Registration of TS1, TS10 and TS41, Three High Production Tetraploid Triticale Germplasm Lines

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TS1 (Reg. No. GP-18, PI-643454), TS10 (Reg. No. GP-19, PI-643455), and TS41 (Reg. No. GP-20, PI-643456) are tetraploid triticales (×Triticosecale Wittm.) developed and released by the Institute for Sustainable Agriculture (CSIC) in Córdoba, Spain, for use in research and crop improvement programs. Tetraploid triticales were first achieved by Krolow (1973), crossing hexaploid triticale with diploid rye (Secale cereale L.) followed by selfing the F1 hybrid. Amphiploids between Aegilops tauschi Coss. and rye have been obtained from callus induced on immature inflorescences of the hybrid between A. tauschi and S. cereale L. (Fedak, 1984), by colchicine treatment of the hybrid (Bernard and Bernard, 1987) and crossing the tetraploid plants for each parent (Kawakubo and Taira, 1992).

TS1, TS10, and TS41 are three tetraploid triticale germplasm lines with high non-grain biomass production. TS1 was derived from the cross T6/Huescar as reported by Cabrera et al. (1996), T6 being an autotetraploid A. tauschi (2n = 4x = 28, DDDD) originally from the former Plant Breeding Institute (Cambridge, UK). Huescar is a spontaneous autotetraploid S. cereale collected at the Huescar hills, Spain (2n = 2x = 28, RRRR). TS10 and TS41 were obtained by chromosome doubling of the hybrid using colchicine treatment. They were derived from the crosses T4/Centeio do Alto and Sando 208/Grand Crouelle, respectively. T4 and Sando 208 (Clae 51) are diploid A. tauschi lines (2n = 2x = 14, DD). T4 was developed by Gordon Kimber. Centeio do Alto (PI 321643) and Grand Crouelle (PI 235536) are diploid rye accessions (2n = 2x = 14, RR).

Somatic chromosome counts revealed that the plants had the expected chromosome number of 28. The difference in chromosome size between the two parental species made the plants true amphiploids. For somatic chromosome counting, root tips were treated for 4 h with a 0.05% colchicine solution, fixed in 3:1 ethanol–acetic acid, and stored in conventional Feulgen technique.

These lines did not show susceptibility to known diseases of the area, including stripe rust [caused by Puccinia striiformis West. (syn. P. glumarum Eriks & Hen.] and stem rust (caused by P. graminis Pers.: Pers. f. sp. Eriks. & E. Marchal (syn. E. graminis Eriks & E. Marchal]).

TS1, TS10, and TS41 are characterized by their high non-grain biomass production. In 2 yr of Guadalquivir River Valley trials (37° 85´N, −4° 85´W) with three replications, tetraploid triticale lines TS1, TS10, and TS41 were compared with the conventional Feulgen technique.

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