

ABSTRACT

CROOK, TERESA M.* Research Agronomist, Michigan Sugar Company, Carrollton, MI 48724. - New clarifier for hand-pressed juice from brei samples.

At Michigan Sugar Company, hand-pressed juice comes from growers' tare samples and research beets. Each beet is sawed lengthwise with a large (24-inch) diameter single blade saw. From this saw, a "brei sample" is collected. The brei consists of fine pieces of tissue from each beet. Brei is placed onto a reinforced paper (similar to a grease rag) and squeezed to extract juice from the pulp. This "raw" juice is poured into a plastic bottle and frozen for later analysis.

Clarification of this raw juice for determining sucrose content has changed four times over the past 27 years. In 1965, research samples at Michigan Sugar Company had sugar content determined with powdered lead subacetate as a clarifier. Then in 1971, sugar content was determined with lead subacetate on composite growers samples. This clarification of both research and growers samples continued until 1986. Because of health and environmental factors, lead subacetate could no longer be used and consequently, a liquid clarifier of aluminum chloride plus ammonium hydroxide was used to clarify both growers and research samples until 1990. Dispensing precise quantities of this clarifier was difficult, so in 1990, a powdered zinc chloride/sodium hydroxide clarifier was initiated thanks to the help of Manilal Dedhia, general chemist at Michigan Sugar Company.

In 1992, raw juice from both grower and research samples was clarified with a powdered ABC Sugar Clarifier^R (Dark Formulation) from Baddley Chemicals, Inc. One teaspoon (approximately 4 grams) of ABC is added to 50 mls of raw juice. (This is probably "overkill" on the amount needed, but we have had no clarification problems on any research or grower samples with this amount.) The sample is mixed with a blender for 20 seconds, poured into a filter, and the clarified juice drips into a small one ounce cup. Clarified sugar juice is siphoned through our Rudolph^R Saccharimeter. This reading is used to calculate percent sucrose content on a beet basis.

When using the ABC Sugar Clarifier on hand-pressed juice samples, a few specific conditions must be met. First, the three separate ABC compounds need to be mixed together and "cured" at least three days prior to use. Otherwise, the raw juice sample will thicken when mixed and not enough clear juice will drip through for an accurate saccharimeter reading. Second, the temperature of the juice sample cannot be too cold (below 15°C) when ABC is added, or the sample will also thicken when mixed. Third, the mixed ABC will "stay good" for 10 days. The ABC clarifier generated very consistent saccharimeter values and had an excellent correlation ($r^2=.99$) with lead subacetate.