Lowering the color of crystals in sugar factories

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Like diamonds, sugar crystals ideally are very pure and low in color. Now studies led by U.S. Department of Agriculture (USDA) chemist Gillian Eggleston have provided a better understanding of the source of undesirable color in factory sugar.

Eggleston works in the Agricultural Research Service (ARS) Commodity Utilization Research Unit in New Orleans, La. She conducted the studies with Barbara Muir of the Sugar Milling Research Institute in Durban, South Africa. ARS is USDA's chief intramural scientific research agency.

Environmental concerns have led to a shift away from burning cane in open fields to remove "trash," which is impurities such as leaves, tops and muddy soil that piggyback on sugarcane from the field into the factory. More trash comes into the factory on green cane than on burnt cane.

Traditionally, several processes have been used in factories or refineries to lower or remove color, but they are all expensive. The authors estimate that for every 1 percent increase in trash levels, there is an increase of about 50 international color units for raw sugar and 25 such units for refinery sugar. They also found that for every 1 percent increase in trash, there is about a one-fifth-percent drop in recoverable crystals. That translates into upwards of a $100 million loss per year to the U.S. sugarcane industry.

Based on samples produced across a pilot plant that simulated all factory processes, green cane detrimentally affected purity, sugars, ash and color as well as physical properties such as clarification performance, according to Eggleston. The data show that undesirable color in factory sugar is actually coming from the green leaves and the growing-point region which occurs at the top part of the stalk.

Eggleston's collaborative work has led to a recommendation to sugarcane growers and processors that even a small reduction-such as less than 10 percent-in total trash levels processed at the factory could be more efficient and cost-effective than other factory color-removal processes.

More information: This award-winning study was published in the *Proceedings of the South African Sugar Technologists' Association*. Read more about this research in the May-June 2011 issue of Agricultural Research magazine: www.ars.usda.gov/is/AR/2011/ma … 11/sugarcane0511.htm

Provided by United States Department of Agriculture

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