REGISTRATION OF PENNLNE 40 WINTER OAT GERMPLASM

PENNLINE 40 (Reg. no. GP-55, PI 555726) a winter oat (Avena sativa L.) germplasm, was released by the USDA-ARS and the Pennsylvania Agricultural Experiment Station in November 1991. The purpose of the release is to provide breeders with a source of superior winterhardiness. Development of oat cultivars with improved winterhardiness has depended on the detection and utilization of transgressive segregation for that trait. Therefore, new transgressive genotypes are useful as parents for combining elite winterhardiness with other agronomic traits to develop winter oat cultivars. Based on performance in national tests, Pennline 40 has a level of winterhardiness which is a major improvement for that trait.

Pennline 40 was previously evaluated as PA 8115-40. The pedigree of Pennline 40 is PA 822-7538*3/C38447. PA 822-7538 was selected from the cross ‘Milford’/‘Wintok’ Selection/‘Hairy Culberson’/‘Nyle’/Wintok Selection/Hairy Culberson, and C38447 is a semi dwarf mutant line selected at North Carolina State University from the cross of ‘Carolee’/’Fulgrain’.

Pennline 40 was selected from a composite population constituted by bulking seed of 115 F2 populations from the last cycle of backcrossing. These populations were grown in 1973 at the Eastern Virginia Research Station near Warrsaw, VA, and the composite was grown under natural selection near University Park, PA, from 1974 to 1978. Surviving plants were harvested in bulk each year and random seed samples were used to sow plots in succeeding years.

In 1979, 324 plants from the composite were grown, hardened, and frozen using a crown freezing technique (Marshall and Kolb, 1982); 43 surviving plant crowns were transplanted in the greenhouse. Seeds harvested from these F0 plants were grown in single-row observation plots in 1981 at Warsaw, VA. Thirteen lines were saved for further evaluation; all but Pennline 40 were discarded in 1985 because of undesirable characteristics.

Pennline 40 was tested in the Uniform Winterhardiness Nursery (UWHN), as PA8115-40 in 1986, 1990, and 1991. In 1986, Pennline 40 exceeded the winterhardiness of Wintok, ‘Walken’, ‘Norline’, and ‘Pennwin’, the most winterhardy winter oat cultivars; it exceeded the winterhardiness of Wintok by the largest margin in the history of the UWHN. The average hardiness of Pennline 40 over the 3-yr period was significantly (P = 0.05) greater than that of Wintok and Norline (Walken and Pennwin were not included in the 1990 and 1991 UWHN).

PA 822-7538 is the more winterhardy parent of Pennline 40, and the two genotypes can be indirectly compared by examining their performance in the UWHN relative to Wintok. In the period 1971–1973, the difference in winterhardiness between PA 822-7538 and Wintok was 134% of Wintok (significant at P = 0.05), compared with 105% for PA822-7538.

Pennline 40 is similar to Pennwin and Norline for plant height, is earlier in maturity, and has a long, slender, off-white kernel.

Seed (<5 g) of Pennline 40 is available for research and breeding purposes. Written requests should be made to D.P. Livingston, USDA-ARS Oat Research, Pasture Research Laboratory, Curtin Rd., University Park, PA 16802. Seed will be maintained by the Oat Research project at University Park, PA.

D. P. LIVINGSTON,* H. G. MARSHALL, AND F. L. KOLB (2)

REGISTRATION OF BS27 MAIZE GERMPLASM

BS27 is a MAIZE (Zea mays L.) population (Reg. no. GP-236, PI 558498) developed by the cooperative maize breeding research projects conducted by the Iowa Agriculture and Home Economics Experiment Station and the USDA-ARS. BS27 is a strain of Antigua Composite selected for adaptation to temperature areas. Breeder seed of BS27 is maintained by the Iowa Agriculture and Home Economics Experiment Station, and the distribution of 500-seed samples of BS27 is by the Committee for Agriculture Development, 23 Curtiss Hall, Iowa State University, Ames, IA 50011. Date of release was 20 Mar. 1992.

Samples of 500 seeds of Antigua Grupo 1 and of Antigua Grupo 2 were provided by Mario Gutierrez G. of the International Maize and Wheat Improvement Center (CIMMYT) in 1975 from seed produced at Tlaltizapán, Morelos, Mexico, in 1965. Antigua collections are considered to be long to the race Tusón (1). Each lot of 500 seeds was planted in the 1975 maize breeding nursery near Ames, IA, for seed increase by hand pollination. In 1976, 1000 seed of Antigua Grupo 1 and Antigua Grupo 2 were bulked to form a 2000-seed composite. The 2000-seed composite was planted in isolation in 1976 and allowed to interpollinate by open pollination. Pollinated ears were harvested, and after drying, equal quantities (~100) of seed of each ear were bulked to form Antigua Composite. Two bulks were formed, with one put in cold storage for reserve and the second to be used in a selection study.

Mass selection for adaptation of the Antigua Composite for temperature conditions of the U.S. Corn Belt was initiated in 1977. Mass selection emphasized the date when individual plants had silks visible. Plots were planted in fields isolated (at least 220 m) from other maize fields near Ames, IA. The protocol used in mass selection was the same for each cycle of selection. Approximately 20 000 seeds were sown in the isolated field. The field was ex-