in the C890 series will segregate for resistance to rhizomania and for monogerm, O-type, and genetic male-sterile traits. These lines should facilitate selection of rhizomania resistant, monogerm, O-type breeding and parental lines.

From the early-generation backcross lines that were subsequently released as C79-1 through C79-11 (3), plants resistant to rhizomania were selected and pair-crossed in the greenhouse under paper bags to genetic male-sterile, monogerm plants from C790. One or more backcrosses (Table 1) were made to C790 with resistant plants selected from each BC1F1 generation. Resistance to rhizomania was determined in 4-mo-old plants grown in BNYVV infested soil (2,3). Under these conditions, escapes were common, which led to lower than expected frequency of resistant plants in the subsequent generation. Traits other than resistance to rhizomania were largely disregarded. Thus, the C890 lines continue to segregate for multigerm types. Following the final backcrosses, resistant plants within each line were increased in bulk.

Table 1 lists the pertinent information for each line. As with the C79 series, sources of resistance included sugarbeet, Swiss chard, and weed and wild beet (B. vulgaris L. subsp. maritima). The allelism or relationship among these sources has not been fully determined, but some do appear to involve the same DNA markers (6). Line C890-8 with resistance from C50 appears to offer the greatest improvement in resistance to rhizomania over that conditioned by the Rz allele (2). In Imperial Valley (California) tests under combined effects of rhizomania and high temperature, the resistance factor or factors in C890-8 provided the highest level of protection and survivability (4).

Breeder seed is maintained by the USDA-ARS and will be provided to sugarbeet researchers in quantities adequate for reproduction, upon request to the author.

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References and Notes

The technical assistance of J.A. Orozco, J.K. Schrandt, and M. Alkhatib is gratefully acknowledged.


Registration of C913-70 Sugarbeet Germplasm

Sugarbeet (Beta vulgaris L.) germplasm line C913-70 (Reg. no. GP-189, PI 593691) was developed by the USDA-ARS and the California Agricultural Experiment Station in cooperation with the Beet Sugar Development Foundation and the California Beet Growers Association. It was released in 1996. C913-70 is a multigerm, self-fertile line with green hypocotyls and segregates for genetic male sterility (aa). It is a narrowly based line descended by bulk increases from one S1 progeny line. The second and third increases were from roots mass-selected for resistance to rhizomania caused by beet necrotic yellow vein virus (BNYVV). The S1 line was produced by selfing in the greenhouse one mother root selected for resistance to rhizomania from Population 913.

Population 913 is a multigerm, self-fertile, genetic male-sterile, facilitated random-mated population similar to C918 (PI 578079) released in 1993 that was undergoing population improvement. The S1 line was selected based on performance and nonbolting in an S1 progeny test. Experimental hybrids were produced in conjunction with subsequent seed increases. The line and experimental hybrids with resistance from Population 913 were evaluated in replicated field trials at Salinas, Davis, and Brawley, CA. On the basis of these tests, C913-70 was selected for resistance to rhizomania, erwinia, and bolting and where moderate levels of curly top and virus yellows resistances are desirable. Because C913-70 segregates for genetic male sterility, it potentially could be used as the C-parent to produce double-cross hybrids. C913-70 should be tested for its potential as a male parent to produce combined disease and bolting resistant hybrids. The line should be tested for its potential as a parental line to generate new breeding material.

Breeder seed is maintained by the USDA-ARS and will be provided to sugarbeet researchers in quantities adequate for reproduction, upon request to the corresponding author.