

MARTIN, SUSAN S.¹, and LARRY E. GHOLSON*², ¹ USDA, Agricultural Research Service, 1701 Center Ave., Fort Collins CO 80526 and ²The Western Sugar Company, 1700 Broadway, Suite 1600, Denver CO 80290. - Sugarbeet decomposition in factory storage piles: the good, the bad, and the ugly.

Sugarbeets harvested in 1991 were affected by unusual weather conditions while held in storage piles at factories in CO, NE, WY, and MT. An early, exceptionally cold period caused partial pile freezing, especially at the surface and in "chimneys" paralleling cooling air ducts. This was followed by a period of exceptionally warm temperatures during which frozen beet zones thawed, resulting in external and internal zones of decomposing sugarbeets which had adverse effects on factory processing. Our objective was to determine whether accurate decisions on whether to discard decomposing beets could be made solely on the basis of visual appearance. Samples (4 beets/sample) were obtained from three factory districts (CO, NE, WY/MT), classified into a visual rating class, and analyzed for pol sucrose at the factory tare lab. Another portion of the filtrate was frozen and transported to ARS, Ft. Collins, for HPLC analysis of "true" sucrose, glucose, fructose, raffinose, and betaine. Visual appearance did not accurately predict either sucrose content or content of non-sucrose sugar impurities. In good-appearing, solid beet samples, pol sucrose typically was in error by 3 to 10%; such errors rose above 10% for many samples classified as good but having true sucrose of 10-14% (% fr wt), and increased to several hundred percent for the many samples with true sucrose <8%. Raffinose, glucose, and fructose increases were associated with decreasing sucrose except in samples with <8% sucrose, but visual prediction again was not accurate. We conclude that neither visual appearance nor polarimetric sucrose measurement is sufficient to determine whether or not to process decomposing sugarbeets.

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