

sterility, and hypocotyl color. In the sugarbeet breeding program at Salinas, CA, these types of breeding lines have been called self-fertile, genetic male-sterile facilitated, random-mated populations (4). They are useful for population improvement and parental line extraction. C859 should be increased by harvesting seed from randomly mated, male-sterile plants. This ensures that in the new synthetic each individual plant is either male sterile (a_1a_1) or heterozygous pollen fertile (A_1a_1). At the time of its release, a cytoplasmic male-sterile version (C859CMS) was also made available.

Monogerm, self-fertile, genetic male-sterile plants from population 1566 were used as the recurrent parent to produce C859. About 75% of population 1566 is composed of germplasm from curly top virus resistant C562 (2) and C563 (3) type sources and 25% from fusarium stalk blight [*Fusarium oxysporum* Schlechtend.:Fr. f. sp. *betae* (Steward) W.C. Snyder & H.N. Hans.] resistant C566 (1). About 8% of C859 is from a multigerm line, the source of the *Rz* factor. After three backcrosses and reselections for resistance to rhizomania, the population was increased by harvesting seed from the monogerm, genetic male-sterile segregates. In addition to segregating for resistance to rhizomania, C859 will have genetic variability for high resistance to curly top virus and bolting. The population will be moderately susceptible to virus yellows (caused by beet yellows and beet western yellows viruses), powdery mildew (caused by *Erysiphe polygoni* DC.), and erwinia root rot [caused by *Erwinia carotovora* (Jones) Bergey et al. subsp. *betavasculorum* Thomsen et al.]. Based on the performance of the population and experimental population hybrids in the absence of rhizomania, C859 has good general combining ability for sugar yield and low to intermediate

sucrose concentration. C859 was evaluated as populations 1859, 2859, and 3859.

C859 should be useful as a source for developing potential monogerm, O-type parental lines that combine resistance to rhizomania, curly top, and bolting. It also should be useful as a source for continued population improvement and for combined disease resistance.

Breeder seed is maintained by the USDA-ARS and will be provided to sugarbeet breeders in quantities adequate for reproduction. Written requests should be made to the author.

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Registration of Two Sugarbeet Germplasms Resistant to *Rhizoctonia* Root Rot: FC715 and FC715CMS

Sugarbeet (*Beta vulgaris* L.) germplasms FC715 (Reg. no. GP-148, PI 574625) and FC715CMS (Reg. no. GP-149, PI 574626) were developed by the USDA-ARS in cooperation with the Beet Sugar Development Foundation. They were released in 1992 from seed productions 911026HO and 911026HO1. These germplasms were developed as sources of resistance to root-rotting strains of *Rhizoctonia solani* Kühn.

FC715 is a diploid, monogerm, O-type, pseudo-self-fertile sugarbeet germplasm resistant to root and crown rot (caused by *R. solani* AG-2-2 anastomosis group). It is genetically heterogeneous, relatively vigorous, easy bolting, and moderately tolerant to cercospora leaf spot (caused by *Cercospora beticola* Sacc.), with low to medium resistance to the curly top virus. It segregates for green hypocotyl (21%). It is the O-type (maintainer line) of its CMS equivalent, FC715CMS, which is the BC₇ with FC504CMS/FC502-2//662119-s1/3/FC708 (1) as the nonrecurrent parent. The original population consisted of ≈ 60 individuals. FC715 consists of S₀ individuals developed via four cycles of mass selection for rhizoctonia root rot resistance. The original source population of FC715 (300 mother roots) had gene contributions of 16% from FC504 (3), 16% from FC502-2 (3), 16% from 662119-s1, and 52% from FC708.

In our 1993 field evaluation for resistance to *R. solani* in a replicated, inoculated field experiment at Fort Collins, CO (2), FC715 and FC715CMS were not significantly different from each other or from the resistant check but were significantly better than the susceptible check ($\alpha = 0.05$). FC715 and FC715CMS had mean disease indices (DI) of 1.3 and 1.0, compared with 1.3 and 3.0 for the resistant (FC705-1) and

susceptible checks, respectively (DI of 0 = no root rot and 7 = all plants dead). Percentages of healthy plants (those rated 0 or 1) were 67, 84, 71, and 24% for FC715, FC715CMS, resistant check, and susceptible check, respectively. The 1993 epiphytotic was moderate in severity. From past experience, we would expect even greater differentiation between the resistant germplasms and the susceptible check under a more severe epiphytotic. General combining ability (GCA) of FC715 was not tested; however, because it is heterogeneous, it should have potential for GCA improvement. FC715 is proposed for use as a diverse O-type population from which to select O-type monogerm parents for use in commercial three-way resistant hybrids. Breeder seed of FC715 and its CMS equivalent is maintained by the USDA-ARS and will be provided in quantities sufficient for reproduction upon written request to the corresponding author. We ask that appropriate recognition be made of the source when this germplasm contributes to the development of a new cultivar.

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