

UTILIZATION OF PLANT GROWTH REGULATORS FOR SUPPRESSION OF SUGARBEET ROOT YIELD

Metzger, Michael S., Emma L. Larson and Bradley L. Schmidt
Minn-Dak Farmers Cooperative, 7525 Red River Road, Wahpeton, ND 58075

During the last decade, the sugar industry in the Red River Valley of Minnesota and North Dakota has seen a steady upward trend in overall crop yield and quality. These average annual gains are a reflection of the introduction of glyphosate-tolerant cultivars, the agronomic advancements in technology, efficiency and production practices adopted by the region's beet sugar producers. On average, commercial fields grown for Minn-Dak Farmers Cooperative from 2008 to 2017 have experienced an increase in total root yield per harvested acre of 0.98 tons per acre per year. On occasion, these root yield increases have resulted in commercial acres remaining unharvested due to the overall crop volume (tonnage) exceeding the limitations of the cooperative's storage infrastructure and factory processing capabilities. Trials conducted from 2016-2018 investigated the use of two commercially-available plant growth regulators (PGRs) as candidates to suppress late-season sugarbeet root growth without sacrificing overall sugar content or purity. Experiments were arranged in a split-plot randomized complete block design with six replications. Foliar applications of PGRs Ethophon and Atrimmec served as whole-plot treatments and were applied 30 days prior to harvest at their labeled rates of 9 fl oz/A and 2.5 pt/A, respectively. Rates ten-fold of the highest labeled rate for each product were also evaluated. Sub-plot treatments consisted of two commercially-available cultivars per experiment with a total of four cultivars (ACH 352, ACH 830, Hilleshog 4062 and Hilleshog 4302) being evaluated between the three growing seasons. Phenotypic damage (leaf speckling) from the foliar treatments of Ethophon was noted on all cultivars evaluated and a reduction in canopy height was evident across all treatments of Atrimmec. Results indicated sugarbeet tonnage could be significantly reduced utilizing the ten-fold rate of Ethophon and both the labeled and ten-fold rate of Atrimmec. Root yield suppression exceeded four tons per acre in several treatments. Even though the sugar content and purity percentage were both negatively affected by the application of these PGRs, the final sugarbeet yield and quality were such that it would still be economically feasible to harvest and process, resulting in an alternative to leaving a portion of the crop unharvested.