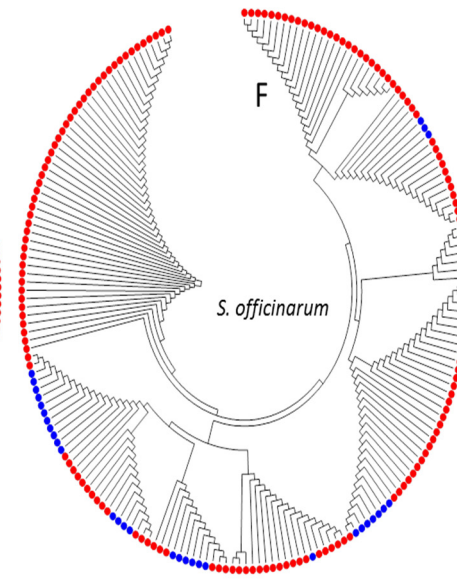
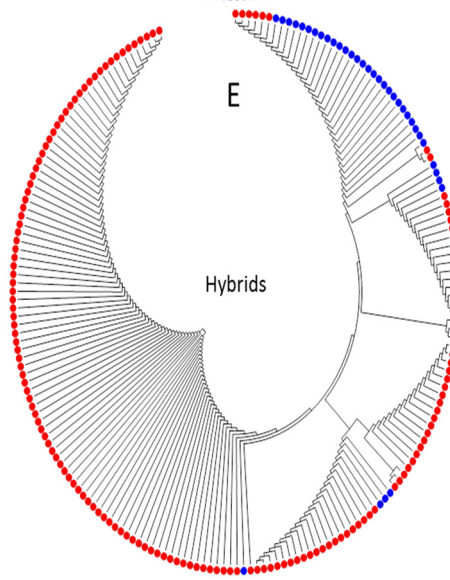
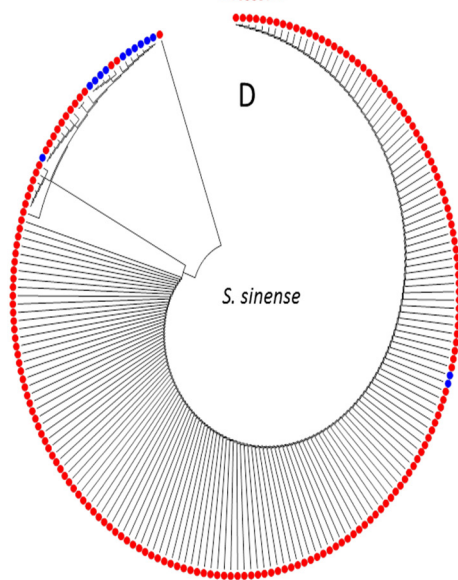
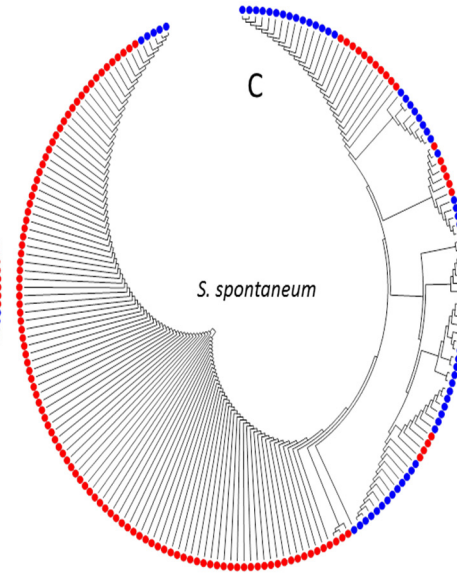
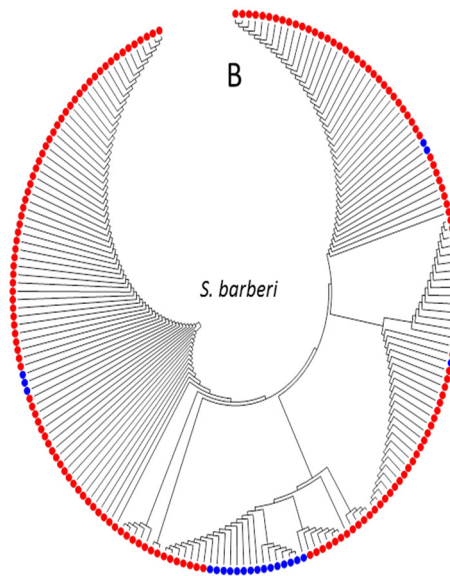
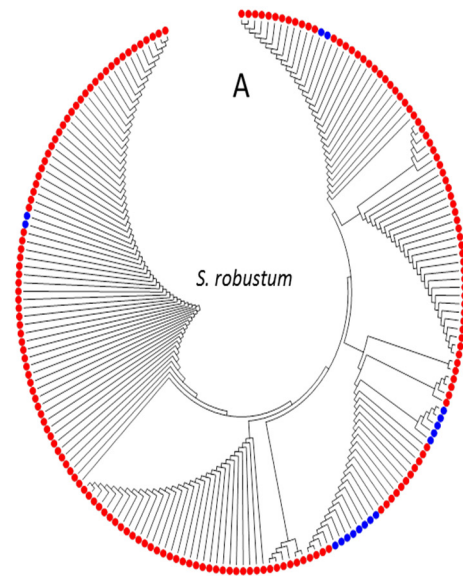


**Supplementary Figure S1.** Distribution of the 624 SSR alleles amplified with 22 pairs of SSR primers from *Saccharum* spp. hybrids and six related *Saccharum* species (*S. spontaneum*, *S. robustum*, *S. officinarum*, *S. sinense*, *S. barberi*, and *S. edule*). The degrees of the distribution were presented by color gradient from red (missing) to green (high).



**Supplementary Figure S2.** Phylogenetic trees for six *Saccharum* species based on species-specific or species-associated SSR alleles: (A) *S. robustum* (5 alleles); (B) *S. barberi* (4 alleles), (C) *S. spontaneum* (4 alleles), (D) *S. sinense* (4 alleles), (E) Hybrids (3 alleles), (F) *S. officinarum* (4 alleles).

**Supplementary Table S1.** The information of 196 sugarcane accessions of *Saccharum* spp. hybrids and six related *Saccharum* species: *S. spontaneum*, *S. robustum*, *S. officinarum*, *S. sinense*, *S. barberi*, and *S. edule*.

ID	Clone_ID	Clone_name	Species	abbr	3-cluster	8-CLUSTER
1	Coimbatore_ssp	Coimbatore	<i>Saccharum spontaneum</i>	ssp	Q1	q7
2	Dacca_ssp	Dacca	<i>Saccharum spontaneum</i>	ssp	Q1	q8(q7)
3	Djatiroto_ssp	Djatiroto	<i>Saccharum spontaneum</i>	ssp	Q1	q7
4	Glagah_ssp	Glagah	<i>Saccharum spontaneum</i>	ssp	Q1	q8
5	Guangxi86-5_ssp	Guangxi86-5	<i>Saccharum spontaneum</i>	ssp	Q1	q7
6	Guangxi87-21_ssp	Guangxi87-21	<i>Saccharum spontaneum</i>	ssp	Q1	q7
7	Guangxi87-22_ssp	Guangxi87-22	<i>Saccharum spontaneum</i>	ssp	Q1	q7
8	IMP9068_ssp	IMP9068	<i>Saccharum spontaneum</i>	ssp	Q1	q7
9	IMP9089_ssp	IMP9089	<i>Saccharum spontaneum</i>	ssp	Q1	q7
10	IN76-086_ssp	IN76-086	<i>Saccharum spontaneum</i>	ssp	Q1	q8
11	IN84-010_ssp	IN84-010	<i>Saccharum spontaneum</i>	ssp	Q1	q7
12	IN84-033_ssp	IN84-033	<i>Saccharum spontaneum</i>	ssp	Q1	q8
13	IN84-089_ssp	IN84-089	<i>Saccharum spontaneum</i>	ssp	Q1	q8
14	IND_81-165_ssp	IND81-165	<i>Saccharum spontaneum</i>	ssp	Q1	q7
15	IND81-043_ssp	IND81-043	<i>Saccharum spontaneum</i>	ssp	Q1	q8
16	IND81-080_ssp	IND81-080	<i>Saccharum spontaneum</i>	ssp	Q1	q7
17	IND81-101_ssp	IND81-101	<i>Saccharum spontaneum</i>	ssp	Q1	q8
18	IND81-142_ssp	IND81-142	<i>Saccharum spontaneum</i>	ssp	Q1	q7
19	IND81-144_ssp	IND81-144	<i>Saccharum spontaneum</i>	ssp	Q1	q7
20	IND81-155_ssp	IND81-155	<i>Saccharum spontaneum</i>	ssp	Q1	q7
21	IND81-161_ssp	IND81-161	<i>Saccharum spontaneum</i>	ssp	Q1	q7
22	IND82-257A_ssp	IND82-257A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
23	IND82-31_ssp	IND82-31	<i>Saccharum spontaneum</i>	ssp	Q1	q7
24	IS76-121_ssp	IS76-121	<i>Saccharum spontaneum</i>	ssp	Q1	q8
25	IS76-137_ssp	IS76-137	<i>Saccharum spontaneum</i>	ssp	Q1	q8
26	Isiolo_ssp	Isiolo	<i>Saccharum spontaneum</i>	ssp	Q1	q7

27	MMoentai_ssp	MMoentai	<i>Saccharum spontaneum</i>	ssp	Q1	q8
28	Mol1032A_ssp	Mol1032A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
29	Mol1032B_ssp	Mol1032B	<i>Saccharum spontaneum</i>	ssp	Q1	q7
30	Mpth97-107_ssp	Mpth97-107	<i>Saccharum spontaneum</i>	ssp	Q1	q7
31	Mpth97-204_ssp	Mpth97-204	<i>Saccharum spontaneum</i>	ssp	Q1	q7
32	Mpth97-209_ssp	Mpth97-209	<i>Saccharum spontaneum</i>	ssp	Q1	q7
33	Mpth97-213_ssp	Mpth97-213	<i>Saccharum spontaneum</i>	ssp	Q1	q7
34	Mpth97-216_ssp	Mpth97-216	<i>Saccharum spontaneum</i>	ssp	Q1	q7
35	Mpth97-233_ssp	Mpth97-233	<i>Saccharum spontaneum</i>	ssp	Q1	q7
36	Mpth97-3_ssp	Mpth97-3	<i>Saccharum spontaneum</i>	ssp	Q1	q7
37	NG77-169_ssp	NG77-169	<i>Saccharum spontaneum</i>	ssp	Q1	q8
38	Okinawa#01_ssp	Okinawa#01	<i>Saccharum spontaneum</i>	ssp	Q1	q8
39	PCA-NOR84-2A_ssp	PCA-NOR84-2A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
40	PCAV84-12A_ssp	PCAV84-12A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
41	PCAV84-12B_ssp	PCAV84-12B	<i>Saccharum spontaneum</i>	ssp	Q1	q7
42	PCAV84-12C_ssp	PCAV84-12C	<i>Saccharum spontaneum</i>	ssp	Q1	q7
43	PIN84-1B_ssp	PIN84-1B	<i>Saccharum spontaneum</i>	ssp	Q1	q7
44	PPGN84-08_ssp	PPGN84-08	<i>Saccharum spontaneum</i>	ssp	Q1	q8
45	PQ84-3_ssp	PQ84-3	<i>Saccharum spontaneum</i>	ssp	Q1	q7
46	S001_ssp	S001	<i>Saccharum spontaneum</i>	ssp	Q1	q8
47	S66-084A_ssp	S66-084A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
48	S66-084B_ssp	S66-084B	<i>Saccharum spontaneum</i>	ssp	Q1	q7
49	S66-121A_ssp	S66-121A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
50	SaudiArabia_ssp	SaudiArabia	<i>Saccharum spontaneum</i>	ssp	Q1	q8q7
51	SES006_ssp	SES006	<i>Saccharum spontaneum</i>	ssp	Q1	q7
52	SES084-58_ssp	SES084-58	<i>Saccharum spontaneum</i>	ssp	Q1	q7
53	SES114_ssp	SES114	<i>Saccharum spontaneum</i>	ssp	Q1	q7
54	SES147B_ssp	SES147B	<i>Saccharum spontaneum</i>	ssp	Q1	q7
55	SES189_ssp	SES189	<i>Saccharum spontaneum</i>	ssp	Q1	q7
56	SES205A_ssp	SES205A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
57	SES231_ssp	SES231	<i>Saccharum spontaneum</i>	ssp	Q1	q7
58	SES234A_ssp	SES234A	<i>Saccharum spontaneum</i>	ssp	Q1	q7

59	SES234B_ssp	SES234B	<i>Saccharum spontaneum</i>	ssp	Q1	q7
60	SES297B_ssp	SES297B	<i>Saccharum spontaneum</i>	ssp	Q1	q8
61	SES323A_ssp	SES323A	<i>Saccharum spontaneum</i>	ssp	Q1	q7
62	SH249_ssp	SH249	<i>Saccharum spontaneum</i>	ssp	Q1	q7
63	SM7916_ssp	SM7916	<i>Saccharum spontaneum</i>	ssp	Q3Q2	q8
64	sspT17_ssp	sspT17	<i>Saccharum spontaneum</i>	ssp	Q1	q7
65	sspT24_ssp	sspT24	<i>Saccharum spontaneum</i>	ssp	Q1	q7
66	sspT37_ssp	sspT37	<i>Saccharum spontaneum</i>	ssp	Q1	q7
67	SSpontPakistan_ssp	SSpontPakistan	<i>Saccharum spontaneum</i>	ssp	Q1	q7
68	TAINNAN_ssp	TAINNAN	<i>Saccharum spontaneum</i>	ssp	Q1	q7
69	US56-013-07_ssp	US56-013-07	<i>Saccharum spontaneum</i>	ssp	Q1	q7
70	ChukChe_ssi	ChukChe	<i>Saccharum sinense</i>	ssi	Q2	q3
71	Katha_ssi	Katha	<i>Saccharum sinense</i>	ssi	Q3	q1
72	Khakai_ssi	Khakai	<i>Saccharum sinense</i>	ssi	Q3	q4
73	LuCane_ssi	LuCane	<i>Saccharum sinense</i>	ssi	Q3Q2	q2
74	Mcikum_ssi	Mcikum	<i>Saccharum sinense</i>	ssi	Q2	q3
75	Merthi_ssi	Merthi	<i>Saccharum sinense</i>	ssi	Q2	q3
76	MiaLan_ssi	MiaLan	<i>Saccharum sinense</i>	ssi	Q2	q3
77	Nepal3_ssi	Nepal3	<i>Saccharum sinense</i>	ssi	Q2	q3
78	TanzhonBamboo_ssi	TanzhonBamboo	<i>Saccharum sinense</i>	ssi	Q2	q3
79	TekchaOkinawa_ssi	TekchaOkinawa	<i>Saccharum sinense</i>	ssi	Q2	q3
80	UbaDelNatal_ssi	UbaDelNatal	<i>Saccharum sinense</i>	ssi	Q2	q3
81	UbaIndia_ssi	UbaIndia	<i>Saccharum sinense</i>	ssi	Q2	q3
82	UbaNaquin_ssi	UbaNaquin	<i>Saccharum sinense</i>	ssi	Q2	q3
83	IJ76-339_sr	IJ76-339	<i>Saccharum robustum</i>	sr	Q3	q6
84	IJ76-534_sr	IJ76-534	<i>Saccharum robustum</i>	sr	Q1	q6
85	IM76-232_sr	IM76-232	<i>Saccharum robustum</i>	sr	Q1	q8q7q6
86	IN84-045_sr	IN84-045	<i>Saccharum robustum</i>	sr	Q3	q6
87	IN84-076_sr	IN84-076	<i>Saccharum robustum</i>	sr	Q1	q6
88	M3035-66_sr	M3035-66	<i>Saccharum robustum</i>	sr	Q3	q4
89	NG28-289_sr	NG28-289	<i>Saccharum robustum</i>	sr	Q1Q2Q3	q6
90	NG57-055_sr	NG57-055	<i>Saccharum robustum</i>	sr	Q1	q6

91	NG77-021_sr	NG77-021	<i>Saccharum robustum</i>	sr	Q3	q6
92	NG77-084_sr	NG77-084	<i>Saccharum robustum</i>	sr	Q3	q6
93	NG77-147_sr	NG77-147	<i>Saccharum robustum</i>	sr	Q3	q6
94	NG77-159_sr	NG77-159	<i>Saccharum robustum</i>	sr	Q3	q6
95	NG77-235A_sr	NG77-235A	<i>Saccharum robustum</i>	sr	Q3	q6
96	NG77-235_sr	NG77-235	<i>Saccharum robustum</i>	sr	Q3	q6
97	NH70-015_sr	NH70-015	<i>Saccharum robustum</i>	sr	Q2	q4q3
98	TeboeSalakToewa_sr	TeboeSalakToewa	<i>Saccharum robustum</i>	sr	Q3	q6
99	US57-141-05_sr	US57-141-05	<i>Saccharum robustum</i>	sr	Q3	q6
100	IJ76-375_se	IJ76-375	<i>Saccharum edule</i>	se	Q3	q6
101	NG77-010_se	NG77-010	<i>Saccharum edule</i>	se	Q3	q6
102	Agoule_sb	Agoule	<i>Saccharum barberi</i>	sb	Q2	q5
103	Chin_sb	Chin	<i>Saccharum barberi</i>	sb	Q2	q3
104	Chunnee_sb	Chunnee	<i>Saccharum barberi</i>	sb	Q2	q3
105	DarkPindaria_sb	DarkPindaria	<i>Saccharum barberi</i>	sb	Q2	q3
106	Dhaura_sb	Dhaura	<i>Saccharum barberi</i>	sb	Q2	q5
107	Ganapathy_sb	Ganapathy	<i>Saccharum barberi</i>	sb	Q2	q5
108	Hatuni_sb	Hatuni	<i>Saccharum barberi</i>	sb	Q1	q2
109	Henja_sb	Henja	<i>Saccharum barberi</i>	sb	Q3	q1
110	HulluKabbu_sb	HulluKabbu	<i>Saccharum barberi</i>	sb	Q2	q5
111	Kalari_sb	Kalari	<i>Saccharum barberi</i>	sb	Q2	q3q1q7
112	Keari_sb	Keari	<i>Saccharum barberi</i>	sb	Q2	q3
113	Khagzi_sb	Khagzi	<i>Saccharum barberi</i>	sb	Q1	q7(q5)
114	MangaSic_sb	MangaSic	<i>Saccharum barberi</i>	sb	Q1	q2
115	Matna_Shahj_sb	Matna.Shahj	<i>Saccharum barberi</i>	sb	Q1	q2
116	Nargori.1_sb	Nargori.1	<i>Saccharum barberi</i>	sb	Q1	q2
117	Nargori_sb	Nargori	<i>Saccharum barberi</i>	sb	Q1	q2
118	NEWRA_sb	NEWRA	<i>Saccharum barberi</i>	sb	Q1	q2
119	Pathri_sb	Pathri	<i>Saccharum barberi</i>	sb	Q2	q5
120	Paunra_sb	Paunra	<i>Saccharum barberi</i>	sb	Q2	q5
121	Rounda_sb	Rounda	<i>Saccharum barberi</i>	sb	Q2	q5
122	Ruckri_sb	Ruckri	<i>Saccharum barberi</i>	sb	Q2	q5

123	Semari_sb	Semari	<i>Saccharum barberi</i>	sb	Q3	q8q4
124	Sunnabile_sb	Sunnabile	<i>Saccharum barberi</i>	sb	Q2	q5
125	Terenu_sb	Terenu	<i>Saccharum barberi</i>	sb	Q2	q5
126	WhitePararia_sb	WhitePararia	<i>Saccharum barberi</i>	sb	Q2	q5
127	Akoki24_so	Akoki24	<i>Saccharum officinarum</i>	so	Q3	q4
128	BadilaFiji_so	BadilaFiji	<i>Saccharum officinarum</i>	so	Q3	q4
129	BadilaJava_so	BadilaJava	<i>Saccharum officinarum</i>	so	Q3	q4
130	Badilla_so	Badilla	<i>Saccharum officinarum</i>	so	Q3	q4
131	BandjermasinHitam_so	BandjermasinHitam	<i>Saccharum officinarum</i>	so	Q3	q4
132	BigRibbon_so	BigRibbon	<i>Saccharum officinarum</i>	so	Q3	q4
133	EK02_so	EK02	<i>Saccharum officinarum</i>	so	Q3	q4
134	Fiji1_so	Fiji1	<i>Saccharum officinarum</i>	so	Q3	q1
135	Fiji24_so	Fiji24	<i>Saccharum officinarum</i>	so	Q3	q4
136	Fiji47_so	Fiji47	<i>Saccharum officinarum</i>	so	Q3	q4q1
137	Green_German.1_so	GreenGerman.1	<i>Saccharum officinarum</i>	so	Q3	q1
138	GreenGerman_so	GreenGerman	<i>Saccharum officinarum</i>	so	Q3	q1
139	HawOrig36_so	HawOrig36	<i>Saccharum officinarum</i>	so	Q3	q4
140	IJ76-418B_so	IJ76-418B	<i>Saccharum officinarum</i>	so	Q3	q4
141	IJ76-521_so	IJ76-521	<i>Saccharum officinarum</i>	so	Q3	q1
142	IM76-245_so	IM76-245	<i>Saccharum officinarum</i>	so	Q3	q4
143	IN84-024_so	IN84-024	<i>Saccharum officinarum</i>	so	Q3	q4
144	IN84-068A_so	IN84-068A	<i>Saccharum officinarum</i>	so	Q3	q1
145	IN84-068B_so	IN84-068B	<i>Saccharum officinarum</i>	so	Q3	q1
146	LA_Purple_so	LA.Purple	<i>Saccharum officinarum</i>	so	Q3	q1
147	LA_Stripe_so	LA.Stripe	<i>Saccharum officinarum</i>	so	Q3	q4
148	LouisianaPurple_so	LouisianaPurple	<i>Saccharum officinarum</i>	so	Q3	q4
149	Mentor4745_so	Mentor4745	<i>Saccharum officinarum</i>	so	Q3	q1
150	MUNTOKJAVA_so	MUNTOKJAVA	<i>Saccharum officinarum</i>	so	Q1(3)	q1q7
151	NG21-003_so	NG21-003	<i>Saccharum officinarum</i>	so	Q3	q4
152	NG21-017_so	NG21-017	<i>Saccharum officinarum</i>	so	Q3	q4
153	NG57-223_so	NG57-223	<i>Saccharum officinarum</i>	so	Q3	q4
154	NG77-066_so	NG77-066	<i>Saccharum officinarum</i>	so	Q3	q4



155	NG77-142_so	NG77-142	<i>Saccharum officinarum</i>	so	Q3	q4
156	NG77-241_so	NG77-241	<i>Saccharum officinarum</i>	so	Q3	q6
157	NG96-024_so	NG96-024	<i>Saccharum officinarum</i>	so	Q3	q4
158	NH70-069_so	NH70-069	<i>Saccharum officinarum</i>	so	Q3	q4
159	OI_DENG_so	OI.DENG	<i>Saccharum officinarum</i>	so	Q3	q1
160	Saipan_so	Saipan	<i>Saccharum officinarum</i>	so	Q3	q4
161	CP00-1101Hyb	CP00-1101	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
162	CP72-1210Hyb	CP72-1210	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
163	CP80-1743Hyb	CP80-1743	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
164	CP88-1762Hyb	CP88-1762	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
165	CP89-2143Hyb	CP89-2143	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
166	Cuba_Hyb	Cuba	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
167	H095-988Hyb	H095-988	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
168	H78-4153Hyb	H78-4153	<i>Saccharum spp. hybrids</i>	Hyb	Q1Q3	q4q7
169	HoCP00950A_Hyb	HoCP00950A	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
170	HoCP00-950Hyb	HoCP00950	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
171	HoCP01-517_Hyb	HoCP01-517	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
172	HoCP85-845_Hyb	HoCP85-845	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
173	HoCP91-555Hyb	HoCP91-555	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
174	HoCP96-540A_Hyb	HoCP96-540A	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
175	HoCP96-540Hyb	HoCP96-540	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
176	L00-268Hyb	L00-268	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
177	L01-283_Hyb	L01-283	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
178	L01-299_Hyb	L01-299	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
179	L97-128Hyb	L97-128	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
180	L98-207Hyb	L98-207	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
181	L99-226Hyb	L99-226	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
182	L99-233_Hyb	L99-233	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
183	LCP85-384Hyb	LCP85-384	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
184	MEX85-6196_Hyb	MEX85-6196	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
185	N21_Hyb	N21	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
186	N27_Hyb	N27	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1

187	TCP93-4245Hyb	TCP93-4245	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
188	TCP97-4442A_Hyb	TCP97-4442A	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
189	TCP97-4442Hyb	TCP97-4442	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
190	TCP98-4445_Hyb	TCP98-4445	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
191	TCP98-4447_Hyb	TCP98-4447	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
192	TucCP77-42_Hyb	TucCP77-42	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
193	TX98-4447Hyb	TX98-4447	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
194	US01-39_Hyb	US01-39	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
195	US01-40_Hyb	US01-40	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1
196	US02-99_Hyb	US02-99	<i>Saccharum spp. hybrids</i>	Hyb	Q3	q1

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