REGISTRATION OF PEARL MILLET INBREDS
TIFT 239DB₂ AND TIFT 239DA₁
(Reg. No. PL 5, PL 6)
Glenn W. Burton and D. S. Athwal²

The inbred lines of pearl millet (Pennisetum typhoides (Burm.) Stapf and C. E. Hubbard) were developed jointly by the Crops Research Division, U. S. Department of Agriculture, Georgia Coastal Plain Experiment Station, Tifton, and Punjab Agricultural University, Ludhiana, India. On April 15, 1968, the lines were released separately by Punjab Agricultural University and jointly by Crops Research Division and Georgia Coastal Plain Experiment Station.

Tfft 239DB₁ (Reg. No. PL 5) (the maintainer) was developed at Tifton, Georgia, by introducing the d₄ₚ dwarf gene pair into Tfft 15 (one of the four inbreds used to produce 'Gahi-1') by a series of three backcrosses, and selfing selected dwarf plants for an additional 10 generations.

Plants of Tfft 239DB₂ have smooth (non-pubescent) foliage and many medium to fine culms that reach a height of 0.8 to 1.3 m when mature. Their gray seed with light brown germ ends are borne in well-exserted heads that range from 12 to 24 cm in length. Tfft 239DB₂ is widely adapted, seeds well, and is highly self-fertile. Plants from early May field plantings and December greenhouse plantings flower at Tifton, Georgia, in about 80 and 60 days, respectively.

Tfft 239DA₁ (Reg. No. PL 6) was developed by crossing the tall, cytoplasmic male-sterile L103A₁ pearl millet line (selected in 1961 at Ludhiana, India, from an African variety) with Tfft 239DB₂ and backcrossing for eight generations the dwarf male-sterile plants from each cross with Tfft 239DB₂. Thus, Tfft 239DA₂ looks like Tfft 239DB₂ and should be essentially the same except for its cytoplasm.

Tfft 239DA₂ carries the same d₄ₚ gene and dwarf character advantages as Tfft 239DA₁ but has a different sterile cytoplasm. The reciprocal relationship between these two cytoplasms and their maintainer lines is unique in that the maintainer for one sterile cytoplasm restores fertility in the other. Thus, F₁ hybrids Tfft 239DA₁ × Tfft 239DB₂ and Tfft 239DA₂ × Tfft 239DB₂ are both fertile.

Many inbreds selected from the world collection of pearl millet will not restore the fertility of male-sterile lines in A₄ cytoplasm. Some of these may be expected to restore the fertility of Tfft 239DA₂. The reciprocal maintainer-restorer relationship between the A₁ and A₄ sterile cytoplasms and their maintainers will facilitate the development of a number of different kinds of populations and breeding systems.

In the United States, breeder seed of these lines will be maintained and distributed by the Georgia Coastal Plain Experiment Station, Tifton, Georgia. In India, breeder seed will be distributed by the Punjab Agricultural University, Ludhiana, India.

REGISTRATION OF SUDANGRASS INBREDS
TAM-GA S-1A and TAM-GA S-1B¹
(Reg. Nos. PL 1 and PL 2)
J. P. Craigmiles⁶

TAM-GA S-1A (Reg. No. PL 1), a dwarf, cytoplasmic male-sterile line of 'Rhodesian' sudangrass (Sorghum arundinaceum (Wild.) Stapf), and TAM-GA S-1B (Reg. No. PL 2), a maintainer line, were released November 1967 jointly by the Texas and Georgia Agricultural Experiment Stations. These releases culminated 10 years of research in developing a dwarf cytoplasmic male-sterile line of sudangrass. The development of this cyto-sterile resulted in the release of the first hybrid sudan6grass.

TAM-GA S-1B, the maintainer, was developed by transferring recessive dwarf genes (aabbcc) from 'Combine Kafir 60' sorghum (Sorghum bicolor (L.) Moench.) B line to the tall (AABBCC) B line of Rhodesian sudangrass. Fertile F₁ plants (AaBbCc) were selfed and the F₂ seed increased. Dwarf (aabbcc) forage-type F₂ plants low in HCN potential were backcrossed to the tall (AABBCC) Rhodesian B line and heterozygous tall (AaBbCc) progenies were selfed. This alternate generation of selfing and backcrossing was continued 4 cycles until a desirable forage-type dwarf Rhodesian B line (approximately 1.2 m tall) was obtained. Self-fertility of inbred TAM-GA S-1B approaches 100 percent and is influenced principally by weather.

TAM-GA S-1A, the cytoplasmic male-sterile line, resulted from the transfer of nuclear factors of Rhodesian sudangrass (Pl 156549) to the sterile cytoplasm of CK 60 sorghum. Thereafter, recessive dwarf genes were transferred to the male-sterile line from TAM-GA S-1B by repeated backcrossing. The height was reduced to about 1.2 m, which is ideal for mechanical seed harvesting.

Each line possesses wide leaves, rather dry stems, and good resistance to most foliar diseases. At maturity, the dark seeds have reddish brown to black glumes, tend to shatter, remain viable in the soil, and volunteer the following summer. The plants cross readily and produce seed prolifically.

The development and release of these parental lines have world-wide implications, because the material facilitates production of adapted sudangrass hybrids in any geographical area where sorghums are grown. A locally adapted sorghum variety with dominant height genes may be used as pollinator to produce tall F₂ hybrids.

Forage production is not significantly different between hybrids containing the tall and dwarf male-steriles as the female parent and the variety Tfft as the common pollinator. In one test, both hybrids produced about 30% more forage than commercial sudangrass varieties.

Small quantities (30 g) of these parental lines can be obtained upon request from the Texas A&M University Agricultural Research and Extension Center, Beaumont, Texas 77705.

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³Superintendent, Texas A&M University Agricultural Research and Extension Center, Beaumont, Texas.

CORRECTIONS
In the November-December 1968 issue, the two figures on page 737 in the article "Inter-genotypic Competition in Soybeans" by Brim and Schutz were inadvertently transposed during printing.

In the article "Genetic Variability in Flue-cured Varieties of Nicotiana tabacum L." by D. F. Matzinger on page 732, the second term in the equation for σₐ² should be \( \frac{\sigma_{F_{\text{PP}}}^2}{\bar{F}} \).