REGISTRATION OF C31-43 AND C31-89 BEET YELLOWS VIRUS-RESISTANT GERMPLASM OF SUGARBEET

C31-43 and C31-89 are sugarbeet (Beta vulgaris L.) germplasm lines (Reg. no. GP-138 and GP-139, PI 560135 and PI 560136) 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. They were released in 1991. C31-43 and C31-89 are sister lines descended from half-sib families from germplasm C31/6, an advanced reselection for performance and disease resistance from C31 (1). They are multigerm, self-sterile, and segregate for hypocotyl color. In field tests, both lines had good to moderate resistance to virus yellows caused by beet yellows virus (BYV) and beet western yellows virus (BWYV), erwinia root rot caused by Erwinia carotovora (Jones) Bergey et al. subsp. betavasculorum Thomson et al., and to bolting. They were moderately susceptible to curly top virus (CTV) and intermediate in reaction to powdery mildew caused by Erysiphe polygoni DC. In field tests, the lines gave high sugar yield, moderate sucrose concentration, and low soil tare, and the beets extended above the soil. These lines outyielded most commercial hybrids under BYV-infected conditions. As pollinators in experimental hybrid combinations, they showed good general combining ability for sugar yield. These hybrids were usually the best in the test for sugar yield under conditions where less resistant varieties were heavily infected with virus yellows. The hybrids showed midparent values for percent loss due to virus yellows.

C31-43 and C31-89 differed slightly for performance traits and reaction to prevalent diseases. Usually, C31-43 showed higher sucrose concentration but lower root yield and less resistance to powdery mildew, downy mildew (caused by Peronospora farinosa (Fr.:Fr.) Fr. f. sp. betae Byford), and to bolting than did C31-89. Percent loss data from field tests suggested that these lines have the highest level of resistance against BYV yet achieved. They were superior as lines per se and as parental components in hybrid formation. Their superior performance was most pronounced under BYV and virus yellows infected conditions. These germplasms should be useful as advanced base populations for extracting disease resistant parental lines and possibly as parental lines themselves where combined sugar yield productivity and resistance to BYV, BWYV, erwinia root rot, powdery and downy mildew, and bolting are desired.

Breeder seed is maintained by USDA-ARS and will be provided to sugarbeet breeders in quantities adequate for reproduction. Written requests should be made to J. Hu, Dep. of Vegetable Crops, Univ. of CA 95616; and J.N. Rutger, USDA-ARS, P.O. Box 38776. Registration by CSSA. Accepted 29 Feb. 1992. Corresponding author.

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