

## POSTER SUMMARY

**QUANTIFYING PAN BOILING BEHAVIOUR**DU CLOU H<sup>1</sup>, FOXON KM<sup>1</sup>, BARKER B<sup>1</sup> AND GUEST KL<sup>2</sup>

<sup>1</sup>*Sugar Milling Research Institute NPC, University of KwaZulu-Natal, Howard College Campus, Durban, 4041, South Africa*

<sup>2</sup>*University of KwaZulu-Natal, Howard College Campus, Durban, 4041, South Africa*

*hduclou@smri.org kylanguet@gmail.com*

**Abstract**

In South Africa, pan boiling is often reported to demonstrate poor behaviour towards the end of the season. The definition of poor pan boiling behaviour is somewhat nebulous, with massecuites simply referred to as being 'hard to boil'. Factors used to describe this behaviour include slow boiling, slow crystal growth and low evaporation rates. In general, pan boiling is influenced by the quality of the massecuites. Massecuite viscosity impacts on the crystallisation process and is influenced by several elements including the brix, temperature, available crystal surface area and the nature and concentration of impurities. Gums are polysaccharides which make up a large percentage of the organic impurities present in massecuites. Based on the premise that gums increase massecuite viscosity, the Sugar Milling Research Institute NPC (SMRI) has undertaken to characterise these and develop new approaches to massecuite viscosity modification. A measure of pan boiling behaviour is required to relate massecuite physicochemical properties, such as viscosity, to the quantity and nature of polysaccharide impurities. Data were collected from various C-pan boilings of a South African sugar mill over the 2014/2015 sugar milling season. Factors examined from the data include the overall change in mass of crystals, linear crystal growth rate, heat transfer coefficient, average supersaturation coefficient, agitator current as an indicator of viscosity, average evaporation rate, average feed rate, exhaustion and crystal content per boiling. This poster explores these factors as measures for quantifying the boiling characteristics of the massecuites.

*Keywords:* pan boiling, massecuite, viscosity, gums, polysaccharides, crystallisation