Reprinted from *Crop Science*
Vol. 37, No. 4

Registration of 43 Sorghum Genetic Stocks in A2, A3, and A4 Cytoplasm

Forty-three sorghum [*Sorghum bicolor* (L.) Moench] cytoplasmic male-sterile genetic stocks (Reg. no. GS-53 to GS-95, PI 595272 to PI 595314) 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. These lines have A2, A3, or A4 cytoplasm originating from IS12662C (SC171), IS1112C (SC193), and IS7920C (SC299), respectively, and obtained from the sources shown in Table 1.

The 43 genetic stocks were developed by crossing the recurrent parent to the cytoplasm source followed by a minimum of four backcross generations in the field or greenhouse during the years 1987 to 1995 (Table 1). These genetic stocks closely resemble the recurrent parent and were completely male-sterile in 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 significantly broaden the existing range of commonly used inbred lines in alternate cytoplasms. They have immediate application for basic research involving alternate cytoplasms of sorghum. They also may be utilized as females in crosses to test for hybrid vigor with maintainer lines of other cytoplasmic–nuclear male-sterility systems, as suggested by Schertz et al. (14).

Since selection may have occurred within the recurrent parent inbred lines during multiple generations of maintenance at Lincoln, seed of the recurrent parent (and, where appropriate, the A1 cytoplasmic male-sterile) 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, University of Nebraska, Lincoln, NE 68583-0937, and will be provided without cost to each applicant on 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,* J. J. TOY, AND B. E. JOHNSON (17)

References and Notes

1. Andrews, D.J., B.E. Johnson, and W.M. Ross. 1990. Registration of N122, a pair of A/B grain sorghum parental lines. Crop Sci. 30:1379.
2. Atkins, R.E. 1983. Registration of 12 sorghum parental lines. Crop Sci 23:1229.
3. Atkins, R.E. 1984. Registration of 11 sorghum A- and B-line inbreds. Crop Sci. 24:1227.

4. Gorz, H.J., F.A. Haskins, and B.E. Johnson. 1990. Registration of 15 germplasm lines of grain sorghum and sweet sorghum. Crop Sci. 30: 762–763.
5. Johnson, J.W., D.T. Rosenow, G.L. Teetes, and J.M. Phillips. 1982. Registration of 19 greenbug resistant sorghum germplasm lines. Crop Sci. 22:1272.
6. Karper, R.E. 1954. Registration of sorghum varieties VII. Agron. J. 46:526–527.
7. McCall, M.A., H.B. Brown, J.A. Clark, E.F. Gaines, H.K. Hayes, W.J. Morse et al. 1936. Agronomic affairs, minutes of the twenty-ninth annual meeting of the society: Varietal standardization and registration. J. Am. Soc. Agron. 28:1027–1028.
8. Miller, F.R. 1984. Registration of RTx432 sorghum. Crop Sci 24:392.
9. Miller, F.R. 1986. Registration of RTx435 sorghum parental line. Crop Sci 26:215.
10. Miller, F.R. 1986. Registration of seven sorghum A- and B-line inbreds. Crop Sci. 26:216-217.
11. Nordquist, P.T., and J.E. Partridge. 1988. Registration of sorghum germplasm lines selected for improved stalk strength. Crop Sci. 28:203–204.
12. Peterson, G.C., J.W. Johnson, G.L. Teetes, D.T. Rosenow. 1985. Registration of midge resistant sorghum germplasm. Crop Sci 25:372.
13. Schertz, K.F. 1984. Registration of A3Tx398 and B3Tx398 male sterile and maintainer germplasm lines of sorghum. Crop Sci. 24:883.
14. Schertz, K.F., L.E. Clark, and D.T. Rosenow. 1990. Registration of A3Tx430 and A3Tx7000 sorghum genetic stocks. Crop Sci. 30:1163.
15. Ross, W.M., H.J. Gorz, F.A. Haskins, and O.J. Webster. 1980. Registration of ten sorghum parental lines. Crop Sci. 20:834.
16. Wiebel, D.E., J.B. Sieglinger, and F.F. Davies. 1984. Registration of fourteen sorghum parental lines. Crop Sci 24:628.
17. J.F. Pedersen and J.J. Toy, USDA-ARS and Dep. of Agronomy, Univ. of Nebraska-Lincoln, Lincoln, NE 68583-0937; B.E. Johnson, Dep. of Agronomy, Univ. of Nebraska-Lincoln, Lincoln, NE 68583-0915. Joint contribution of the USDA-ARS and the Dep. of Agronomy, Univ. of Nebraska-Lincoln, as Journal Series Paper no. 11536. Registration by CSSA. Accepted 30 Nov. 1996. *Corresponding author (agro137@unlvm.unl.edu).

Published in Crop Sci. 37:1412–1414 (1997).

Table 1. Genetic stock designations, recurrent parent and cytoplasm sources, backcross generation, and phenotypic characteristics of 43 grain sorghum lines in A2, A3, or A4 cytoplasm and the original recurrent parents grown at Mead, NE, in 1995.

Genetic stock	Reg. no.	PI no.	Recurrent parent	Cytoplasm source	Backcross generation	Days to anthesis	Height
						d	cm
—			BN122†	—	—	78	80
A2N178	GS-53	PI 595272	BN122	A2Tx398	BC_6	78	80
A3N179	GS-54	PI 595273	BN122	A3Tx398†	BC_6	78	80
A4N180	GS-55	PI 595274	BN122	A4Tx398	BC_6	77	85
—			BKS57	—	—	74	60
A2N181	GS-56	PI 595275	BKS57	A2Tx398	BC_7	74	65
A3N182	GS-57	PI 595276	BKS57	A3Tx430†	BC_7	73	65
A4N183	GS-58	PI 595277	BKS57	A4Tx398	BC_7	75	65
—			Tx3042	—	—	66	95
A2N184	GS-59	PI 595278	Tx3042	A2Tx398	BC_7	68	90
A3N185	GS-60	PI 595279	Tx3042	A3Tx430	BC_7	68	90
A4N186	GS-61	PI 595280	Tx3042	A4Tx398	BC_7	68	90
—			Wheatland†	—	—	80	85
A2N187	GS-62	PI 595281	Wheatland	A2Tx398	BC_7	79	85
A3N188	GS-63	PI 595282	Wheatland	A3Tx430	BC_7	81	85
A4N189	GS-64	PI 595283	Wheatland	A4Tx398	BC_7	79	80
—			BN38†	—	—	83	80
A2N190	GS-65	PI 595284	BN38	A2Tx398	BC_7	81	75
A3N191	GS-66	PI 595285	BN38	A3Tx430	BC_7	82	75
—			BTx623	—	—	77	105
A2N192	GS-67	PI 595286	BTx623	A2Tx398	BC_7	76	95
A3N193	GS-68	PI 595287	BTx623	A3Tx430	BC_7	77	95
—			BN37	—	—	80	100
A3N194	GS-69	PI 595288	BN37	A3Tx430	BC_7	79	100
—			BN101†	—	—	71	70
A3N195	GS-70	PI 595289	BN101	A3Tx398	BC_6	71	85
—			BN102†	—	—	71	80
A3N196	GS-71	PI 595290	BN102	A3Tx398	BC_6	71	75
—			BN103†	—	—	75	100
A3N197	GS-72	PI 595291	BN103	A3Tx398	BC_6	76	95
—			Redlan†	—	—	82	100
A3N198	GS-73	PI 595292	Redlan	A3Tx398	BC_7	82	100
—			BTx631†	—	—	81	100
A3N199	GS-74	PI 595293	BTx631	A3Tx430	BC_7	81	105
—			Tx2752†	—	—	85	85
A3N200	GS-75	PI 595294	Tx2752	A3Tx430	BC_7	85	85

Table 1 continues on next page.

Table 1. Genetic stock designations ... and phenotypic characteristics of 43 grain sorghum lines.... *(continued)*

Genetic stock	Reg. no.	PI no.	Recurrent parent	Cytoplasm source	Backcross generation	Days to anthesis	Height
						d	cm
—			N55†	—	—	67	80
A3N201	GS-76	PI 595295	N55	A3Tx398	BC_5	65	75
—			N58†	—	—	67	70
A3N202	GS-77	PI 595296	N58	A3Tx398	BC_5	67	70
—			N64†	—	—	64	70
A3N203	GS-78	PI 595297	N64	A3Tx398	BC_5	66	70
—			N68	—	—	67	70
A3N204	GS-79	PI 595298	N68	A3Tx398	BC_5	67	65
—			N70	—	—	66	85
A3N205	GS-80	PI 595299	N70	A3Tx398	BC_5	66	80
—			N71	—	—	63	70
A3N206	GS-81	PI 595300	N71	A3Tx398	BC_5	65	70
—			N72	—	—	67	65
A3N207	GS-82	PI 595301	N72	A3Tx398	BC_5	67	75
—			N97†	—	—	72	95
A3N208	GS-83	PI 595302	N97	A3Tx398	BC_6	72	100
—			IA28†	—	—	92	90
A3N209	GS-84	PI 595303	IA28	A3Tx398	BC_8	92	90
—			ROKY10†	—	—	91	90
A3N210	GS-85	PI 595304	ROKY10	A3Tx398	BC_7	91	90
—			ROKY11†	—	—	88	90
A3N211	GS-86	PI 595305	ROKY11	A3Tx398	BC_6	89	90
—			SC110-9‡	—	—	80	95
A2N212	GS-87	PI 595306	SC110-9	IA29†	BC_7	80	90
A3N213	GS-88	PI 595307	SC110-9	A3Tx398	BC_7	81	95
—			RTx415	—	—	71	70
A3N214	GS-89	PI 595308	RTx415	A3Tx430	BC_7	72	65
—			RTx432†	—	—	79	100
A3N215	GS-90	PI 595309	RTx432	A3Tx430	BC_7	79	100
—			RTx435†	—	—	79	105
A2N216	GS-91	PI 595310	RTx435	IA29	BC_8	81	95
A3N217	GS-92	PI 595311	RTx435	A3Tx398	BC_8	81	95
—			Tx2536	—	—	82	85
A3N218	GS-93	PI 595312	Tx2536	A3Tx430	BC_7	80	90
—			Tx2737†	—	—	79	100
A3N219	GS-94	PI 595313	Tx2737	A3Tx398	BC_8	78	95
—			Tx2808†§	—	—	77	105
A2N220	GS-95	PI 595314	Tx2808	IA29	BC_4	78	100

† Registered varieties, parental lines, or germplasms (with corresponding reference number shown in parenthesis): N122 (1); IA28 (2); IA29 (3); N97, N101, N102, N103 (4); Tx2737, Tx2752 (5); Redlan (6); Wheatland (7); RTx432 (8); Tx435 (9); Tx631 (10); N55, N58, N64 (11); Tx2808 (12); A3Tx398 (13); A3Tx430 (14); N38 (15); ROKY10, ROKY11 (16).

‡ SC110-9 is a sister selection of TAM428.

§ Grown at Lincoln, NE, in 1995.