

LEWELLEN, R. T.\*, and I. O. SKOYEN. USDA-ARS, 1636 E. Alisal St., Salinas, CA 93905. - Improvement and performance of populations of sugarbeet x *Beta maritima*.

As a consequence of its rather narrow genetic base, sugarbeet (*Beta vulgaris* L.) has been highly vulnerable to endemic diseases and pests, particularly in warmer and/or more humid environments. *B. maritima* is believed to be its ancestral species and should be an important and useful germplasm resource. An advanced sugarbeet breeding line was crossed to 59 accessions of *B. maritima* from the pre-1980 USDA collection. Individual F<sub>1</sub> and F<sub>2</sub> lines from each *B. maritima* accession were produced. Mother roots from the F<sub>2</sub> lines grown in a field plot were selected based upon nonbolting and agronomic type and composited to produce an F<sub>3</sub> population. The F<sub>3</sub> source and cycle 1 and 2 synthetics from it were evaluated in comparison to the sugarbeet parental line. Genetic variability was obvious in the sugarbeet x *B. maritima* populations for most traits examined. Selections for resistance to beet yellows virus and rhizomania based upon individual plant performance for sugar yield and root conformation significantly increased the performance of the respective synthetic when grown under diseased conditions. Even under mild disease exposure, the selected synthetics were superior to the F<sub>3</sub> source. The data suggested that an improvement for root and sugar yield also occurred. Compared to the sugarbeet parental line, root and sugar yield was higher but sucrose content and quality traits were poorer.

SEILER, GERALD J.\*, and D. L. DONEY. USDA-ARS, Northern Crop Science Lab., Fargo, ND 58105. - Collection of wild sugarbeet species (*Beta* spp.) from Europe.

Preservation of wild sugarbeet germplasm is imperative because of the continued loss of native habitats. Cultivated sugarbeet (*Beta vulgaris* L.) is presently based on a narrow genetic base. Wild *Beta* spp. have the potential of contributing unique genes for insect and disease resistance to cultivated sugarbeet. Since 1988, sugarbeet explorations have been undertaken in five European countries: France, Denmark, Belgium, Channel Islands (Guernsey and Jersey), and the Soviet Union. Seeds from 120 populations of *B. vulgaris* L. ssp. *maritima* (L.) Thell. (sea beet) were collected from France, 19 from Denmark, five from Belgium, five from Guernsey Island, and three from Jersey Island. The addition of the sea beet populations to the USDA-ARS *Beta* collection makes it the most complete in the world. Seeds from three populations of *B. corolliflora* Zoss., one population of *B. lomatogona* Fisch. et Mayer, and two populations of *B. macrorrhiza* Stev. were collected from the Soviet Union. The germplasm collected from the Soviet Union is the first seed of these wild species obtained in over 50 years. The wild sugarbeet germplasm collection is a valuable genetic resource. It's potential will be realized through systematic evaluation for specific characters.