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Quick tests for sugar beet respiration.

This study explores the development of a cost-effective and accelerated method for ranking sugar beet varieties based on their respiration rates, as a measure of storage stability. The COBRI group, in collaboration with NBR, utilized SenseCAP CO₂ sensors to assess respiration in air-sealed containers, containing hand-harvested sugar beet samples. This new method, which provides results within 2 days, showed high correlation ($r^2 = 0,86$) with advanced long term respiration measurements from IRBAB's chambers, indicating its potential utility for quickly estimating storage-related sugar losses. The correlation between respiration and storage losses in this trial was high ($r^2 = 0,82$). While the new method is only able to rank varieties according to respiration rate, this rate can be used to estimate storability of varieties. However, its weak correlation with total post-harvest sugar loss is due to its inability to capture losses from mold and rots during extended storage, particularly in machine-harvested beets in practice, which are significant sugar loss factors. Consequently, mechanical tests, such as penetration tests, may be more predictive of such deterioration-driven losses. This research provides a foundation for future iterations of rapid assessment tools to evaluate the storability of varieties, highlighting the need for developing quick tests for mold and rots to better estimate long-term storage losses.

