

REGISTRATION OF 'TRAILBLAZER' SWITCHGRASS

'TRAILBLAZER' switchgrass (*Panicum virgatum* L.) (Reg. no. CV-146, PI 549094) was developed by the USDA-ARS and the Nebraska Agricultural Research Division, Department of Agronomy, University of Nebraska, and released in 1984 for use as a warm-season pasture grass in the Central Great Plains and adjacent midwestern states.

Trailblazer is the result of a genetic study designed to determine if forage quality of switchgrass could be improved by restricted phenotypic selection and to obtain heritability estimates for in vitro dry matter digestibility (IVDMD) (4). The base populations for this study were two Nebraska experimental strains: ey and ff. These strains were developed by Dr. L.C. Newell, research agronomist, USDA-ARS, from collections made in 1953 from natural grasslands in Nebraska and Kansas. Both strains are similar to 'Pathfinder' (2) in maturity, origin, and breeding history. A selection nursery of >2 200 plants was established in 1973 with transplanted seedlings of the two experimental strains. Approximately 800 plants that seemed to be agronomically superior were sampled in 1974 for IVDMD. Single-plant selections for high and low IVDMD were made in each of the nursery rows. In 1976, ramets from 25 of the high-IVDMD selections and from 25 of the low-IVDMD selections were transplanted to establish isolated high- and low-IVDMD polycross (PC) nurseries. Syn-1 seed harvested from these nurseries in 1977 and from the same open-pollinated (OP) clones in the selection nursery in 1976 was used in 1978 to establish a replicated, seeded sward nursery in which the following strains were compared: high-IVDMD PC (Trailblazer), high-IVDMD OP, Pathfinder, low-IVDMD OP, and low-IVDMD PC. In the 3-yr period 1978 through 1980, strains averaged 506, 483, 477, 476 and 467 g kg⁻¹ IVDMD, respectively (3,4). Strains did not differ significantly for forage yield in any of the 3 yr; thus, the genetic gain in IVDMD was achieved without forage yield loss.

Feeding and grazing trials were then conducted to determine what effect the change in IVDMD had on animal performance. Hays of Trailblazer, Pathfinder, and low-IVDMD PC were fed to sheep (*Ovis aries*) in a trial in which in vivo dry matter digestibility, dry matter intake, and fiber digestibility were determined. There were no significant differences among strains for these traits although Trailblazer was higher in in vivo dry matter digestibility and fiber digestibility than the low-IVDMD PC strain (3). Trailblazer and low-IVDMD PC strains were increased to the Syn-2 generation and the Syn-2 seed of these strains and certified seed of Pathfinder were used to establish a replicated ($r = 4$) grazing trial at Mead, NE in 1981 (1). The 0.4-ha pastures were grazed for 69, 62, and 47 d in 1982, 1983, and 1985,

respectively, with beef (*Bos taurus*) yearlings. The stocking rate was three animals per pasture in 1982 and 1983 and four per pasture in 1985 (1). In 1984, pastures were used in a diet selection (esophageal) trial (5). Heifers were used in 1982 and steers in 1983 and 1985. Average daily gains per animal for the three year grazing period were 0.73, 0.59, and 0.64 kg for Trailblazer, Pathfinder, and low-IVDMD PC, respectively (1). Average weight gains per hectare were 352, 284, and 299 kg, respectively, for the same three strains. The 6% improvement in IVDMD of Trailblazer in comparison to Pathfinder resulted in a 23% improvement in beef production per hectare. This large improvement in animal performance was the primary reason for the release of Trailblazer. Prior to the release of Trailblazer, Pathfinder was one of the most widely grown switchgrasses in the central Great Plains.

Trailblazer is a 25-clone synthetic that is similar to Pathfinder in maturity, appearance, and area of adaptation which is primarily the central Great Plains and the western Corn Belt. In comparison to Pathfinder, its primary distinguishing characteristic is its higher IVDMD. Twelve of the 25 clones are from the Nebraska strain ff, while the remainder are from the ey strain. Trailblazer is a hexaploid ($2n = 6x = 54$). Seed propagation of Trailblazer is restricted to two generations of increase from breeder seed, one each of foundation and certified. Breeder seed (Syn-2) and foundation seed are maintained by the Department of Agronomy, Nebraska Agricultural Research Division, Lincoln, NE 68583.

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References and Notes

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