REGISTRATION OF DT367 HIGH-YIELDING DURUM WHEAT GERMPLASM

DT367 SPRING DURUM WHEAT, Triticum turgidum L. var. durum Desf. (Reg. no. GP-328, PI 546060), was developed at the Agriculture Canada Research Station at Swift Current, SK, as part of the South Saskatchewan Wheat Breeding Program. DT367 was released in 1982 because of its potential value as high-yielding germplasm.

DT367 was derived from an F6 plant selected from a three-way cross made in 1972 between S-017, a semidwarf introduction from CIMMYT selected on the basis of high yield at Swift Current; ‘Wascana’ (1), and 7168, a selection from an F1 diallel introduced from the University of Manitoba. Its parentage is S-017/Wascana/7168. It was developed by a modified pedigree method in which leaf and stem rust resistant plants were selected in the F2. Testing and selecting were done in the F4, F6, and F8 generations under the designation 7262-8A3 for grain yield, rust resistance, and pasta quality. The F3, F5, and F7 generations were grown in a winter nursery in Brawley, CA, or Ciudad Obregón, Mexico. It was tested in the Canadian Durum Wheat Cooperative test as DT367 from 1979 to 1981, inclusively.

In 15 location-yr of testing in the Aridic Haploboroll and Mesic Boroll soil zones of Saskatchewan and Alberta, the grain yield of DT367 was 113% of Wascana, the highest yielding check cultivar. In the Udic Boroll soil zone of Manitoba and Saskatchewan, the yield of DT367 was 114% of Wascana in 14 location-yr of testing. DT367 is similar in days to maturity, is ~6 cm shorter, and has lodging resistance slightly superior to that of Wascana. The test weight of DT367 is slightly lower than those of the check cultivars, Wascana and ‘Hercules’.

The spikes of DT367 have glabrous, white glumes. Awns are long, white, and spreading at maturity. The kernels are large in size, weighing (on average) 2.5 mg more than Wascana, the largest-seeded cultivar. The straw of DT367 has hollow internodes, little or no anthocyanin coloration, and is of medium thickness. In physiological studies, DT367 showed greater efficiency of use of N and P in production of harvest biomass than ‘Wakooma’. DT367 had higher grain yield potential and lower grain protein concentration than Wakooma.

DT367 is resistant to the prevalent races of leaf and stem rust (caused by Puccinia recondita Roberge. ex Desmaz. and P. graminis Pers.: Pers., respectively) and bunt (caused by Tilletia laevis Kühn in Rabenh., and T. caries (DC.) Tul. & C. Tul.). It is moderately susceptible to loose smut [caused by Ustilago tritici (Pers.) Rostr.] and tan spot [caused by Pyrenophora tritici-repentis (Died.) Dreschs.,] and moderately resistant to kernel smudge and common root rot [caused primarily by Cochliobolus sativus (Ito & Kuribayashi) Dreschs. ex Dastur] to septoria leaf spot (caused by Septoria spp.).

In three years in the Cooperative Durum Wheat Test, DT367 was rated not equal in quality to Hercules, the statutory standard. It was 1.7% lower in protein content than Hercules but had the highest grain yield potential and lower grain protein concentration than Wascana, the check cultivar. In the Udic Boroll soil zone of Manitoba, DT367 showed greater efficiency of use of N and P in production of harvest biomass than ‘Wakooma’. DT367 was released in 1982 because of its potential value as high-yielding germplasm.

References and Notes

3. O.G. Merkle, J.A. Webster, K.J. Starks, and E.L. Smith (5)


REGISTRATION OF YELLOW SUGARCANE APHID–TOLERANT WHEAT GERMPLASM

‘YSCA’-1 (Reg. no. GP-327, PI 510665) is a spring durum wheat (Triticum durum Desf. (Reg. no. GP-328, PI 546060), was developed at the USDA-ARS and the Oklahoma Agricultural Experiment Station. It was specifically developed for tolerance to the yellow sugarcane aphid, Sipha flavaa (Forbes) (YSCA). This pest, which apparently injects a salivary toxin into the plant during feeding, has been known to infest durum wheat, especially in Texas and Oklahoma. Greenhouse evaluation of a group of lines revealed that one line from Pakistan, Wheeltendre Sevice Strain no. 2001, of T. tauschii (Coss.) Desf., appeared to be the most tolerant, and further testing showed that the tolerance of this line to YSCA was inherited by a single dominant gene (2). YSCA-1 is a composite of 17 homozygous tolerant BC1F2 plants from the cross ‘Chinese Spring’ (CL 6223)/‘Chinese Spring’. In 1981, Chinese Spring, as the female, was crossed with WIS 2001 using standard wheat crossing procedures. The F1 plants were male sterile, so the florets were pollinated with Chinese Spring pollen to facilitate cross-pollination. Homozygous F2 lines from fertile plants were selected for increase in the greenhouse. Thirty-five seeds from each homozygous F2 line were tested in the F3 generation to confirm tolerance, using procedures similar to those used for evaluating resistance to the greenbug, Schizaphis graminum (Rondani), in wheat.

YSCA-1 is similar to Chinese Spring in height, maturity, general phenotype. The germplasm is evaluated for reaction to other pests, or for fertility in crosses with wheat.

YSCA-1 (PI 510665) has been deposited in the USDA-ARS National Small Grain Collection, Kings, Idaho 83210. Small quantities of seed are available from the curator of the seed repository.

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