over the heating of the metal as well as the bean. This is a skill that calls for an understanding of metal as well as coffee.

Seasoning coffee roasters can take many different forms. Most roaster manufacturers recommend roasting a few batches of coffee prior to production roasting. The basis for their recommendation is to ensure that particles left over from the manufacturing are removed. In addition, some drums come from overseas, and the manufacturing company will often coat the inside of the drums with a biodegradable oil to protect them from becoming rusty in sea freight. According to Probat, one such company, this oil is designed to burn off in the initial heating of a drum. Probat recommends using a lower-grade coffee, which will not be served, in the initial heating and cleaning of the drum.

However, roasting of a few batches of coffee to clean the roaster does not mean that the roaster has been fully seasoned.

How to Season a Drum

The seasoning of a roaster can be done through the use of a technique or it can occur naturally over time. There are many coffee professionals using machines that have aged and acquired a build up of carbon and oil over many years. This build-up can yield positive results for the coffee, but can also be used as an excuse for a dirty roaster, and should not be viewed as a protective layer or seasoning.

In fact, the build-up of oils over many years of roasting can also have negative effects on the roast. If the drum is not cleaned, the oils and carbon will collect on top of old layers, creating an inconsistent roasting surface on the inside of the drum and a potential place for beans to get caught, causing burnt beans and a potential roaster fire. In addition, layers of old ash and carbon can break off and mix with the roasted coffee, creating a charred and burnt taste when brewed. Thus, roaster should be cleaned prior to seasoning it to insure that there is an even and consistent layer of build-up on the inside of the drum.

In order to properly open the pores of the metal, the roaster must be heated and cooled so that the metal expands and contracts properly. Metal must rise and fall in temperature in order to slowly open the pores of the metal to their full capacity. The cracks of the coffee beans can be used as a benchmark for this expansion and contraction. The metal needs to slowly expand and contract, ideally by bringing the roaster up to the first crack and then letting the temperature drop to a stable level, then bringing the coffee up and past the second crack to allow the coffee to secrete oils while the pores of the metal are completely open. Allowing the coffee to tumble at this stage for an extended period of time will ensure that a layer of

oil and sometimes carbon are built up on the inside of the drum. This process of seasoning will imbed the pores of the metal with oil.

This technique, like the technique of roasting different types of beans, will vary based on the size of the roaster and the type of metal that the drum is made out of. Each roaster will react differently to high temperatures and the residual oils from coffee beans. The only way to know if the drum has been properly seasoned is to taste the coffee.

Each and every roaster manufacturer has a different way of informing their customers about the importance of seasoning their roasters. Diedrich Manufacturing, Inc., says, "the drum should be seasoned to get it impregnated with the coffee oil." They recommend using an inexpensive bean and performing five to ten seasoning roasts, depending on the drum. They recommend using enough coffee to fully cover the lower surfaces of the drum. This will ensure an even and consistent seasoning of the surface. Seasoning is a great way to avoid contaminating the beans with a metallic taste. There are a variety of philosophies and disputes over metal contamination during the roast process.

There are icons in the industry who have used seasoning for a number of years to improve the quality of coffee. Marty Curtis from Combustion Systems works with many antique roasters that are made from a variety of metals, and has created his own method to season a coffee roaster in order to acquire ideal results. Curtis, like many other coffee professionals, uses the metal of a roaster like cast iron skillet, and agrees that roasters, "need to impregnate the metal with coffee oils."

Paul Thornton from Coffee Bean International (CBI) in Portland, OR, has roasted coffee since 1982. In more than 20 years, Thornton has had the opportunity to season a number of roasters, including three in the past year. He believes that it is necessary to season a drum because when metal is heated it releases an aroma during the roasting process that the beans will absorb, resulting causing a metallic taste. In the proper seasoning of a drum, Thornton says, "the residual oils from the coffee beans will coat the inside of the drum and get rid of 75 to 80 percent of the metallic taste after one seasoning roast. After that first roast, I think it takes months to complete the remaining 30 percent of the seasoning as the carbonized deposits coat the surface of the drum to the point of leaving a light shiny sheen on the drum.

continued on page 26

This helps eliminate hot spots and coats the entire drum surface, preventing the release of metallic odors to come in direct contact with the beans."

Season for Function

The metal of a drum cannot only affect the taste, but also the way the roaster functions and, in turn, the quality of the roast. Roast

defects can be reduced through the proper seasoning of a drum. The seasoning functions in the same way that butter, fat or Teflon does; it separates the food from the metal of a pan. The metal of a new coffee roaster, like an uncoated pan, can cause beans to stick to the walls of the drum. The uncoated surface of the drum can also have small catch points that, over time, will fill with carbon deposits. The seasoning functions as a way of reducing the chance of beans getting caught or stuck in the drum and blackening.

There are many different metals that are used to make drums. Every metal from cast iron to stainless steel will react differently to high levels of heat. The way that these metals and drums are made can determine the way that they will roast and effect the coffee. The rolling and forming of metal can create stresses that create hot spots, which can contribute to tipping and scorching during the roast process. This is when the outer edges of the beans develop an uneven color because they have been exposed to overheating. The metal will not appear to have an inconsistent thickness, but within the structure of the metal there are weaker and stronger areas. Annealing is a way of treating the metal so that the microstructure strengthens and hardens, creating a consistent heating surface. This is a process that requires the metal to be heated to temperatures well beyond those necessary for roasting coffee.

Ric Rhinehart, executive director of the Specialty Coffee Association of America says that, "this heating and holding

process results in steel that is more consistent as a conductor, and may (again, no scientific study here) contribute in a minor way to more consistent roasting." This process of annealing, when properly performed, alters the structure of the metal to create a consistent camber for transferring heat to the beans. The transferring of heat determines the consistency of the roast and the control that a roaster will have over the profile of the roast. Each and every metal will react differently to high levels of heat and annealing. There are some roasters that will deliver a consistent heat across the entire surface of the drum and others that will not. In observing the prominence of tipping a scorching you can determine it there are hot spots in the drum and whether or not it is necessary to anneal the metal of the drum.

There are roaster manufacturers who have recognized

> The idea of seasoning a roaster can and will be disputed for as long as people continue to roast coffee.

the concern of tipping and other roast defects because of hot spots. The drums of some roasters, such as Probat-Werke, use a double-walled system where the air between the two drum claddings serves to transfer the heat to the metal that is in contact with the beans. This creates an even heat that reduces the chance of tipping due to hot spots. They may also use thermal protection shields so that only the hot air is used in the transferring of heat to the drum to insure that no hot spots occur. In this case, manufacturers such as Probat recommend seasoning batches, not to alter the structure of the metal, but

continued on page 28

to create a coating inside of the drum to prevent the coffee from becoming directly in contact with the metal.

The hot spots that result in older or different styles of roasters can be alleviated, not only with annealing, but also through acquiring build up in the roaster. Experienced roasters will heat their coffee until carbon deposits are created in order to develop a carbon shell on the inside of the roaster that will serve as a second wall that evenly transfers heat to the beans. Tracy Allen from Brewed Behavior, a wholesale coffee roasting specific consulting company, recently seasoned a new five-kilo US Roaster Corp roaster for a client. It was not until after seasoning the roaster that Allen was able to acquire his desired results.

"I can only assume that by extracting the oils and filling the pores of the steel it contributed to a more even heat," Allen says. "Perhaps the layer of carbon helped eliminate hot spots and tipping as well."

The metal that manufacturers use and the method they choose for applying heat contribute to the recommendations that they make for the seasoning of their roasters. Diedrich Manufacturing, Inc., is one of the many manufacturers that inform their customers about the importance of seasoning their drums. Diedrich Manufacturing, Inc., provides a roaster manual for their IR series that includes a section titled "Seasoning The Roasting Drum." The metal used for their IR series drums is non-perforated carbon steel heated with a highly efficient gas infrared heating system. This heat is applied to the drum directly and with heat exchangers that redirect the heat to the drum. The manual that Diedrich Manufacturing, Inc., reissued with their equipment in August of 2007 recommends roasting seasoning batches to high temperatures, but not to the point of igniting the coffee. Diedrich Manufacturing, Inc., have a high limit system that will turn off the gas at 465 degrees; prohibiting a roaster, under normal circumstances, to ignite the beans. Diedrich Manufacturing,

Inc., recommend the seasoning of coffee roasters to not only impregnate the metal of the drum but also to allow a roaster to, "become familiar with the roaster's controls and the roasting process itself."

There is no formula to the seasoning of a roaster, but there is an understanding that can be had for every type of roaster. Tom Owen from Sweet Maria's says that, "roaster seasoning seems better if misinterpreted to mean the person running the machine, not the machine itself." Owen has roasted on a variety of roasters from all over the world and believes that a layer of build up would have a positive effect on a roaster.

The idea of seasoning a roaster can and will be disputed for as long as people continue to roast coffee. There are a variety of metals used to make many different sizes of roasters. Each roaster will have its own character and will react to heat in a different way and contribute to the taste of coffee in a different way. There is no formula to the seasoning of every roaster as there is no formula to the roasting of every coffee. As each roaster approaches their craft they must season themselves with the machine they are using and draw upon the experience of others who have used and seasoned the same roaster or similar roasters. A roaster must understand how the character of their machine will effect the character of the coffee that they roast.

In ERIC FAUST*'s right pocket, he carries a tamper and in his left, a cupping spoon. Most days he can't figure out if he is more of a barista or a roaster. He lives and breathes coffee, learning everything he can while still trying to sleep at night. He has worked in many different roles in the industry, but is currently working at the Black Sheep Coffee Café in South St. Paul, Minn.*