

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, DC

and

BEET SUGAR DEVELOPMENT FOUNDATION
DENVER, COLORADO

NOTICE OF RELEASE OF CN12-446, CN12-770, and CN72-652 SUGARBEET

The Agricultural Research Service of the United States Department of Agriculture and the Beet Sugar Development Foundation announce the joint release of sugarbeet germplasm lines CN12-446, CN12-770, and CN72-652. These lines were developed in the breeding program of K.L. Richardson and R.T. Lewellen, Crop Improvement and Protection Research Unit, USDA-ARS, Salinas, California. This germplasm represents ongoing efforts to combine multiple disease resistance with high productivity and to enhance source populations.

CN12-446 (PI 657939), CN12-770 (PI 657940), and CN72-652 (PI 657938) are multigerm (MM), green hypocotyl (rr), self-fertile (Sf), partially inbred lines extracted from genetic-male-sterile (A-: aa) facilitated, random-mated lines. CN12-446 and CN12-770 are sister S2 lines and are more than 75% identical. Each is sugarbeet cyst nematode (*Heterodera schachtii* Schmidt) resistant, powdery mildew (PmPm) (*Erysiphe betae*) resistant, and contains the Rz1 gene for resistance to Beet necrotic yellow vein virus (rhizomania). CN12-446 and CN12-770 are bolting resistant. CN12-770 was selected for higher percent sucrose from a set of selfed progeny lines. CN72-652 is sugarbeet cyst nematode resistant. It does not contain the Rz1 gene and is susceptible to powdery mildew. CN72-652 is moderately bolting resistant.

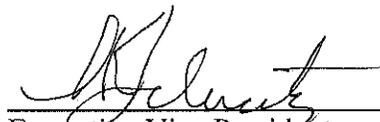
N112 (CN12, PI 636338) is the progenitor population of CN12-446 and CN12-770. N112 is a progeny population from crosses of wild beet (WB) (*Beta vulgaris* subsp. *maritima*) including WB 97 (PI 546394) and WB 242 (PI 546413) and sugarbeet (*B. vulgaris* subsp. *vulgaris*) C54 (PI 590802) and 0747 (PI 590762). The advanced 0747 x C54 population was released as C931 (PI 636340). The pedigree is described in more detail in the release and registration of population CN12. Individual plants from N112 were selfed and one progeny line, N212-204, was selected based on field trials for powdery mildew, rhizomania, sugarbeet cyst nematode, and curly top resistance. Individual plants from N212-204 were selfed and two lines were selected: N412-204-446 and N412-204-449, which gave rise to CN12-446 and CN12-770, respectively. N412-204-446 was selfed giving rise to six progeny lines. All six sister lines showed similar sugarbeet cyst nematode resistance levels over two years of field trials and eight roots each were composited and increased to give rise to N612-446. Mother roots of N612-446 were selected for powdery mildew resistance and named N712-446. N712-446 was increased and named N812-446. N812-446 is being released as CN12-446. N412-204-449 was selfed and one progeny line, N512-204-449-770, was selected. N512-204-449-770 was increased and named N712-770. N712-770 is being released as CN12-770. CN12-446 and CN12-770 are similar but unique from most other sugarbeet lines. In the Imperial Valley of California under cyst nematode and powdery mildew

conditions and extended hot weather, they show a “stay-green,” very compact canopy that appears to be less affected by the feeding of *Empoasca*. It is undetermined if this stay-green characteristic is due to resistance to *Empoasca*, genes that give a stay-green condition, or if it is the result of combined resistance to powdery mildew and cyst nematode.

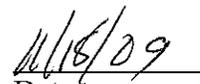
N172 (CN72, PI 636339) is the progenitor population of CN72-652. N172 is a progeny population from crosses of wild beet (*B. vulgaris* subsp. *maritima*) and sugarbeet (*B. vulgaris* subsp. *vulgaris*). It is not known if cyst nematode resistance in N112 is identical to that of N172. The wild beet source of resistance to sugarbeet cyst nematode was a Salinas accession from Europe that had been reported to be tolerant or resistant to sugarbeet cyst nematode. The pedigree is described in detail in the release and registration of population CN72. Individual plants from N172 were selfed and one line, N272-233, was selected based on sugarbeet cyst nematode resistance and freedom from segregation for annuals (B-). N272-233 was increased to give rise to N472-233. Individual plants from N472-233 were selfed and N572-233-652 was selected for cyst nematode resistance and improved plant type. N572-233-652 was increased twice to give rise to N872-652. N872-652 is being released as CN72-652. CN72-652 has a very tall, light green canopy.

Seed of CN12-446, CN12-770, and CN72-652 will be maintained at the USDA-ARS Crop Improvement and Protection Research unit, Salinas, CA and will be provided upon written request to sugarbeet breeders in sufficient quantities for reproduction. Genetic material of these releases has been deposited in the National Plant Germplasm System where it will be available for research purposes, including development and commercialization of new parental lines and cultivars. It is requested that appropriate recognition be made if this germplasm contributes to the development of a new breeding line or cultivar. The National Plant Germplasm System and additional information on prior releases and PI numbers can be found at www.ars-grin.gov/npgs. Requests for seed should be made to Dr. Kelley L. Richardson, USDA-ARS, 1636 East Alisal Street, Salinas, CA 93905, phone: 831-755-2819, fax: 831-755-2814, kelley.richardson@ars.usda.gov.

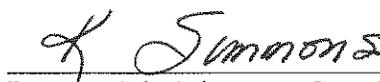
Signatures:



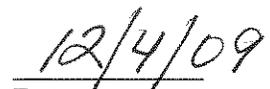
Executive Vice President
Beet Sugar Development Foundation



Date



Deputy Administrator, Crop Production and Protection
Agricultural Research Service, U.S. Department of Agriculture



Date