Table 1: ***Designation, source and pedigree of tested material***

Designation	Source	*Pedigree*
Gew 22-15	*Local program*	*Geshiesh x W. Ahmed (Gew)*
Gew 3-2	*Local program*	*Geshiesh x W. Ahmed (Gew)*
Edo 16- dwarf	*Local program*	*Eriana x Dorado (Edo)*
Edo 26-18	*Local program*	*Erian x Dorado (Edo)*
Edo 34-23-4	*Local program*	*Eriana x Dorado (Edo)*
Edo 27-3-25	*Local program*	*Eriana x Dorado (Edo)*
Yarwasha	*Commercial*	
Wad Ahmed	*Commercial*	

Feterita Geshiesh and Feterita Eriana are local landraces while Dorado is an introduction from Latin America via Egypt, USDM Project

Table 2 : Rainfall amount (mm) during the testing period averaged over 3 years (2005-2007) at here locations:

Year	**2005**			**2006**			**2007**		
Month/location	**Sk**	**DM**	**OB**	**Sk**	**DM**	**OB**	**Sk**	**DM**	**OB**
May	-	72	-	-	69	-	-	11.5	-
June	29	138.5	20	22.5	103	5	54.5	102.5	10
July	131	221	97	161.5	146	200	170.5	228	243
August	131	272	184	118	192	57	134.5	266	242
Sept.	71	192	72	62	65	65	131.5	123	72
Oct.	-	18.5	-	-	70	-	17	128	-
Nov.	-	-	-	-	-	-	-	8	-
Total	362	914	373	364	645	367	508	867	567

SK; Suki, DM; Damazin and OB; Obeid

Table3: Analysis of variance for mean grain yield (kg/ha) for each environment and combined over locations

. Year	2005			2006			2007			Combined analysis		
Entry/location	**SK**	**DM**	**OB**	**SK**	**DM**	**OB**	**SK**	**DM**	**OB**	**SK**	**DM**	**OB**
1- Gew 22-15	1308 bc	1449 de	727 cd	1846 cd	1343 d	1050 c	1642 bc	1447 d	658 c	1599 (6)	1413 (6)	812 (7)
2- Gew 3-2	1340 b	1788 cd	728 cd	1881 cd	1404 cd	1363 bc	1621 bc	1349 cd	557 c	1614 (5)	1514 (5)	883 (6)
3- Edo 16-dwarf	1845 a	2092 bc	1335 ab	2362 ab	1580 c	2103 a	1847 b	2014 c	1602 ab	2018 (3)	1895 (4)	1680 (3)
4- Edo 26-18	1779 a	2468 ab	1421 a	2221 bc	1977 b	2133 a	2322 a	2162 b	1711 ab	2107 (2)	2202 (3)	1755 (2)
5- Edo 34-23-4	1990 a	2281 ab	1448 a	2722 a	2170 b	1908 a	2307 a	2403 b	1989 b	2340 (1)	2285 (2)	1780 (1)

6- Edo 27-3-25	1081 ed	1713 cde	1257 ab	1660 de	1224 d	1671 ab	1617 bc	1211 d	1235 b	1453 (7)	1383 (7)	1388 (4)
7-yar washa	904 d	1315 e	1037 bc	1347 e	1177 d	1360 bc	1300 c	1318 d	1214 b	1184 (8)	1270 (8)	1204 (5)
8- W.Ahmed	1138bc d	2642 a	617 d	1689 de	2452 a	1078 c	2647 a	2655 a	634 c	1825 (4)	2583 (1)	776 (8)
Mean	1423	1969	1071	1966	1666	1583	1913	1820	1200	1767 (2)	1818 (1)	1285 (3)
C.V.%	9.51	11.61	18.59	10.6	7.41	18.14	11.23	8.54	22.07	14.87	7.50	12.39
Sing.	**	**	**	**	**	**	**	**	**	**	**	**
SE ±	78.12	131.93	114.95	120.40	71.28	114.95	124.02	89.78	157.32	151.77	78.72	97.92

*; ** P = 0.01 and SK =Suki, DM= Damazin and OB=Obied

Means having letter within the same column are not significantly different according to DMRT. Entry rank is bracketed

Table4: Summary of level of superiority of best lines compared to the checks across rainfed environments

ENT NO.	No env	Level of entry superiority							Rank
Edo 34-23-4	9	5a	1ab	3b	0bc(d)	0c	0de	0e	1
Edo 26-18	9	4a	2ab	2b	1bc(d)	0c	0de	0e	2
Edo 16-dwarf	9	2a	3ab	1b	1bc(d)	2c	0de	0e	3
W.Ahmed	9	4a	0ab	0b	1bc(d)	2c	2de	0e	4
Edo 27-3-25	9	0a	2ab	1b	1bc(d)	1c	3de	1e	5
Gew 3-2	9	0a	0ab	1b	2bc(d)	6c	0de	0e	6
Gew 22-15	9	0a	0ab	0b	2bc(d)	4c	3de	0e	7
Yarwasha	9	0a	0ab	1b	2bc(d)	1c	3de	2e	8

Table 5: Mean squares from combined analysis of variance for grain yield measured in three locations over three years.

Source of variation	df	Ms	*SE*±
Years (Y)	*2*	*1153265.7 ** *	*24.69*
Location (L)	*2*	*6244225.9 ** *	*24.69*
Y x L	*4*	*1622784.6 ** *	*42.77*
R (LY)	*18*	*113841.6*	*74.08*
Genotypes (G)	*7*	*3479862.1 ** *	*40.32*
Y x G	*14*	*109049.9 ** *	*69.84*
L x G	*14*	*822733.6 ** *	*69.84*
Y x L x G	*28*	*115050.2 * *	*120.98*
Error	*126*	*43909.7*	

Table6: Mean grain yield of each genotype and its regression b_i (slope) on means of grain yield at each site.

Variety	Mean(t/ha)	b_i	S^2d_i	R^2
1-Gew 22-15	1.274	1.328	31.857	37
2-Gew 3-2	1.337	1.359	24.410	48
3-Edo 16-dwarf	1.864	0.522	10.977	78
4-Edo 26-18	2.022	0.809	0.684	90
5-Edo 34-23-4	2.135	0.939	0.033	95
6-Edo 27-3-25	1.403	0.038	1.745	99
7-Yarwasha	1.219	0.078	1.696	99
8-W. Ahmed	1.728	2.927	166.548	79

Slope - b_i slopes of regressions of variety means on site index

S^2d_i- Deviations from regression component of interaction

R^2 – Squared correlation between residual from the main effects model and the site index

Table7: Simple correlation coefficient between mean grain yield (kg / ha) of three superior sorghum genotypes with two commercial checks and rainfall across nine environments:

Genotypes	***Correlation (r^2)***
Edo16-dwarf	0.19
Edo 26-18	0.56 *
Edo 34-23-4	0.43
Yarwasha 4	0.41
W.Ahmed	0.73 **

*, ** siginificant at (P = 0.05 and 0.01). Respectively

Table8: Mean grain yield (kg/ha) of verification plots at different sites under rain during 2005 and 2007

Entry	**Sennar (475 mm)**	**Dwaim (358 mm)**	**N. Gedarif Butana (230 mm)**	***Managil 2007, (382 mm)***
1-Edo 34-23-4	*1134*	*450*	*NA*	*NA*
2-Edo 26-18	*1550*	*653*	*1761* (544)***	*NA*
3-Edo 16-dwarf	*1725*	*564*	*NA*	*396*
4-Arfagadamac	*927*	*413*	*NA*	*90*

* chisel + terrace treatment.

** control (flat planting).

Table9: Physiochemical analysis of sorghum grains.

Samples	Moisture (%)	Protein (%)	Fat acidity (mg. KOH/100 g)	Titerable acidity (mg NaOH/100 g)	Hardness (kg)
Gew 3-2	7.78[a]	13.25 [b]	17.35 [a]	0.285 x 10^{-4} [a]	5.548 [a]
Wad Ahmed	7.23 [e]	10.74 [e]	7.36 [d]	0.187 x 10^{-4} [c]	2.460 [c]
Edo 26-18	7.37 [d]	9.42 [h]	12.96 [b]	0.220 x 10^{-4} [b]	3.404 [bc]
Gew 22-15	7.20 [e]	12.86 [c]	18.21 [a]	0.220 x 10^{-4} [b]	3.112 [bc]
Yarwasha	7.18 [e]	14.57 [a]	18.21 [a]	0.220 x 10^{-4} [b]	2.380 [c]
Edo 27-3-25	7.68 [b]	10.31 [f]	18.28 [a]	0.220 x 10^{-4} [b]	3.748 [b]
Edo 34-23-4	7.533 [c]	11.13 [d]	10.81 [c]	0.220 x 10^{-4} [b]	2.536 [e]
Edo-16	7.017 [f]	10.26 [g]	12.90 [b]	0.2200 x 10^{-4} [b]	3.832 [b]
				0.1600 x 10^{-4} [d]	

Mean having different subscript letter(s) in each column differ significantly ($P \leq 0.05$).

Appendix

Appendix1. The classification model of varieties and hybrids on the basis of stability parameters

Situation	**Coefficient of regression**	**Deviation from regression**	***description***
a)	*bi = 1.0*	$S^2d_i = 0$	*Stable material*
b)	*bi = 1.0*	$S^2d_i > 0$	*Good response in all environments but inconsistent*
c)	*bi < 1.0*		
d)	*bi < 1.0*	$S^2d_i = 0$	*Better response in unfavorable environment and consistant*
e)	*bi > 1.0*	$S^2d_i > 0$	
f)	*bi > 1.0*	$S^2d_i = 0$	*Better response in unfavorable environments and inconsistent*
		$S^2d_i > 0$	*Better response in favorable environments and consistent*
			Better response in favorable environments but inconsistent

Courtesy of Vartan .G and Ing Luciano Rameriz, 1986. ICRISAT, Mexico