Registration of Parental Lines

REGISTRATION OF TWO INBRED LINES OF BUCKWHEAT
(Reg. Nos. PL 1 and PL 2)

H. G. Marshall

Two buckwheat (Fagopyrum esculentum Moench) inbred lines, Pennline 18 (PaI18, CI 52) and Pennline 25 (PaI25, CI 53), were developed and released by The Pennsylvania Agric. Exp. Stn. and AR-SEA-USDA. Both lines are direct increases from respective individual S6 plants from the cross 'LaHarpe' × PaI4 made in 1965. PaI4 is a sister line of 'Pennline 10' which was released in 1970 (2) and LaHarpe is a French cultivar. Inbreeding was done in the greenhouse using 12 plants per line per generation with selection for high self-fertility.

Buckwheat normally is self-incompatible and seed production is dependent on cross-pollination between “pin” (long pistil, short stamen) and “thrum” (short pistil, long stamen) flowers. Pennline 18 (PL 1) and Pennline 25 (PL 2), however, are homomorphic for an atypical flower form (anthers and stigmas essentially on the same level) which I have previously described (1). Their average stylar lengths are both about 0.96 mm compared to an average of 2.2 mm for the “pin” type flowers in heteromorphic strains. Self-fertility results from the reduced stylar length.

Both lines are uniform for morphological traits and the plants are substantially shorter than those of either parent or of open-pollinated strains. Flower color is white. Pennline 18 has medium size, dark brown, angular seeds. Pennline 25 seeds are similar except that they are uniform gray in color.

Pennline 18 and Pennline 25 were released for plant breeding purposes only. They may serve as parents in research programs to develop systems for the utilization of hybrid buckwheat. Although both lines are self-fertile, over 90% of the Pennline 18 and 75% of the Pennline 25 progeny were hybrids (3) when grown under open-pollination in alternate rows with a heteromorphic strain in 1973. This adaptability for hybrid production is a major desirable attribute of the two new inbred lines. In contrast, self-fertilization is so effective in the earlier release, Pennline 10, that few hybrid progeny result from cross pollination.

The Pennsylvania Agric. Exp. Stn. will maintain breeders seed. A packet of 20 seeds will be sent to plant breeders who request it from the Dep. of Agronomy, Tyson Building, The Pennsylvania State University, University Park, PA 16802.

REFERENCES


REGISTRATION OF PEARL MILLET INBREDS
TIFF 23DBE, TIFF 23DAE AND TIFF 756
(PL 9 to PL 11)

Glenn W. Burton

TIFF 23DBE pearl millet (Pennisetum americanum) was developed by repeatedly backcrossing TIFF 23DB with the male-sterile, e1, gene (2). Thus, it combines the earliness and photoperiod insensitivity imparted by the e1 gene with the many desirable characteristics of TIFF 23DBE (1). TIFF 23DBE produces uniform, many culm-stemmed plants that reach a height of 0.6 to 1.0 m. The sheaths are pubescent and its stems, nodes, and sheaths have a characteristic purple color when exposed to the sun. The hybrid of TIFF 23DBE is filled with a moderately sweet, juicy pith and its leaves and sheaths remain green longer after seeds mature than most other millets. Seeds are borne in well-exserted heads that range in length. Like other pearl millets, it contains no goitrogens or prussic acid glucosidase.

TIFF 23DBE is self-fertile and gives good seed yields. Planting at growing conditions, TIFF 23DBE will flower in 45 to 50 days after planting date. Planted in May at Tifton, GA, TIFF 23DBE will flower 2 to 3 weeks earlier than TIFF 23DBE. Planted in mid-August in the greenhouse in the winter, it will flower a week to 10 days earlier than TIFF 23DBE.

TIFF 23DAE (PL 10) was developed by substituting TIFF 23DBE for TIFF 23DB as a sterility maintainer for TIFF 23DAE. This hybrid has the same flowering habits as its parents but exhibits considerably increased lodging resistance to its hybrids that characterizes TIFF 23DAE. Crossed with TIFF 23DAE, TIFF 23DBE and TIFF 756 were released 1 Sept. 1980.

TIFF 756 (PL 11) was developed by transferring the A, sterile cytoplasm in TIFF 23DAE into TIFF 23DBE. The e1 gene gives TIFF 756 the short stature and the d, e, e gene into TIFF 23DAE. Crossed with TIFF 23DAE, TIFF 756 is male-sterile F1 hybrid capable of yielding over 4,000 kg/ha of pearl millet. TIFF 756 produces uniform, many culm-stemmed plants that reach a height of 0.6 to 1.0 m. Its leaves and sheaths are pubescent and its stems and sheaths remain green until maturity. TIFF 756 is resistant to lodging and its lodging resistance to its hybrids that characterizes TIFF 23DAE. Breeder seed of these lines will be maintained and distributed by the Georgia Coastal Plain Station, Tifton, GA 31793.