

## Registration of CO960293-2 Wheat Germplasm Resistant to *Wheat streak mosaic virus* and Russian Wheat Aphid

CO960293-2 (Reg. no. GP-728, PI 615160) winter wheat (*Triticum aestivum* L.) germplasm was developed by the Colorado Agricultural Experiment Station and jointly released by the Colorado and Kansas Agricultural Experiment Stations in January 2001. CO960293-2 was released because of its resistance to both *Wheat streak mosaic virus* (WSMV) and Russian wheat aphid [RWA; *Diuraphis noxia* (Mordvilko)]. CO960293-2 was developed from the cross PI 222668/'TAM 107'//CO850034 completed in 1991. PI 222668 is a RWA-resistant, winter wheat landrace introduction from east Azerbaijan, Iran (Souza et al., 1991). The pedigree of CO850034, an unreleased experimental line from the Colorado State University breeding program, is Novi Sad 14/Novi Sad 603/'Newton'3/'Probrand 835'. Segregating populations of the cross from which CO960293 was derived were advanced in the field to the F<sub>4</sub> generation without deliberate selection by bulking successive generations. CO960293 was derived as an F<sub>4.5</sub> line in 1996 and tested in preliminary yield trials in 1997 and advanced yield trials in 1998. CO960293 was entered in the 1999 Regional Germplasm Observation Nursery (RGON) where it was observed to carry a high level of resistance to WSMV in field tests at Hays, KS. Twenty-five randomly chosen heads were selected from CO960293 in 1998 and grown in the field as headrows in 1999. Selection CO960293-2 (an F<sub>7.9</sub> line) was homogenous and homozygous for RWA resistance in standard greenhouse screening tests and WSMV resistance in field tests in 2000.

Field tests were conducted at Hays, KS, in 2000 to characterize the WSMV resistance in CO960293. Grain yield data from replicated ( $n = 4$  observations) paired plots (e.g., WSMV-inoculated and control) indicated that WSMV resistance in CO960293 (4050 kg ha<sup>-1</sup> control vs. 4178 kg ha<sup>-1</sup> inoculated) is similar to that of the resistant check KS96HW10-3 (4057 kg ha<sup>-1</sup> control vs. 4077 kg ha<sup>-1</sup> inoculated) and greater than WSMV resistance in the susceptible checks 'Trego' (4252 kg ha<sup>-1</sup> control vs. 3290 kg ha<sup>-1</sup> inoculated) and 'Karl 92' (3492 kg ha<sup>-1</sup> control vs. 2611 kg ha<sup>-1</sup> inoculated). Greenhouse RWA resistance evaluations, based on a 1 = very resistant to 5 = very susceptible rating scale, showed that RWA resistance in CO960293-2 (rating = 2) is similar to the resistant check 'Halt' (rating = 2) and greater than the susceptible checks 'Carson' (rating = 5) and 'TAM 107' (rating = 4). Inheritance of RWA resistance in CO960293-2 is not yet known, although RWA resistance in its donor parent PI 222668 was previously determined to be conditioned by either a single dominant or a single dominant and a single recessive gene (Dong et al., 1997).

CO960293-2 is an awned, white-glumed, medium-late maturity, semidwarf winter wheat. Heading date of CO960293-2 is approximately 5 d later than TAM 107 while its plant height is equivalent to TAM 107. While replicated field performance data for CO960293-2 are not available, CO960293 was evaluated in the 1999 Colorado Lower Moisture Variety Trial (LMVT). Data from five replicated dryland locations ( $n = 15$  observations) indicated that CO960293 is yield competitive with commercially available cultivars (TAM 107, 3843 kg ha<sup>-1</sup>; 'Akron', 3957 kg ha<sup>-1</sup>; CO960293, 3984 kg ha<sup>-1</sup>) but has lower grain volume weight (TAM 107, 730 kg m<sup>-3</sup>; Akron, 735 kg m<sup>-3</sup>; CO960293, 686 kg m<sup>-3</sup>).

Greenhouse and growth chamber experiments with the parents of CO960293-2 have failed to identify the original source of the WSMV resistance. Observations of symptom development following mechanical WSMV inoculation in growth chamber experiments indicate that the WSMV resistance in CO960293-2 is temperature-sensitive, similar to the *Wsm1* gene found in Citr 17884, a wheat/*Agropyron intermedium* (Host) P. Beauv. translocation line (Seifers et al., 1995). Chromosome C-banding experiments failed to identify alien chromatin in CO960293 and preliminary data from allelism tests with CO960293 and Citr 17884 indicate independent segregation of the two sources of WSMV resistance.

Small quantities of seed (3 g) for research purposes may be obtained from the corresponding author for at least 5 yr from the date of this publication. Appropriate recognition of the source should be given if this germplasm contributes to the development of improved cultivars or germplasm.

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