Partial results are shown in Table 2. Sorghum midge population density at anthesis was low to moderate with a test mean of 4.2, indicating about 40% grain loss due to sorghum midge damage. The standard resistant check is ATx2755*Tx2882 and the standard susceptible check is ATx2752*RTx430. Grain yield was low, test mean of 1265 kg ha^{-1}, due to the harsh environmental conditions at Corpus Christi. The six lowest grain yield entries, and 8 of the lowest 10, were susceptible hybrids. All produced significantly less grain than the resistant checks and most experimental entries. Results confirm previous observations that with a late planting date and sorghum midge present at anthesis most resistant hybrids will produce significantly more grain than susceptible hybrids. Seed size measured as gram weight per 100 kernels led to the conclusion that seed size of susceptible hybrids was generally smaller than resistant hybrids although the differences were usually not significant.

There is concern that it will not be possible to develop sorghum midge resistant hybrids for use in the United States. The primary constraint to wide-spread use of currently possibly available hybrids is the lower grain yield potential (averaging 10-15%) of resistant than susceptible hybrids in a normal planting. However, for production delayed at planting two weeks or more resistant hybrids will out-yield susceptibly hybrids without insecticide application. With increasing environmental concern regarding pesticide application a reduction in availability of insecticides to control sorghum midge could significantly increase interest in and potential use of resistant hybrids.

Greenbug Resistance

Selections to develop germplasm resistant to biotype I were made. The primary resistance sources are PI550607 and PI550610. Both sources are used in developing R-lines, and PI550610 is used in B-line development. Screening against the greenbug biotypes identified genotypes that express moderate resistance. Biotype resistance is conditioned by different genes and a moderate level of resistance is desired. Crosses to introgress resistance gene(s) into other germplasm were made. New R-lines resistant to biotype E and/or I produced excellent hybrids. The lines represent a range of plant types including tan plant, white pericarp and tan plant, red pericarp. New tan plant, red grain biotype E resistant A-lines were evaluated in hybrid combination. The hybrids expressed excellent grain yield potential, wide adaptation and resistance to several diseases. Based on performance one A-line, 8PR1059, and two restorer lines, 5BRON139 (resistant to biotype E) and LG35 (resistant to biotype E/I/K) were selected for inclusion in the PROFIT hybrid program.

Experimental germplasm has been selected for diversity of plant type, wide adaptation, foliar disease resistance, and increased grain yield potential. This germplasm will be useful as sources of improved traits for other breeding programs, and selected germplasm might have potential as varieties in specific production systems. Thirty entries were evaluated for grain yield potential as varieties in Managua, Nicaragua (partial results in Table 3). Several lines exhibited excellent grain yield

Table 2. Grain Yield and other agronomic traits of selected entries in the midge hybrid test at Corpus Christi, TX, 2002.

Hybrid	Class	Grain Yield	Midge Damage†	100 kernel weight	Plant Height	Panicle Exsertion
		-kg/ha^{-1}-		-g-	-cm-	-cm-
A8PR1011*Tx2767		2388	2.3	1.82	107	0
A0PR11*Tx2880		2383	2.0	1.86	92	1
A0PR13*Tx2882		2333	3.3	1.80	89	2
A9PR2143*Tx2880		2217	2.3	1.63	103	2
A8PR1011*MB108B		2193	3.0	1.60	131	2
A0PR13*Tx2880		1842	2.3	1.78	93	2
A8PR1015*Tx2880		1817	2.7	1.92	119	2
A9PR2147*Tx2882		1807	2.3	1.66	88	1
A8PR1011*9MLT176		1746	4.3	1.65	108	4
A8PR1013*9MLT181		1728	2.0	1.31	103	4
A8PR1011*9MLT181		1667	2.3	1.27	103	5
A8PR1011*Tx2882		1662	2.0	1.57	100	0
A8PR1011*9MLT180		1659	3.0	1.49	105	5
A8PR1011*Tx2880		1654	2.3	1.39	102	4
A9PR2145*Tx2882		1598	2.3	1.80	92	2
A8PR1011*9MLT157		1580	2.3	1.63	101	1
ATx2755*Tx2882	R-Ck	1568	2.7	1.86	88	1
ATx2755*MB108B	R-Ck	1469	5.3	1.73	110	3
ATx2752*RTx430	S-Ck	1393	6.7	2.42	93	0
ATx2755*Tx2880	R-Ck	1254	3.0	1.65	86	4
A1*Tx430	S-Ck	768	7.7	1.94	110	0
A35*Tx430	S-Ck	331	7.7	1.82	105	5
A807*Tx2783	S-Ck	281	9.0	1.56	112	2
MEAN		1265	4.2	1.71	101	2
LSD.05		456	1.1	0.16	9.5	2

† Rated on a scale of 1 = 0-10% damaged kernels, 2 = 11-20% damaged kernels, up to 9 = 91-100% damaged kernels.