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A challenge facing the sugar industry is the need to increase sugar yield in early harvested sugar crops. Plant Sensory Systems (PSS) has identified a naturally occurring plant compound for use as a foliage application on sugar crops that significantly increases sugar yield. The compound, which has FDA Generally Regarded as Safe (GRAS) status, has been tested with multiple sugarbeet genetics, environmental conditions, and timings of application. PSS' proprietary formulation has been tested in controlled greenhouse conditions in Beltsville, Maryland, coded trials on Eastern Shore, Maryland, and multiple commercial fields in Nebraska. The PSS' formulation was applied to sugarbeet as a foliar treatment at either two or three weeks prior to harvest. Samples of the treated and untreated beets were harvested, sugar content was analyzed, and root yield was determined. For sugarbeet treated with the formulation, overall average sugar yield was 7% higher compared with the untreated matched controls. In early harvest or less mature beets, the increase in sugar yield was the result of higher sugar content. In more mature beets the increase in sugar yield was impacted by both root yield and increased sugar content.