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Case histories of early testing to identify sugarbeet lines with high performance.
Early testing is used to estimate the genetic potential of an individual or line at an early stage of development. The efficacy of early testing to identify improved lines of sugarbeet for general combining ability has been inconclusive. Monogerm line C762-17 was released in 1989 and lines C790-6, C790-15, and C790-54 were released in 1992. C762-17 was identified from pair-plant crosses between specific lines without recombination. Individual S_0 plants within and among crosses were tested in 3-way hybrids. These tests identified plants that had better hybrid performance for sugar yield than their parental lines. Hybrids generated from S_0 plants within paired crosses were more similar in performance than hybrids among paired crosses. From population-790(C4) that had been improved by four cycles of S_1 progeny recurrent selection, 100 S_1 progenies were evaluated in three locations for components of yield and disease resistance. Based on these tests, eight S_1 progenies were selected and topcrossed. The S_1 lines that became C790-6, C790-15, and C790-54 had significantly higher hybrid performance than the corresponding population hybrid. The performance of these monogerm lines strongly support the usefulness of early testing in a sugarbeet hybrid breeding program.