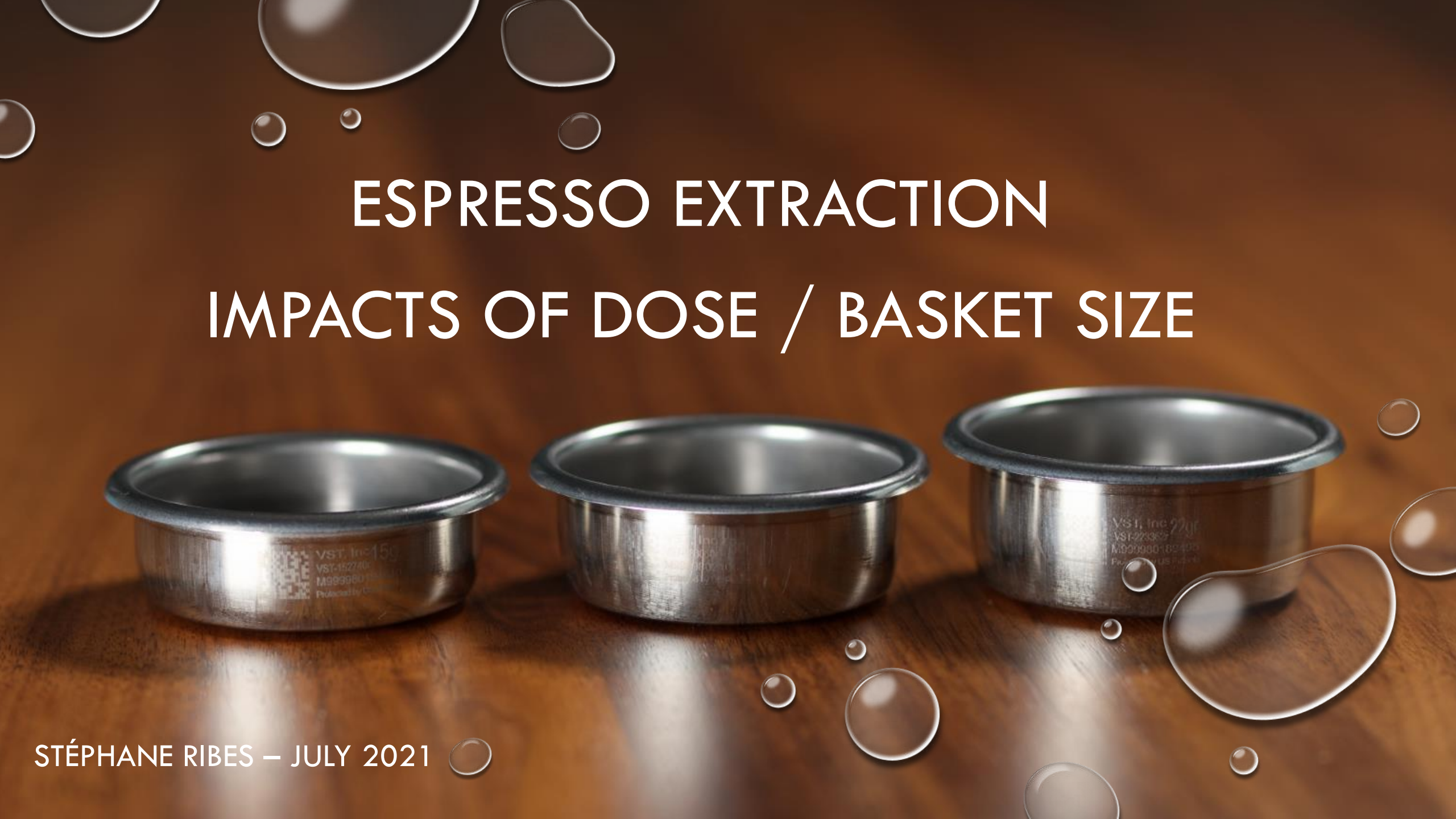
ESPRESSO EXTRACTION

IMPACTS OF DOSE / BASKET SIZE



STÉPHANE RIBES – JULY 2021

DOSE / BASKET SIZE IMPACTS ON ESPRESSO EXTRACTION

Context / Objectives:

- Over the past 2 years, I prepared my espresso shots with growing coffee doses (and basket sizes)
- In parallel I implemented new equipment and techniques that favor more uniform extractions
- Simultaneously, the average extraction yield of my espresso shots has increased significantly
- The objective of this study is to quantify the impacts of dose and basket size on taste and extraction yield

Scope:

- **Coffee beans:** one single batch of washed Ethiopian beans from the Guji region, vacuum sealed in single doses and ground frozen with an **Ultra Grinder with SSP High Uniformity burrs** (100 RPM)
- **Filter basket / Coffee dose:**
  - VST 15 grams basket: 10.5 grams and 13.5 grams
  - VST 18 grams basket: 17.0 grams
  - VST 22 grams basket: 21.3 grams
- **2 sets of shots:**
  - ICM + BPLUS contact screen (in addition to the usual preparation with WDT and PorcuPress)
  - Flat coffee bed, no contact screen
- **Basic extraction profile (Lelit Bianca):**
  - 9 mL/s * pre-infusion to 3 bar, no bloom
  - Extraction with pump max pressure set at 8 bar and flow restricted to 4 mL/s *

** water flow rates measured without portafilter*

DOSE / BASKET SIZE IMPACTS ON ESPRESSO EXTRACTION

Main results for the tested setup:

- With a **flat bed of coffee grinds and no contact screen**, **the 22 gram VST basket led to much tastier cups and higher extraction yield values** (ca. 23.5%), compared to the **15g and 18g VST baskets** (< 22.5%)

- With **ICM + BPLUS**, **differences in EY when varying the dose were more limited**: from about 24.5% to 25% for the most tasty shots of a given basket / dose (same extraction ratio)
- The best shots with the highest dose in the **22 gram VST basket** were way tastier than those pulled with the **15 gram VST basket**, and marginally superior to those pulled with the **18 gram VST basket**
- The grind setting range leading to enjoyable shots was wider with the **22 gram VST basket**, compared to the **18 gram VST basket**

- **These results are consistent with the correlation that was observed in the past 2 years between dose and extraction yield, when the BPLUS screen was not yet used**

Additional observations:

- With the 22 gram VST basket **without contact screen**, I preferred quicker shots (30 sec for a yield of 49 grams) than with the BPLUS contact screen (33 to 42 sec for the same yield)
- With slower shots (finer grind settings) pulled with the BPLUS contact screen, the intensity of ICM (the height of the mound) had to be reduced to maintain an optimal radial uniformity of the extractions

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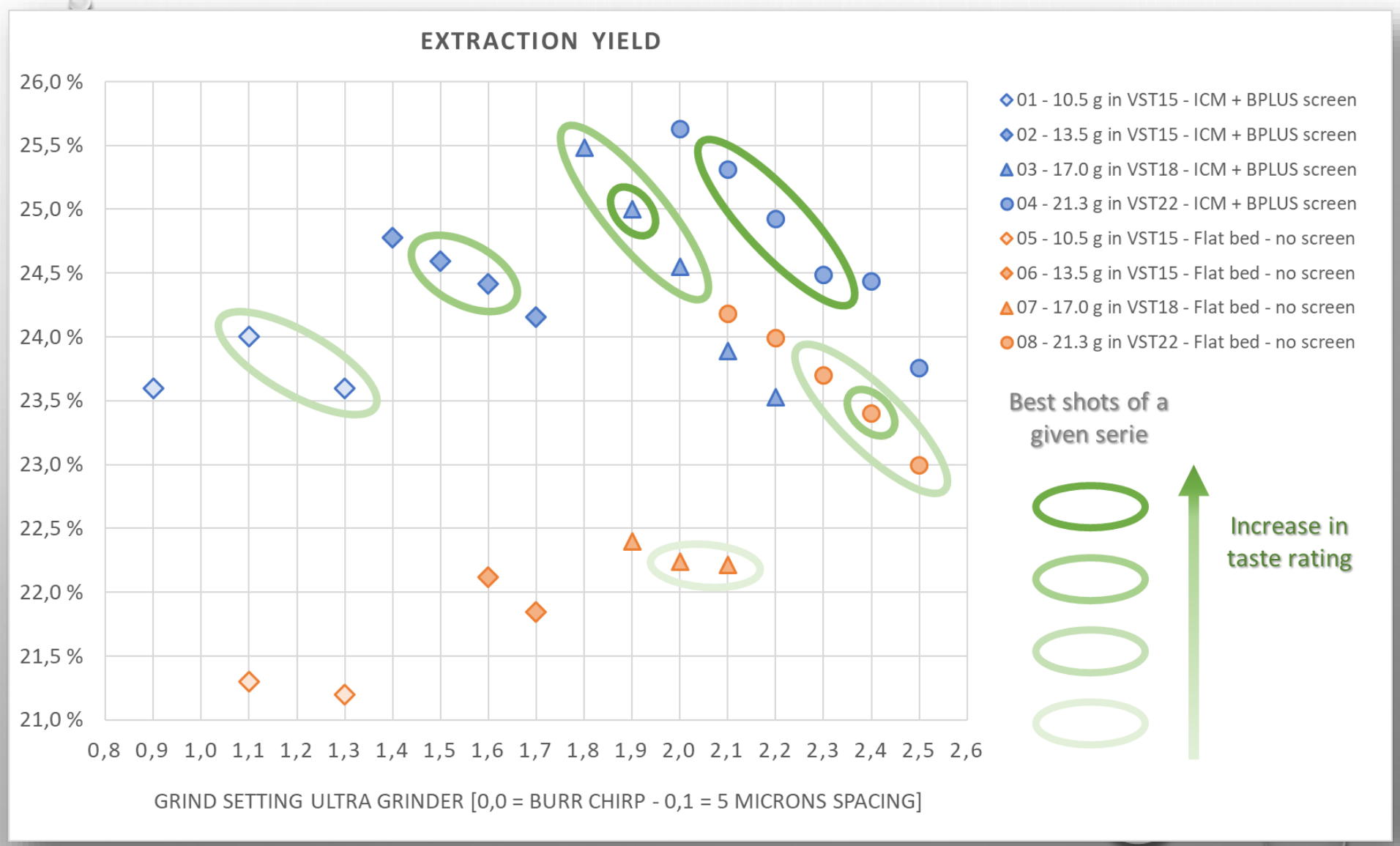

- **Tastier cups and higher extraction yield values with the 22 gram VST basket**
- More limited differences in EY and taste rating with **ICM + BPLUS**

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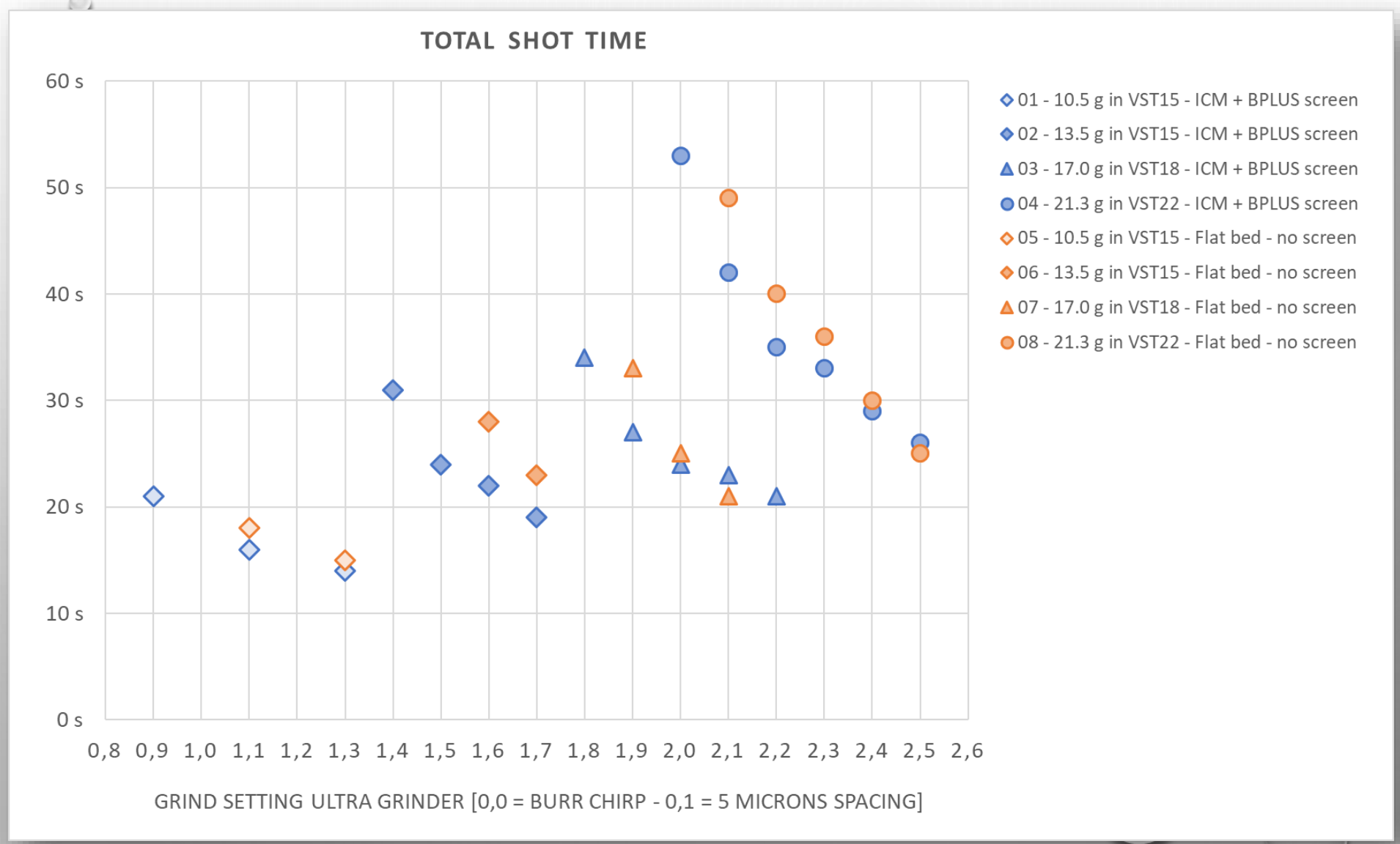

- For a given grind setting and yield, shots pulled with **ICM + BPLUS** flowed **generally faster** than with a flat bed and no contact screen, especially at smaller grind settings

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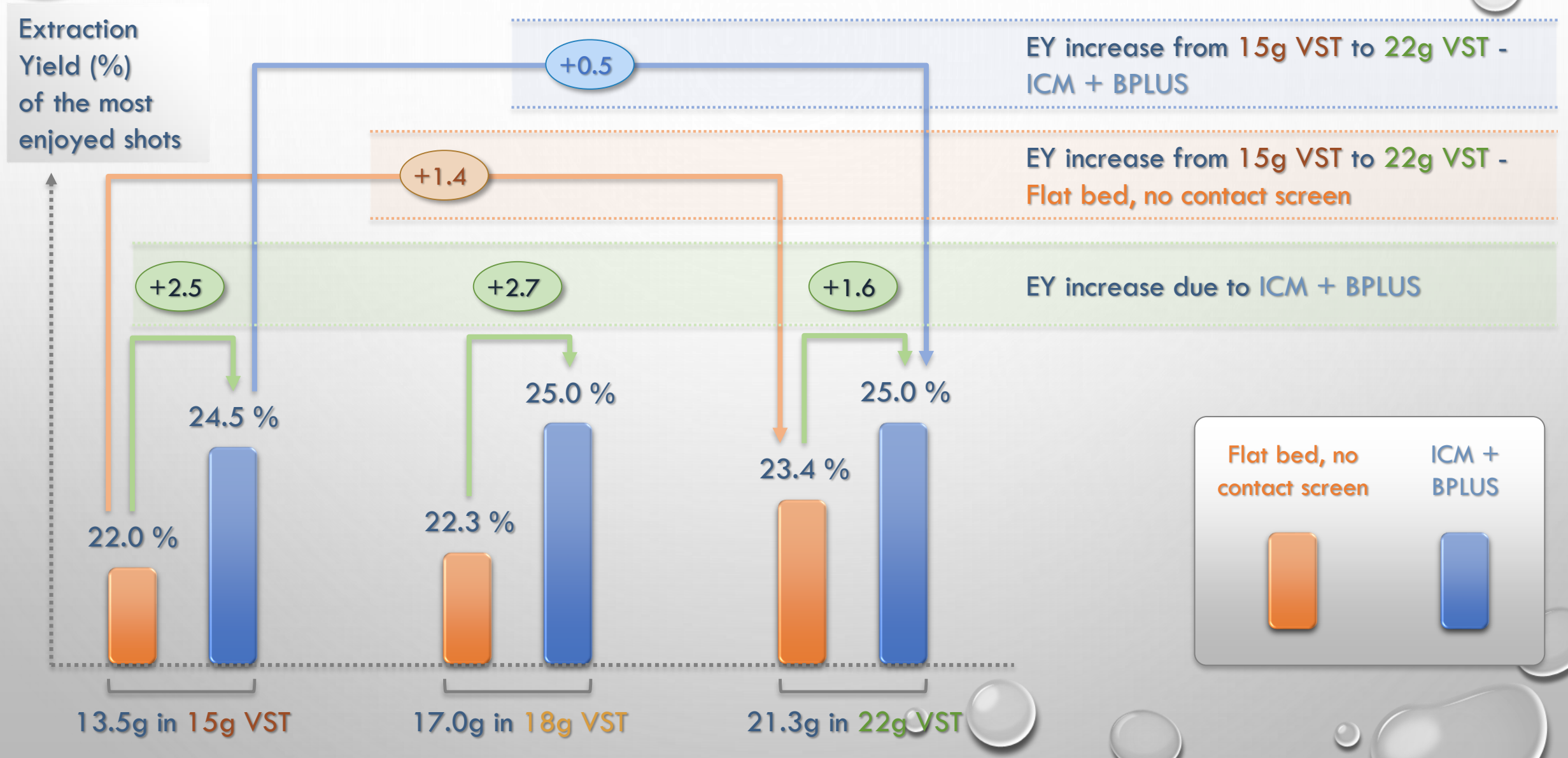

DOSE / BASKET SIZE IMPACTS ON ESPRESSO EXTRACTION

ICM, BPLUS contact screen




10.5g in 15g VST | 13.5g in 15g VST | 17.0g in 18g VST | 21.3g in 22g VST

Flat bed, no contact screen




IMPACTS OF DOSE / BASKET SIZE TEST PROTOCOL

- **Levercraft Ultra Grinder** – SSP High Uniformity blind burrs with Red Speed coating
  100 RPM – Grind setting mentioned from burrs touching
- Single dosing of frozen beans ground into the VST filter baskets (with a Decent funnel)
- **WDT** in the basket with a Levercraft WDT tool (8 needles of 0.4 mm diameter)
- For a single series of shots: **Dan Calabro's ICM (Inward Combed Mound)**
- SworksDesign **PorcuPress** v1 – standard density hex insert (109 needles of 0.8 mm diameter)
- For a single series of shots: **BPLUS contact screen** dropped onto the coffee grinds before tamping
- **Bravo Tamper,** flat base, 58.5 mm diameter, 26 lbs tamping force
- Montcalm water (Pyrenees, France), **adjusted to 35 ppm eq. $CaCO_3$ alkalinity and 80 ppm eq. $CaCO_3$ total hardness,** with sodium carbonate and Epsom salts
- **Lelit Bianca Espresso Machine – 90°C – Fixed extraction ratio: 1:2.3**
  9 mL/s pre-infusion to 3 bar, no bloom – 8 bar max pressure (paddle position: 4 mL/s without portafilter)
- TDS measurements: Atago PAL zeroed with Montcalm water – no filtering of the coffee samples – all samples measured at room temperature after vigorous stirring – 1 data point = average of 3 to 5 measurements of each coffee sample