



# the Anatomy --- OF A --- ROAST PROFILE



SO... YOU'VE READ THE BOOKS, THE WEBSITES AND DONE THE ONLINE ROASTING COURSE, TRIED TO FOLLOW THE INFORMATION & PROFILES PRESENTED & YOUR ROASTING MACHINE STILL WON'T PRODUCE THE RESULTS YOU'RE AFTER?

Having the awesome opportunity to regularly visit roasters & be on a different roasting machine pretty much every second day of the week, I have seen & heard it all!!

The biggest thing I see is that, no matter what you do research wise & whichever profiles you try to copy/follow, **if you don't truly understand the green beans you are roasting & how your roasting machine 'cooks'/'roasts' then you will never get the flavour results you are after.**

And, believe me, I have seen some astonishing techniques/ approaches being used as a result of roasters misunderstanding or not taking the time to understand everything about their green beans & their roasting machine!

**Roasting is a craft and a skill that takes time to learn.** It is confronting because you have to make some decent mistakes in order to improve. No-one likes to fail – but in roasting you must! There are no shortcuts!!

**In order to improve you must experiment, collect a truckload of data & you must taste your coffee!** If you are in any way lax with these then you will never achieve Roasting Nirvana!

So, before you grab that cricket bat and take out your frustration on & blame your roasting machine (instead of yourself!), have a look at your own processes, general understanding of your green beans & roasting machine & I guarantee you are not owning up to what you are doing (& not doing) with your roasting approach!

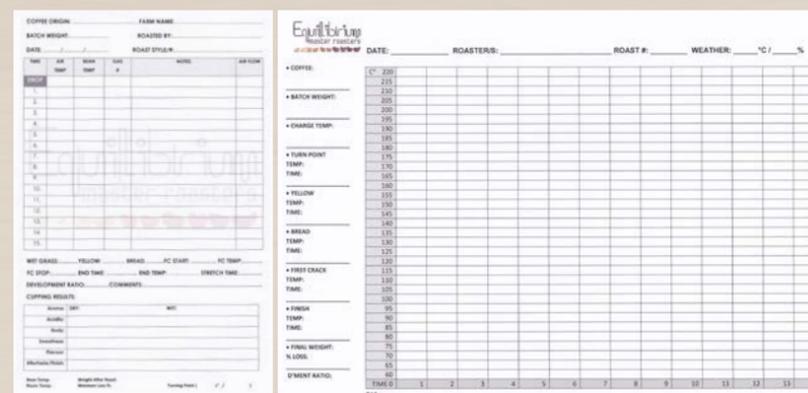
In past articles – *Beyond the Cooling Tray* and *The Heat is On* – I have been laying down a heap of information to support what we just touched on in the lead up to our next topic – Profiles - which can mean a few different things.

Firstly, we can be talking about the Flavour Profile of a coffee – how the coffee tastes, the mouthfeel, the acidity, sweetness, body balance etc. These flavour profile characteristics are of course determined by the coffee bean itself but are also then greatly impacted by the Roast Profile.

A Roast Profile is a way to record our actions and decisions in response to feedback from the beans as they respond to the application of heat on a particular roasting machine as we try and encourage an intended end flavour for a specific coffee bean.

**Hence, a Roast Profile is basically recording what happened during the roast and what adjustments were made to affect the flavour/outcome.**

There are a few ways to record a Roast Profile – either manually (in a table or graph format - see below), or with data logging programs such as Cropster, Roast Log, Artisan, Roastlogger, Roastmaster, Coffeesnobs, just to name a few!



**So, how do we know what flavour is being affected/ developed in what part of the Roast Profile?**

**To get to this, we need to know what makes up the backbone of a Roast Profile.** What elements are we commonly recording thus contributing to our decisions on how to roast a specific coffee bean in a certain way on a particular roasting machine.

**It is important to remember that every aspect of the coffee bean and the roasting process are variables in the equation** as we touched on in previous articles.

**Firstly, the measurements/information you collate before and after a roast (pictured below) can be very helpful and contribute to the success/failure of a Roast Profile:**

**Before starting a roast always consider:**

- Moisture content – water acts as a catalyst
- Density
- Screen size
- Process
- Batch weight
- Environmental conditions of roasting room
- Roast batch number for that day
- Roasting system – conductive vs convection vs radiant – understand this to determine optimum charge temp, batch weight, turn pt, heat application for the roast
- Desired time of first crack & length of roast
- Desired development ratio & weight loss

**General Roasting Notes:**

- Know your Roasting Machine: heat transfer – conduction vs convection vs radiant, capacity of drum, drum speed, airflow setting, burners/gas capacity and type – direct/indirect and controls (modulating dial vs switch/button), flue design
- Exhaust/env. temp should always be hotter than the bean temp. throughout the roast
- Correct placement of diameter of the bean temp probe is essential to accurate bean temp readings
- Always start a roast with sufficient energy
- RoR should be declining steadily on approach to first crack and for the rest of the roast
- Always cool beans efficiently within 5min from end of roast
- Always idle the roaster consistently in between roasts
- Always work/plan methodically and consistently
- **Always keep thorough roasting records and cupping notes**
- Making mistakes is the only way to learn!

**Then there are the more measurable elements/events that make up the backbone of and are recorded on the Roast Profile:**

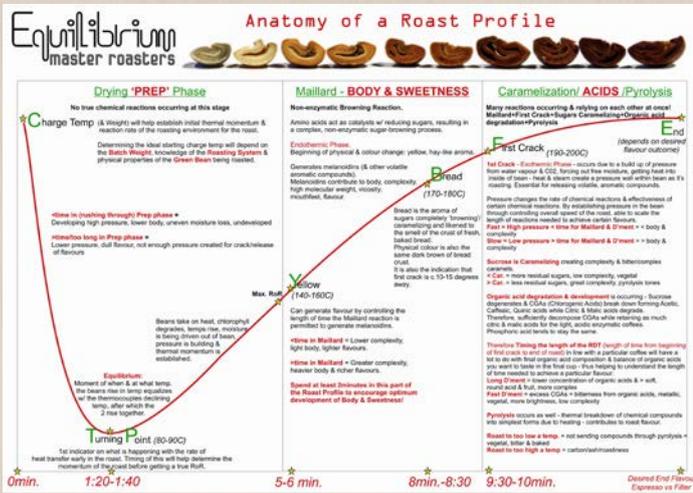
- Burner Adjustments
- Charge Temp – starting temperature
- Turning Point – point of equilibrium between the beans & the drum
- Rate of Rise (RoR) – amount of degrees per minute to minute
- Timing of Colour changes – Green to Yellow to Bread/Browning reactions
- Time & Temp of First Crack
- Timing of First Crack to End Roast Time – often referred to as RDT: Roast Development Time
- Time between First & Second Crack
- Total Time & End Temp of roast
- Development Ratio - A Time Ratio: % of the time of first crack in relation to the overall time
- End roast Weight Loss %: indicates how much weight (moisture) of the initial mass was lost in the roasting process
- End Roast Colour: can be quantified by Agtron or ColorTrack values

➤ So, now that we know the key elements of the Anatomy of a Roast Profile we can then divide the Roast Profile into sections & really see which part of the Roast Profile is affecting which part of the desired end flavour.

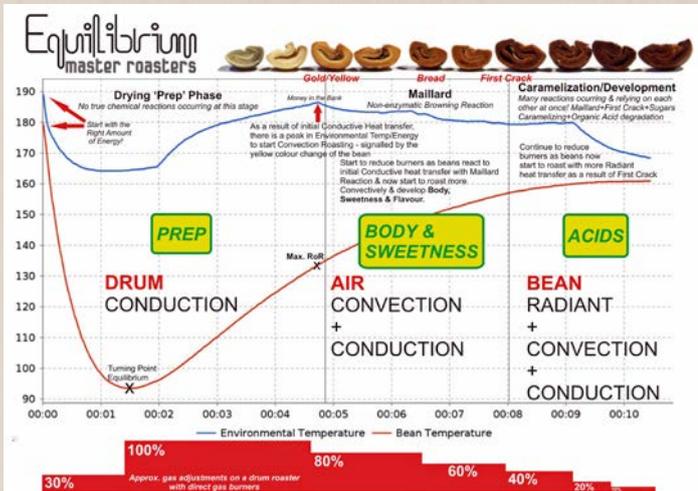
I like to divide a Roast Profile into 3 key sections:

1. **Prep** – setting the base for the overall momentum of the roast
2. **Maillard** - Body & Sweetness
3. **Acids** & overall end flavour

In the diagram below, along with the 3 sections, are the key 'measurable' events/checkpoints we listed before (except for Burner Adjustments & RoR - which we will cover in more depth in the next issue), then defined at the bottom by a desired timeframe in which these events are to occur in order to achieve a desired end flavour.



So – as we alluded to in previous articles – in the Anatomy of a Roast Profile there is an enormous amount of information being used to help make decisions on how to roast & achieve a desired end flavour from a specific coffee bean on a particular roasting machine/system...as can also be seen in the Heat Transfer Profile graph for a drum roaster with direct gas burners:



I then like to put key events/checkpoints from the Roast Profile together onto a Daily Roast Log Sheet that I keep next to me to refer to when I am cupping:

**Equilibrium Master Roasters**

DAILY ROAST LOG

DATE: \_\_\_\_\_ ROASTING ROOM ENVIRONMENT: TEMP °C/HUMIDITY %  
 BEFORE PRE-HEAT: \_\_\_\_\_ MID-MORNING 9am: \_\_\_\_\_  
 ROASTING MACHINE: \_\_\_\_\_ AFTER PRE-HEAT: \_\_\_\_\_ MIDDAY 12pm: \_\_\_\_\_  
 OPERATOR/S: \_\_\_\_\_

COFFEE	FIRST CRACK TIME	FIRST CRACK TEMP	TOTAL ROAST TIME	END ROAST TEMP	STRETCH DEGREES	STRETCH TIME	DEVELOP. RATIO %	GREEN KG IN	ROASTED KG OUT	WEIGHT LOSS %	AGTRON WB	AGTRON GND	AGTRON SPREAD
1.													
2.													
3.													
4.													
5.													
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With this Roast Log you will start to see patterns in your stretch degrees, RDT, weight loss etc. which will then further help to define your roasting mantra/style of Roast Profile & desired end flavours with some key parameters, allowing you to consistently replicate roasts & make better decisions on future roasts with different beans.

Logging your roasts & collecting as much data as possible – whether it's manually or with a data logger - is key to learning from & reacting to what you find in the cup. By comparing your cupping notes – always the most important measurement of all – to your Roast Profiles, you can begin to see what adjustments are helping to better express the flavours you are after in a specific coffee bean.

Overall, any form of visually logging your roasting as a Roast Profile is very helpful as it gives you a path/road map to follow in line with the bean's physical colour changes along the way.

A Roast Profile also allows you to better understand the idiosyncrasies of & what you need to do to get the best results from your particular roasting machine/system.

Roast Profiles also encourage consistency amongst roasting team members, which then means a more consistent product being produced, thus strengthening your brand.

One great exercise you can do – which is also the basis of my roasting course & will be the topic (Pimpin' Profiles) in the next issue - is to roast the same coffee 3 different ways (Sample vs Filter vs Espresso), then analyze & connect the Roast Profile to a particular desired end flavour – because the same Roast Profile is not necessarily going to be the best profile/roasting approach for a specific coffee bean/ particular roasting machine/ desired end flavour!

Hope you all enjoyed some sweet success at The Golden Bean & I look forward to Pimpin' some Profiles in the next issue!!

**ABOUT THE AUTHOR:**

Anne has over 23yrs experience in the coffee industry, having spent the last 10yrs roasting in both Australia & the USA at all levels from commercial to specialty. Anne is a Certified Q Grader, Member of the Executive Council for Roasters Guild USA, Head Judge & twice winner of The Golden Bean. Now consulting, with her company Equilibrium Master Roasters, roasters can engage Anne as a consultant or attend the monthly roasting course in Melbourne.

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