

Registration of 29 Forage Sorghum Genetic Stocks in A3 Cytoplasm

Twenty-nine forage sorghum [*Sorghum bicolor* (L.) Moench] cytoplasmic male-sterile genetic stocks (Reg. no. GS-3 to GS-31, PI 595222 to PI 595250) were jointly developed by the USDA-ARS and the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska, and were released in April 1996. All of the male-sterile lines have A3 cytoplasm originating from IS1112C (SC193) obtained from A3Tx398 (8) or A3Tx430 (9).

The 29 genetic stocks were developed by crossing the recurrent parent to the A3 source followed by a minimum of four backcross generations in the field or greenhouse during the years 1989 to

1995 (Table 1). These genetic stocks closely resemble the recurrent parent and were completely male-sterile at Lincoln and Mead, NE, as determined in the field by covering test panicles with pollinating bags prior to anthesis during all backcross generations. Sterility reactions in other environments have not been confirmed.

These genetic stocks represent a broad range of forage sorghum lines in A3 cytoplasm. They have immediate application for basic research involving forage sorghum with A3 cytoplasm, and immediate application as female lines for producing F₁ hybrids, many of which will be heterotic combinations previously not possible on A1 cytoplasmic male-sterile seed parents. Because of the low incidence of lines that restore fertility to A3 male-sterile plants (9), use of these lines directly or in hybrid combination will usually produce male-sterile plants. In agricultural use, such plants may reduce the threat of producing male fertile seed from out-

Table 1. Genetic stock designations, recurrent parent and cytoplasm sources, and phenotypic characteristics of 29 forage sorghum A3 cytoplasm genetic stocks and original recurrent parents grown at Lincoln, NE, in 1994.

Genetic stock (BC ₄)†	Reg. no.	PI no.	Recurrent parent	Cytoplasm source	Days to anthesis		Height	
					A3 stock	Recurrent parent	A3 stock	Recurrent parent
					d		cm	
A3N149	GS-3	PI 595222	Rox Orange	A3Tx398†	71	70	285	290
A3N150	GS-4	PI 595223	Brawley‡	A3Tx398	75	76	295	300
A3N151	GS-5	PI 595224	Dale‡	A3Tx398	86	85	320	315
A3N152	GS-6	PI 595225	Kansas Collier	A3Tx398	74	76	275	265
A3N153	GS-7	PI 595226	Wray‡	A3Tx398	78	78	315	320
A3N154	GS-8	PI 595227	Sugar Drip‡	A3Tx398	83	82	221	220
A3N155	GS-9	PI 595228	Waconia-L	A3Tx398	71	69	285	280
A3N156	GS-10	PI 595229	N98‡ (short selection)	A3Tx398	70	68	165	165
A3N157	GS-11	PI 595230	N98 (tall selection)	A3Tx398	73	71	260	265
A3N158	GS-12	PI 595231	N99‡	A3Tx398	61	63	245	250
A3N159	GS-13	PI 595232	N100‡	A3Tx398	75	76	285	290
A3N160	GS-14	PI 595233	EL-ES	A3Tx398	70	68	280	275
A3N161	GS-15	PI 595234	Ellis‡	A3Tx398	73	72	285	285
A3N162	GS-16	PI 595235	Fremont	A3Tx398	58	59	235	235
A3N163	GS-17	PI 595236	Atlas‡	A3Tx398	75	75	320	315
A3N164	GS-18	PI 595237	Early Hegari-Sart	A3Tx398	62	62	190	195
A3N165	GS-19	PI 595238	Red X	A3Tx398	70	71	305	305
A3N166	GS-20	PI 595239	Blue Ribbon	A3Tx398	73	74	335	340
A3N167	GS-21	PI 595240	Colman‡	A3Tx398	77	77	310	310
A3N168	GS-22	PI 595241	Hastings	A3Tx398	76	75	320	320
A3N169	GS-23	PI 595242	E-35-1	A3Tx430‡	93	91	220	220
A3N170†	GS-24	PI 595243	IS2729	A3Tx430	77	77	165	160
A3N171	GS-25	PI 595244	KS5‡	A3Tx398	61	61	145	140
A3N172	GS-26	PI 595245	N108‡	A3Tx398	73	71	200	200
A3N173	GS-27	PI 595246	N109‡	A3Tx398	73	71	160	160
A3N174	GS-28	PI 595247	N110‡	A3Tx398	73	72	295	295
A3N175	GS-29	PI 595248	N111‡	A3Tx398	74	73	305	305
A3N176§	GS-30	PI 595249	Early Sumac‡	A3Tx398	68	68	205	205
A3N177§	GS-31	PI 595250	Black Spanish Broomcorn	A3Tx398	72	72	305	320

† Backcross generation: all are BC₄, except A3N170, which is BC₅.

‡ Registered varieties or parental lines. Corresponding citation reference number is given in parenthesis: Dale (1); Wray (2); N98, N99, N100, N108, N109, N110, N111 (3); Ellis (4); Brawley (5); Atlas, Coleman, Early Sumac, Sugar Drip (6); KS5 (7); A3Tx398 (8); A3Tx430 (9).

§ Grown at Lincoln, NE, in 1995.

crossing with weedy sorghum, and may have superior forage quality.

Since selection may have occurred within the recurrent parent inbred lines during multiple generations of maintenance at Lincoln, seed of the recurrent parent used by this project will be distributed with the genetic stocks to maximize similarity of nuclear genes in each set of lines in the various cytoplasms.

Seed of these genetic stocks will be maintained and distributed by the USDA-ARS Wheat, Sorghum, and Forage Research Unit, Dep. of Agronomy, Univ. of Nebraska, Lincoln, NE 68583-0937, and will be provided without cost to each applicant upon written request. Seed has also been deposited in the National Seed Storage Laboratory. It is requested that appropriate recognition be made of the original source of the recurrent lines, and of this project as the source of these genetic stocks, if this germplasm contributes to the development of a new breeding line or cultivar.

J. F. PEDERSEN* AND J. J. TOY (10)

References and Notes

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