REGISTRATION OF MONTANA-4 ANNUAL HEXAPLOID × AGROTRITICUM GERMPLASM

MONTANA-4 (MT-4) (Reg. no. GP-296) annual hexaploid × Agrotriticum sp. was released as germplasm in April 1988, by the Montana Agricultural Experiment Station for breeding and experimental purposes. It bears the NSSL Serial no. 230633 and the PI no. 518859.

MT-4 annual Agrotriticum was derived from an amphiploid of a cross of Triticum turgidum L. var. durum (2n = 28) × Agropyron intermedium (Host) Beauv. (2n = 42) by backcrossing to T. turgidum var. durum and by selfing. The amphiploid was developed by W.J. Sando (6) and registered as germplasm (4). T. turgidum var. durum (Wells, CI 13333) served as the male parent in our backcrosses (BC,F). The material was sired for six generations after the backcrossing (BC,F,BC,F). Selfing resulted in the elimination of some Agropyron univalent chromosomes and in others becoming bivalents. Chromosome pairing relationships of the backcross and the different selfing generations were previously reported (3, 5). The number of chromosome pairs increased from an average of 10.4 in the BC,F, to 18.5 in the BC,F, generation. Stabilization of chromosome pairing was improved as expressed in the range of bivalents (0-21 in the BC,F, and 16-21 in the BC,F, generation). Univalents decreased from an average of 17.0 in the BC,F, to 3.5 in the BC,F,. An annual hexaploid Agrotriticum with the constitution AABBII resulted. The II complements consist of a group of 2 to 7 chromosome pairs from A. intermedium. Further meiotic stabilization can be accomplished by continued selfing and selection for plants with 7 A. intermedium chromsome pairs as demonstrated by Schulz-Schaeffer and Haller (5).

Spikelet size, awn, rachis, anther length, and leaf width of the annual hexaploid Agrotriticum (BC,F,) are intermediate between the amphiploid Agrotriticum and T. turgidum var. durum parents. Average plant height of the BC,F, was 150 cm as compared to 'Ward' durum wheat (PI 15892), which was 89 cm in 1987. Seed size of the BC,F, progeny varied from 1.7-3.3 mg as compared to 'Ward' durum wheat (PI 15892), which was 89 cm in 1987. Seed size of the BC,F, was 24.4 mg and is smaller (24.4 mg) than that of the durum progenitor (46.9 mg). The seeds were intermediate in size and shape and were of a drought resistant grass and the possibility of transferring this characteristic into wheat has not yet been explored.

Small seed samples of MT-4 are available upon request and agreement to recognize appropriately the source of this germplasm when it contributes to the development of a new cultivar. Seed can be requested from Jurgen R. Schaeffer, Department of Plant and Soil Science, Montana State University, Bozeman, MT 59717.

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References and Notes

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REGISTRATION OF 16 LINES OF SOFT WHITE SPRING WHEAT GERMPLASM

The isolines of spring wheat (Triticum aestivum L.) (Reg. no. GP-297 to GP-312, P1518613 to P1518628 listed in Table 1 were selected from the backcross population 'Manfred' 6/*Norin 10'/Brever'14/Marfed. This germplasm was developed cooperatively by the USDA-ARS and the Washington State University, Pullman, WA, and jointly released in 1988. These lines were developed for the purpose of transferring the Rht and Rht, semidwarf genes of Norin 10/Brever 14 (C113253), both singly and in combination into Manfred (C11919). Manfred is a soft white spring wheat cultivar that was distributed to farmers in 1946 and was grown in the northwestern USA until 1979 (9). Manfred is a midseason, midall-nonsemidwarf, with awnless spikes and white-short-soft-ovate kernels. It has been described in detail by Bayles and Clark (8).

Development of these soft white spring wheat isolines is part of a program to establish genetic stocks of this type for each of the major wheat market classes produced in the northwestern USA. Similar lines have been developed and registered for the hard white winter, hard red winter, and soft white winter club cultivars (5, 6, 7).

Table 1 lists the 16 Manfred genetic background isolines representing four culm length genotypes. They were developed from 1962 to 1980. The BC1, BC3, and BC5 crosses were accomplished by mating 4 to 14 F1 plants as males to Manfred of the primary, BC2, and BC4 populations. The BC2, BC4, and BC6 crosses were made by mating 13 F1 plants of BC1, 20 F1 plants of BC3, and 57 F1 plants of BC5 as males to Manfred.

In 1980, 118 F2-derived F1 lines representing the four culm length genotypes were selected on the basis of apparent plant height uniformity and phenotypic similarity to Manfred. Selected lines among the final backcross comprise four culm length genotypes: two-gene short semidwarf (Rht1Rht2 Rht3 Rht5); one gene medium semidwarf (Rht1Rht2Rht3Rht5 Rht6); and standard height (Rht1Rht2Rht3Rht5). In the Manfred genetic background the Rht1Rht2Rht3Rht5 geno- type gives a culm length about 49% of the standard height genotype. The Rht1Rht2Rht3Rht5 and Rht1Rht2Rht3Rht5 geno- types have nearly similar culm length phenotypes that are about 81% of the standard height level.

Genotypes of the one-gene semidwarf isolines were identified by crossing them to testers of Rht1(C113438) and Rht2 ('Nugaines') and observing segregation for culm length among the F2 plant populations of test crosses in 1984. Lines classified as two-gene-semidwarfs have similar culm lengths to Norin

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