

By means of infector row technique, these four germplasm were screened for resistance to rust and LLS under field conditions for 2 rainy seasons (June–July to October–November) at ICRISAT. They were evaluated on a 1-to-9 scale, where 1 = no disease and 9 = 81 to 100% foliage damaged, 1 wk before harvest. The average resistant disease score ranged from 3.0 to 4.0 for rust and 3.0 to 5.5 for LLS as compared with 9.0 on the susceptible control TMV 2. ICGV# 99001 and 99004 for LLS and ICGV# 99003 and 99005 for rust recorded the lowest score in both seasons. These lines were also evaluated for components of resistance to LLS and rust under greenhouse conditions. Resistance to LLS in ICGV# 99001 and 99004 is due to longer incubation (9.5–10.0 d as compared with 8 d in TMV 2) and longer latent (16–26 d as compared with 13 d in TMV 2) periods, reduced number of lesions per leaflet (83–116 as compared with 244 in TMV 2 at 20 d after inoculation (DAI)), smaller lesion diameter (2.5–2.8 mm as compared with 6.6 mm in TMV 2 at 35 DAI), reduced sporulation score (1.8–2.7 as compared with 8.0 in TMV 2 at 35 DAI), and lower leaf area damage (6.4–7.4% as compared with 39.0% in TMV 2 at 20 DAI). Resistance to rust in ICGV# 99003 and 99005 is due to longer incubation (10.7–13.0 d as compared with 7.0 d in TMV 2) and longer latent (14–25 d as compared with 9 d in TMV 2 when first pustule sporulated) periods, reduced number of pustules per leaflet (52–110 pustules as compared with 310 in TMV 2 at 50 DAI), smaller pustule diameter (0.6 mm as compared to 1.0 mm in TMV 2 at 50 DAI), reduced sporulation score (1.7–1.9 as compared with 9.0 in TMV 2 at 50 DAI), and lower leaf area damage (1.4–3.0% as compared with 59.5% in TMV 2 at 50 DAI).

The Genetic Resources and Enhancement Program, ICRISAT Center, Patancheru AP 502324, India, will maintain seeds of these elite germplasm. Limited quantities of seed without limitations on research uses will be made available upon request. The seeds of these germplasm are also deposited with U.S. National Seed Storage Laboratory, 1111 S. Manson, St. Fort Collins, CO 80521-4500.

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Registration of RN582 Sorghum Germplasm Line

RN582 sorghum [*Sorghum bicolor* (L.) Moench] germplasm line (Reg. no. GP-591, PI 628277) was developed jointly by the USDA-ARS and the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska, and was released in September 2001.

RN582 is an S_6 selection from the cross (RTx430 $ms_3ms_3 \times E 35-1$) $\times E 35-1$. RTx430 was developed and released by the Texas Agricultural Experiment Station (Miller, 1984) and was provided to this project containing the nuclear male sterility gene ms_3 by A.B. Maunder in 1988. E 35-1 is an Ethiopian land race with white seed, tan necrotic plant color, 2-dwarf in height, late maturing, and was obtained from A. Sotomayor-Rios in 1979. RN582 has tan necrotic plant color (pp —), white pericarp (— yy), thin mesocarp (ZZ), normal ($WxWx$) white endosperm, no testa (b_1b_1 —), and juicy culms (dd). RN582 has demonstrated high heterotic potential for grain yield with 10% higher yields when crossed to AWheatland than the check hybrid AWheatland \times RTx430 over the 3-yr period 1998 to 2000, and 20% higher yields when crossed to ATx631 than the white seed tan plant check hybrid ATx631 \times RTx437 in 2001 (Table 1). RN582 is adapted to the northern portion of the U.S. grain sorghum producing region and will reach anthesis 5 d earlier than RTx430 in that environment. RN582 is a strong restorer of fertility in A1 cytoplasm. Fertility reaction in other cytoplasmic sterility systems is not known. Nuclear male sterility has not been observed in RN582. Performance data for RN582 and its hybrids collected in 1998, 1999, 2000, and 2001 at Ithaca, NE, are presented in Table 1.

RN582 is a source of tan necrotic plant color and white

Table 1. Descriptive data for RN582, AWheatland \times RN582 and ATx631 \times RN582 hybrids.

	Days to anthesis†	Height	Seed set‡	Test weight	Yield
Inbreds§		cm	%	kg hL⁻¹	kg ha⁻¹
RN582	82	96	100	63	6020
RTx430	87	133	90	50	4076
BWheatland (BTx399)	71	104	80	59	5581
LSD 0.05	3	13	21	21	1693
Hybrids 1998–2000¶					
AWheatland \times RN582	76	165	99	77	10 849
AWheatland \times RTx430	74	139	84	76	9845
LSD 0.05	1	4	11	4	627
Hybrids 2001# (tan plant white seed)					
ATx631 \times RN582	77	150	100	56	6707
ATx631 \times RTx437	76	131	100	54	5576
LSD 0.05	1	8	—	6	714

† Days from planting to 50% anthesis.

‡ Percent self seed set under pollinating bag.

§ Data for inbreds are from a randomized complete block design experiment with $n = 22$ and four replications at Ithaca, NE.

¶ Data for hybrids are means pooled over 3 yr from randomized complete block design experiments with four replications at Ithaca, NE, in 1998 ($n = 44$), 1999 ($n = 44$), and 2000 ($n = 39$).

Data for tan plant white seed hybrids are from a randomized complete block design experiment with four replications at Ithaca, NE, in 2001 ($n = 30$).

seed color with demonstrated high heterotic potential that is adapted to the northern portion of the U.S. sorghum production region. It is suited for the production of high quality grain for feed or food.

Seed of RN582 will be maintained and distributed by the USDA-ARS, Wheat, Sorghum, and Forage Research Unit, Department of Agronomy and Horticulture, University of Nebraska, Lincoln, Nebraska 68583-0937, and will be provided without cost to each applicant on written request. Requests from outside the USA must be accompanied by an import permit. Genetic material of this release will be deposited in the National Plant Germplasm System where it will be available for research purposes, including development and commercialization of new variety/cultivar. It is requested that appropriate recognition be made if this germplasm contributes to the development of a new breeding line or variety/cultivar.

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Registration of Tx2912 through Tx2920 Sorghum Germplasm Lines

Nine sorghum [*Sorghum bicolor* (L.) Moench] germplasm lines, designated Tx2912 through Tx2920 (Reg. no. GP-592-

600, PI 629035-629043), were developed and released in 2002 by the Sorghum Improvement Program of the Texas Agricultural Experiment Station at College Station, TX. These lines are 3-dwarf (*dw₁Dw₂dw₃dw₄*) and possess unique combinations of several agronomic, grain quality, and disease resistance traits.

All of these lines were developed by the pedigree method of plant breeding (Table 1). Most of the parents in the pedigrees of these germplasms have been previously released with the following exceptions. SC326-6 is a partially converted version of SC326-14E (IS 3758C) (Rosenow et al., 1997). 77CS4 is an unreleased breeding line that was a selection from the partially converted version of SC120-14E (IS 2816C)(Rosenow et al., 1997). CS3541 is a breeding line with good disease resistance and green leaf retention.

F₂ progeny from these crosses were selected at College Station. Selections in the F₃ to the F₇ generation were made in one or more of the following locations: Corpus Christi or Beeville (B), TX, College Station (C), TX, and Isabela (T), Puerto Rico. In the final generation of selection, 20 individual panicles of each line were self-pollinated and bulked to create the experimental line. Since that time, these lines have been maintained by self-pollination of increase rows. From 1996 to 2000, these lines were included in numerous replicated tests as inbred lines and in testcross hybrids to determine the merits and weaknesses of each line for key agronomic traits.

All of these germplasms are restorers of the A1 cytoplasmic genetic male sterility system. Their reaction in other cytoplasmic genetic male sterility systems (A2 and A3) has not been tested. Seven of the nine germplasms have tan plant color (Table 1). In addition, two of these germplasms have a red pericarp and tan plant color that may prove particularly useful in the development of tan plant hybrids. None of the lines have a pigmented testa. Maturity ranges from 2 d earlier to 7 d later than RTx430 (Miller, 1984), and plant height

Table 1. Designation, epicarp color, plant color, glume color and pedigree of Tx2912 through Tx2920.

Designation	Epicarp color	Plant color	Glume color	Pedigree
Tx2912	Red	Purple	Purple	(SC326-6 × RTx434)
Tx2913	White	Tan	Straw	(Tx2817 × CS3541)-10-2-B1-B1
Tx2914	White	Tan	Straw	(Rio × CS3541)-5-3-B1-B1-B2-B1
Tx2915	Red	Purple	Purple	((SC120-14E × Tx7000) × RTx430) × SC326-6)-B17-B1-B2-B5-B1
Tx2916	Red	Tan	Tan	((C.Shallu × Rio)-3-6-3-5-1 × RTx434)-C3-C5-C2-C1-C1-C2
Tx2917	Red	Tan	Tan	(Tx2894 × RTx433)-B13-B1-B1-B3
Tx2918	White	Tan	Tan to light brown	((SC120-14E × Tx7000) × Tx7000)-10-4-6 × Tx2894)-C1-C2-C1-C1
Tx2919	White	Tan	Tan	((SC120-14E × Tx7000) × Tx7000)-C1-C3-C2-C4-C3-C2
Tx2920	White	Tan	Light brown	(77CS4 × RTx430)-B1-B2-B1-B1-B2

Table 2. General agronomic characteristics of Tx2912 through Tx2920 and standard checks in four Texas environments in 1999. The locations from which data were collected are Weslaco, Corpus Christi, College Station, and Lubbock, TX

Designation	Days to 50% anthesis	Plant height	LD rating†	LPD rating‡	Des. rating§	Anthrachnose rating¶	Head smut infection	Grain mold rating¶
		cm					%	
Tx2912	80	104	1.8	4.0	2.8	1.9	0	3.2
Tx2913	79	121	3.0	4.5	2.4	4.0	0	2.7
Tx2914	76	128	2.4	4.5	2.6	4.5	0	3.1
Tx2915	79	118	1.7	3.5	2.8	1.4	2	2.7
Tx2916	78	115	2.1	3.7	2.7	4.8	7	3.0
Tx2917	72	116	2.5	1.8	2.4	1.6	1	2.9
Tx2918	71	110	3.2	3.3	2.9	2.5	0	3.3
Tx2919	72	121	3.0	3.2	2.4	2.7	0	3.7
Tx2920	72	107	3.2	3.5	2.6	3.0	0	3.8
RTx430 (check)	73	118	3.4	3.8	3.2	3.9	1	4.4
RTx436 (check)	73	119	2.5	4.0	2.3	1.7	0	3.7

† LD rating = Foliar disease rating taken at maturity with the scale of 1 (healthy) to 5 (dead). Diseases common in these evaluation were zonate leaf spot, caused by *Gloeocercospora sorghi* D. Bain & Edgerton ex Deighton, bacterial leaf stripe, caused by *Burkholderia andropogonis* (Smith) Gillis et al., and leaf blight, caused by *Exserohilum turcicum* (Pass.) K.J. Leonard & E.G. Suggs.

‡ LPD rating = Leaf and plant death rating that reflects post flowering drought tolerance with a scale of 1 (no stress, healthy) to 5 (dead). Ratings were under severe drought conditions in Lubbock, Texas.

§ Desirability rating = Visual rating of overall phenotypic appearance with a scale of 1 (excellent) to 5 (poor).

¶ Ratings for grain mold and anthrachnose are on a scale of 1 (excellent resistance) to 5 (complete susceptibility).