

IFPRI Project update – 3D Tunable Agglomerates

Meeting Date	October 7 th , 2019 – 1200-1300 Basel (CEST)		
Team members	<input checked="" type="checkbox"/> Amini, Negin		Deakin
	<input checked="" type="checkbox"/> Golchert, Dennis		Roche
	<input type="checkbox"/> Gorowara, Rajeev		Corteva
	<input checked="" type="checkbox"/> Hapgood, Karen		Deakin
	<input type="checkbox"/> Mort, Paul		PrM ³ /IFPRI
	<input checked="" type="checkbox"/> Zhang, Jun		Deakin

Minutes	
Project Update	<p>Experimental update – Negin/Jun</p> <p>Latest results of recent experiments were presented.</p> <ul style="list-style-type: none"> • <i>Photoelasticity of 3D printed agglomerates</i> <ul style="list-style-type: none"> ○ Printing direction doesn't appear to be important ○ Veroclear less rigid than Acrylic or Polyurethane used by Karen Daniels ○ FEA ongoing ○ Coffee bean ~ 11mm, granule ~6mm • <i>Agglomerate breakage</i> <ul style="list-style-type: none"> ○ Granules made via binder jetting of gypsum and a water based binder manufactured with differing levels of saturation (1 +/- 0.5) ○ Results appear reproducible for all saturation levels ○ Suggestion: Confirm polymer granule breakage behavior in regards to printing orientation • <i>Liquid imbibition into a porous substrate</i> <ul style="list-style-type: none"> ○ Hydrophilic and hydrophobic surfaces tested. ○ Voronoi and lattice structures tested; porosities different between structures ○ Drop penetration still occurs with hydrophilic surface, which differs from Washburn equation assumptions • <i>Powder flow</i> <ul style="list-style-type: none"> ○ Repeat of Marigo and Stitt paper¹ with spheres and briquettes tested experimentally and with DEM (Rocky) – EDEM also to be evaluated ○ Reproducible results of powder flow with two different particle shapes conducted with FT4 <p>Project update – Negin/Karen</p> <p>Publications</p> <ul style="list-style-type: none"> • Four publications planned to be submitted before end 1Q20. • Review of 3D printing is authored to be relevant to IFPRI project – split into wet and dry sections <p>Next meeting - Dennis</p> <p>Next meeting is planned for 6th January 2020.</p>

¹ M Marigo, EH Stitt, "Discrete Element Method (DEM) for Industrial Applications: Comments on Calibration and Validation for the Modelling of Cylindrical Pellets", KONA Powder and Particle Journal 32, 236-252

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Presentation	
	IFPRI reievw Oct 2019.pdf

Distribution	
Team Members, Willie Hendrikson, Matt Maille, Jim Michaels	