REGISTRATION OF C46 SUGARBEET PARENTAL LINE

C46 Sugarbeet (Beta vulgaris L.) (Reg. no. PL-24) was developed by USDA-ARS, in cooperation with the Beet Sugar Development Foundation and the California Beet Growers Association. C46 was jointly released in 1982.

C46 is a diploid (2x = 18), self-sterile, multigerm line derived from the backcross of the F1 (C17 × C64) to C17 (1). It segregates for red and green hypocotyl color. The line is moderately vigorous, has good pollen production, and flowers synchronously with bolting-resistant, seed bearing parents under commercial hybrid seed production conditions. The foliage type is somewhat variable with a shiny green canopy. Sufficient genetic variability should exist to make possible continued improvement for most traits.

C46 was increased from the fourth successive cycle of phenotypic recurrent selection for various combinations of factors. The selection criteria in each cycle were based upon individual plant performance for sucrose concentration, root yield and conformation, and freedom from disease. After 5-11 months of growth, roots were selected from spaced plantings under natural or inoculated exposure to prevalent diseases. In each cycle of selection, 28 to 70 plants participated in seed production, representing a selection intensity of approximately 3 to 5%. In all cycles, selections were made for resistance to sugarbeet Erwinia (E. carotovora betavasculorum) soft root rot under wound-inoculated conditions. In cycles two through four, seedling plants were inoculated with mixed strains of beet western yellow virus. Moderate to severe exposure to Erysiphe polygoni D. C. type (= E. betae Weltz), incitant of powdery mildew, occurred each year, and the least severely mildewed plants were selected. The third cycle of selection was made from a November planting; only nonbolted beets were included in the selections made the following fall.

C46 combines or improves the favorable attributes of both C17 and C64. It is moderately resistant to virus yellows, powdery mildew, and Erwinia. It has shown a very low incidence of infection by Peronospora farinosa Fr., the incitant of downy mildew. Its nonbolting tendency, it can be used to produce hybrids to fall and winter plantings. As a line per se or in combination with C17 for root yield and sucrose concentration, it has good general combining ability for sucrose. Over 4 years, hybrids involving C46 have produced higher root and gross sucrose yield and higher percentage points higher sucrose concentration than hybrids produced with widely used C36 (2) and the commercial hybrid ‘US H11’. Hybrids may continue to be tested. Semicommercial quantities of hybrid seed have been produced, and at least one proprietary hybrid with this pollinator has been approved for production areas of California.

Breeder seed is maintained by USDA-ARS and provided to sugarbeet breeders in quantities adequate for reproduction. It is asked that appropriate recognition be made of the source when this parental line contributes to the development of a new cultivar or hybrid. Written requests for seed should be made to Sugarbeet Res. Unit, USDA-ARS, U. S. Agric. Res. Stn., P. O. Box 5098, Salinas, CA 93915.

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References and Notes