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REGISTRATION

Cultivar

Registration of ‘Ho 11-573’ sugarcane

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Abstract

‘Ho 11-573’ (Reg. no. CV-201, PI 698597) sugarcane (an interspecific hybrid of *Saccharum officinarum* L., *S. barberi* Jeswiet, *S. spontaneum* L., and *S. sinense* Roxb. amend. Jeswiet) was selected and evaluated by scientists at the USDA-ARS, working cooperatively with the Louisiana State University Agricultural Center, the American Sugar Cane League of the U.S.A., Inc., and Rio Farms, Inc. It was released primarily for the Texas sugarcane industry. In field evaluations combined across crops and in ratoons, Ho 11-573 had yields equivalent to CP 89-2143 and CP 72-1210, the most widely grown Texas commercial cultivars. Cane yield (Mg/ha) of Ho 11-573 from plant-cane crop evaluations at five locations was significantly higher than CP 89-2143 or CP 72-1210. Ho 11-573 is moderately susceptible to smut and brown rust. It is resistant to leaf scald but is susceptible to ratoon stunt. Sugarcane mosaic and orange rust have not been observed on Ho 11-573.

1 | INTRODUCTION

Sugarcane (interspecific hybrids of *Saccharum* spp.) is primarily a tropical crop. In the continental United States, it is commercially grown in Florida, Louisiana, and Texas under semitropical to temperate conditions. Of these, Texas is the third-largest sugarcane producer in the United States (https://quickstats.nass.usda.gov/) with sugarcane grown on 16,916 ha of land in 2017 in the Rio Grande Valley. Of this land, approximately 70% is under two cultivars: CP 89-2143 (Glaz et al., 2000) and CP 72-1210 (Miller et al., 1981) (Rio Grande Valley Growers commercial variety survey 2019–2020, unpublished). There is a need to diversify plantings with new cultivars as insurance against cultivar decline and disease outbreaks. Currently, new cultivars for the Texas industry are being selected from promising clones from the USDA-ARS sugarcane breeding programs in Houma, LA, and Canal Point, FL, and the LSU AgCenter in St. Gabriel, LA. Experimental clones are sent for field evaluation in the

Abbreviations: SCYLV, *Sugarcane yellow leaf virus*; SrMV, *Sorghum mosaic virus*; SSR, simple sequence repeat; TRS, theoretical recoverable sucrose, theoretical recoverable sucrose.

sugarcane production area in the Lower Rio Grande Valley of Texas and selected based on yield performance. Following the assignment of a permanent designation in Louisiana in 2011, 'Ho 11-573' (Reg. no. CV-201, PI 698597) was evaluated in Texas and subsequently released in 2020. Ho 11-573 had a good performance in Louisiana in plant cane but was dropped due to poor performance in ratoon crops. The growing conditions between Texas and Louisiana differ markedly. Louisiana has a short growing season (7–9 mo) with high precipitation, while Texas has a longer growing season (12–15 mo) and relies on irrigation due to lower amounts of rainfall. Early harvest and winter cold temperature stress is a potential cause of poor ratooning (Milligan et al., 1996; Viator et al., 2010). The effect of winter and early harvest stress could have affected the yield of Ho 11-573 in Louisiana. Genotypes rejected in Louisiana due to poor ratooning could still be useful and productive in Texas where temperatures are warmer and the harvest season is longer. The release of Ho 11-573 demonstrates the ability to use promising genotypes with poor ratooning ability for commercial production for Louisiana in areas like Texas where weather conditions could be more favorable.

Core Ideas

- 'Ho 11-573' sugarcane cultivar was released to Texas growers.
- The cane yield of Ho 11-573 was comparable to the check cultivars but higher in plant cane.
- High cane yield makes Ho 11-573 a useful addition to current sugarcane cultivars in Texas.
- New cultivars increase diversity and improve the sustainability of the sugarcane industry.

2 | METHODS

2.1 | Crossing and early-stage selection

Ho 11-573 was derived from a cross between TUCCP 77-42 and HoCP 01-553, made at the USDA-ARS, Sugarcane Research Unit in Houma, LA, in 2004. The female parent, TUCCP 77-42 (Mariotti et al., 1991), a BC_1 of the *Saccharum spontaneum* clone SES 147B, was released as a commercial cultivar for the Argentina sugar industry. The male parent, HoCP 01-533, was an unreleased clone that was used for crossing whose female parent was LCP 85-384 (Milligan et al., 1994), which was once grown on 91% of the Louisiana sugarcane area but declined due to its susceptibility to sugarcane brown rust (caused by *Puccinia melanocephala* Syd. & P. Syd.) (Tew et al., 2005). The progeny population was planted to the field at the USDA-ARS Sugarcane Research Unit's Ardoyne Research Farm near Houma (Ho), LA (29.63° N, 90.84° W) in 2007. Ho 11-573 was selected as a seedling in 2008 for further evaluation in the USDA's Sugarcane Variety Development Program and was evaluated in Louisiana in the early stages of the Louisiana program before being assigned a permanent cultivar designation in 2011. Evaluation of Ho 11-573 continued in Louisiana as well as in Texas (Table 1) in different stages of off-station testing. A detailed summary of these stages of selection can be found in Tew et al. (2009). When compared with commercial cultivars in Louisiana, Ho 11-573 had lower ratoon cane yield and was thus dropped from further testing in Louisiana in 2019. Evaluations of Ho 11-573 continued under Texas growing conditions, and it was ultimately released based on its adaptation to Texas in March 2020. The release of Ho 11-573 sugarcane provides Texas growers a cultivar possessing yield necessary for productive and sustained cultivation under Texas growing conditions.

2.2 | Texas evaluations

In October 2011, researchers from Rio Farms, Inc., selected clones from among those assigned permanent names in Louisiana that year (Table 1) to evaluate their potential in the Texas sugarcane industry. Selections were made based on visual assessment and yield data. Seed cane of each selected clone was inspected in the field in Houma, LA, by a quarantine official prior to shipment to Texas. Stalks of selected clones, including Ho 11-573, were planted in a nursery in one-row plots approximately 12 m long in Weslaco, TX (26°13′20.53″ N, 97°59′30.67″ W) on 18 Nov. 2011. During the following year-long growing season, clones were evaluated for germination, vigor, and susceptibility to diseases and insects including but not limited to brown rust, smut [caused by *Sporisorium scitamineum* (Syd.) M. Piepenbr., M. Stoll & Oberw.], leaf scald [caused by *Xanthomonas albilineans* (Ashby) Dowson], and Mexican rice borer (*Eoreuma loftini* Dyar). In the fall of 2012, all plots were visually rated on a scale of 1–3, where 1 was considered a superior rating. Plots that received a vigor rating of 1 or 2 and had no visible symptoms of crop damaging diseases or insects were selected, and a five-stalk sample was taken for cane and juice analysis. Juice quality (Brix % and pol °Z) was analyzed at the mill core laboratory of the Rio Grande Valley Sugar Growers, Inc. Moisture content of the residue was used to help determine fiber (%cane). Brix %cane, pol %cane, and fiber %cane were used to estimate theoretical recoverable sucrose (TRS) according to Legendre (1992). Based on TRS (>230) and fiber content (<14.5%), experimental clones were selected and increased in five-row or six-row plots 30.5 m long, depending on the quantity of seed cane available, and spaced 1.5 m apart. These larger plots were evaluated in the same way as the nursery trials. Ten Brix

TABLE 1 Summary of the stages of development, evaluation, and eventual release of commercial sugarcane cultivar Ho 11-573

Year	Stage	Location
2004	Crosses made in December at the USDA Sugarcane Research Unit, Houma, LA; seed stored.	Louisiana
2007	Seed germinated at the USDA greenhouses at Houma, LA; seedlings planted into the field at the USDA Research Farm at Schriever, LA	Louisiana
2008	Selection in first-ratoon seedling crop (advanced to first-line trial)	Louisiana
2009	Selection in plant-cane first-line trials (advanced to second-line trial)	Louisiana
2010	Selection in plant-cane second-line trials (advanced to increase plot)	Louisiana
2011	Assignment in first-ratoon second-line trial and introduced to nursery in Texas	Louisiana, Rio Farms, TX
2012	Advanced to seed increase plot second-ratoon on-station yield trials harvested (1 location)	Rio Farms, TX
2013	Outfield trials planted at five locations across sugarcanegrowing areas (3 yr)	Five farms in Texas
2014	Plant-cane outfield trials harvested (five locations)	
2015	First-ratoon outfield trials harvested (five locations)	Rio Farms, TX
2016	Second-ratoon outfield trials harvested (five locations)	Five farms in Texas
2019	Dropped from Louisiana breeding program	Louisiana
2020	Released for Texas	Texas

TABLE 2 Texas sugarcane location names, GPS locations, and harvest dates

		Harvest date		
Location	Approximate GPS location	Plant cane	First ratoon	Second ratoon
Pennington Farm	26°28′28.26″ N, 97°50′ 1.10″ W	28 July 2015	4 Mar. 2016	2 Mar. 2017
Rio Farms	26°25′25.26″ N, 97°58′56.38″ W	10 Apr. 2015	12 Feb. 2016	25 Jan. 2017
Simmons Farm	26°7′49.33″ N, 97°43′22.07″ W	24 July 2015	26 Feb. 2016	21 Jan. 2017
Progresso	26°6′31.921″ N, 97°57′18.316″ W	4 Mar. 2015	4 Feb. 2016	not harvested
Whitfield Farm	26°25′50.49″ N, 97°55′47.59″ W	10 Apr. 2015	21 Jan. 2016	30 Jan. 2017

readings were obtained in the fall of 2013 from each increase plot using handheld punches and handheld refractometers. From late November 2013 through early January 2014, seed cane was cut from the increase plots with the highest Brix (>17), lowest disease and insect observation, and best visual ratings and planted in replicated yield trials on five commercial farms (outfield tests).

2.3 | Yield trials in commercial fields in Texas

Outfield test locations were strategically chosen based on soil type and geographic area. Tests were planted in randomized complete block designs with 21 clones in four replications of five-row, 9.1-m plots planted contiguously for 60 rows, with tests surrounded by commercial sugarcane. Individual test plots consisted of a 15.2-m buffer followed by a 9.1-m test strip separated from the next test strip by a 4.6-m alley. Test locations (Table 2) were Pennington Farm at Raymondville in a Raymondville clay loam soil (a fine, mixed, superactive, hyperthermic Vertic Calciustoll), Rio Farms in a Delfina fine sandy loam soil (a fine-loamy, mixed, superactive, hyperthermic Typic Paleustalf), Simmons Farm in a Harlingen clay soil (a very-fine, smectitic, hyperthermic Sodic Haplustert), Progresso on a Laredo silty clay loam (a fine-silty, mixed, superactive, hyperthermic Fluventic Haplustoll), and Whitfield Farm on FM1015 in a Racombes sandy clay soil (a fine-loamy, mixed, active, hyperthermic Pachic Argiustoll). Each location was harvested three times (Table 2). The primary reference cultivars were CP 72-1210 and CP 89-2143. During the 2019–2020 harvest season, CP 89-2143 was the most widely grown cultivar in Texas at approximately 57% of the area, and CP 72-1210 was second at approximately 13% of the area. Plot weights were determined by harvesting the inside three rows with a John Deere Combine Harvester Model CHW3520 and weighing the cane from each row with a custom Weight-Tronix Load Cell five-ton wagon to determine plot weight (Mg), which was used to estimate cane yield (Mg/ha). Plot subsamples (approximately 12 kg) were collected during harvest in burlap bags for juice analysis. All replications were sampled and processed through the core lab at the Rio Grande Valley Sugar Growers, Inc., as described above to determine TRS and fiber content.

2.4 | Statistical analyses

Plant-cane, and first and second ratoon yield data were analyzed using PROC MIXED v. 9.4 (SAS Institute, 2014), with cultivar as the fixed variable and location, crop, location × crop, crop × cultivar, location × cultivar, location × crop × cultivar interactions and replication, as random variables. To see the effect of crop, a separate model for each crop was made with cultivar as fixed and replication, location, and location × cultivar interaction as random. Least square means were generated for each cultivar and were separated using the DIFF option ($P = .05$).

2.5 | Disease and insect evaluations

All inoculated and designed spread tests for disease screening for mosaic (*Sorghum mosaic virus* [SrMV]), yellow leaf (*Sugarcane yellow leaf virus* [SCYLV]), smut, leaf scald, and ratoon stunt [caused by *Leifsonia xyli* subsp. *xyli* (Davis et al. 1984) Evtushenko et al. 2000] were conducted in Louisiana. Results were compared with cultivars grown in Louisiana. Observations for development of disease symptoms resulting from natural inoculation of pathogens was monitored throughout yield trials conducted in both Louisiana and Texas. Diseases of economic importance in Louisiana are important and common in Texas. The two leading cultivars grown in the Rio Grand Valley production area, CP 72-1210 and CP 89-2143 (Rio Grande Valley Growers commercial variety survey 2019–2020, unpublished), are susceptible to brown rust and orange rust [caused by *Puccinia kuehnii* (Kruger) E. Butler], respectively, and potentially provide inoculum for natural spread of these pathogens.

2.6 | Mosaic and yellow leaf

Mosaic disease on sugarcane is caused by SrMV and SCMV in the continental United States. The incidence of SrMV is common in Louisiana and Texas, whereas the incidence of SCMV is rare. Consequently, the opportunity for Ho 11-573 to be exposed to natural spread of SCMV was unlikely. Natural spread of SrMV was monitored in Louisiana field trials that included interspersed rows of SrMV-infected cultivars to act as a source of inoculum for spread by migrating aphids. Cultivar evaluation trials were also monitored for the development of symptoms of mosaic from natural spread of virus inoculum in Louisiana until 2013 and in Texas from 2011 until Ho 11-573 was released in 2020. The virus causing mosaic symptoms in experimental plants was determined using reverse transcription polymerase chain reaction analysis (Yang & Mirkov, 1997).

Similarly, natural spread of SCYLV was monitored in trials in Louisiana that included interspersed rows of a cultivar, LCP 85-384, infected with SCYLV and susceptible to the sugarcane aphid, *Melanaphis sacchari*, a commonly occurring vector of SCYLV in Louisiana (Akbar et al., 2011; Scagliusi & Lockhart, 2000). Visible symptoms of sugarcane yellow leaf may not be expressed during the short growing season in Louisiana; therefore, random leaf samples from the experimental cultivars were assayed by reverse transcription polymerase chain reaction for infection by SCYLV (Comstock et al., 1998).

2.7 | Smut and leaf scald

Ho 11-573 was evaluated in inoculated field trials at the USDA Research Farm in Schriever, LA, and the LSU AgCenter's Sugar Research Station in St. Gabriel, LA, for susceptibility to smut and leaf scald. The artificially inoculated trials were conducted as described by Tew et al. (2009), and natural infection from other research plots was also recorded.

2.8 | Brown rust and orange rust

Observations were made in performance trials in Louisiana and Texas for symptoms of brown rust and orange rust caused by natural infection. The molecular marker for brown rust resistance (Daugrois et al., 1996) was also run. Brown rust and orange rust were observed among experimental and released cultivars in disease and yield trials in Louisiana and in yield trials in Texas, confirming the presence of naturally occurring inoculum in these trials.

2.9 | Ratoon stunting disease

Susceptibility of experimental clones was determined by cutting seed cane with a cane knife dipped in a suspension of *L. xyli* subsp. *xyli* cells then planted in field trials in Louisiana. Mature plant cane stalks were analyzed by tissue-blot immunoassay (Grisham & Hoy, 2017). The level of susceptibility of the clones was based on the percentage of colonized vascular bundles compared with a cultivar with known levels of susceptibility.

2.10 | Borer damage

In October of 2017, a third ratoon sugarcane cultivar trial in Hidalgo County, Texas (Pennington Farm) including 13 clones (Ho 11-573 and 12 others) was evaluated for Mexican rice borer (*Eoreuma loftini* Dyar) damage. Ten stalks from each plot were cut at ground level at each site. Stalks were stripped of their leaves, bound with string, and labeled before transport to the North USDA Research Station site leased by Rio Farms. Sugarcane stalks were evaluated manually on 23–26 Oct. 2017. The outsides of the stalks were examined, and they were manually split lengthwise using knives to search for evidence of Mexican rice borer feeding tunnels, larval entrance scars, and adult emergence holes. Data were recorded on the number and position of the bored internodes on each stalk and then summarized to report the mean percentage of borer internodes. Least square means for the percentage of bored internodes were calculated and evaluated for significance of fixed effects (cultivar) using PROC MIXED (SAS v. 9.4) (SAS Institute, 2014).

2.11 | Agronomic and molecular descriptors

Plant descriptors for sugarcane from Artschwager and Brandes (1958) were used as a guide. Simple sequence repeat (SSR) genotyping was done according to Pan et al. (2007), in which a detailed description of sample preparation, polymerase chain reaction, fragment analysis, and data processing was given.

3 | CHARACTERISTICS

3.1 | Replicated yield trials

Results of the five-location outfield tests conducted throughout the Texas industry indicated that Ho 11-573 was not significantly different ($P \leq .5$) than the current standards CP 89-2143 or CP 72-1210 for cane (Mg/ha), sucrose content (kg/Mg), or sugar yield (Mg/ha) overall or in ratoon crops, but it was significantly higher ($P \leq .5$) in plant cane yield (Table 3). Since there is low sugarcane diversity in the Rio Grande Valley of Texas, new cultivars with different disease and pest resistances and equivalent yield are useful.

3.2 | Disease

Ho 11-573 is moderately susceptible to smut and brown rust but is resistant to leaf scald (Table 4). The molecular marker for brown rust resistance was not present in Ho 11-573. Ho 11-573 is susceptible to ratoon stunt as indicated by a high number of vascular bundles colonized by the bacterium in inoculated plants. Control of ratoon stunt is achieved in the domestic sugarcane industry through planting seed cane free of *L. xyli* subsp. *xyli* and using sanitation practices to prevent the introduction of new infection during the crop cycle.

In disease tests where rows of sugarcane infected with either SrMV or SCYLV were interspersed among test plots, multiple experimental clones were infected by natural spread of the two viruses; however, neither virus was detected in plots of Ho 11-573. Natural spread of orange rust was observed among experimental clones in disease and yield trials in Louisiana and among yield trials in Texas; however, no orange rust symptoms were observed among plots of Ho 11-573. Orange rust was observed in CP 89-2143 among

TABLE 3 Means of Ho 11-573 and commercial control cultivars in outfield cultivar trials for cane yield, sugar content, and sugar yield

Cultivar	Cane yield	Sugar content	Sugar yield
	Mg/ha	kg/Mg	Mg/ha
Combined overall means from five outfield tests across crops (2015–2017)			
Ho 11-573	112.57	97.38	10.74
CP 89-2143	108.87	99.44	10.70
CP 72-1210	111.28	99.09	10.80
Combined plant-cane means from five outfield tests (2015)			
Ho 11-573	153.39	90.13	13.33
CP 89-2143	138.41	94.94	12.33
CP 72-1210	140.97	91.75	12.73
Combined 1st stubble means from five outfield tests (2016)			
Ho 11-573	75.40	111.18	8.33
CP 89-2143	75.42	111.85	8.41
CP 72-1210	77.21	112.13	8.56
Combined 2nd stubble means from five outfield tests (2017)			
Ho 11-573	112.75	90.13	10.72
CP 89-2143	118.47	94.94	11.75
CP 72-1210	121.49	91.75	11.41

TABLE 4 Disease response of Ho 11-573 compared with other cultivars. Ratings represent the results from multiple inoculated trials or natural infection spread observations

Cultivar	Mosaic	Smut	Brown rust	Leaf scald	Ratoon stunt
HoCP 96-540[a]	R[b,c]	R	S	R	R
HoCP 04-838[a]	R[c]	R	R	MR	R
L 01-299[a]	R[c]	S	R	MR	S
Ho 07-613[a]	R[c]	R	MR	MR	T
Ho 11-573[a]	R[c]	MS	MS	R	S
CP 72-1210[d]	R[e]	MR	S	R	S
CP 89-2143[d]	MR[e]	R	R	R	MR

[a]Disease ratings taken from Louisiana.
[b]R, resistant; MR, moderately resistant; S, susceptible; MS, moderately susceptible; T, tolerant.
[c]Evaluated for *Sorghum mosaic virus*.
[d]Disease ratings taken from Florida.
[e]Evaluated for *Sugarcane mosaic virus*.

TABLE 5 Least squared means and standard errors (SE) of Mexican rice borer damaged internodes on third ratoon sugarcane cultivars at the Whitfield site and the Rio Farms Sandland site, Hidalgo County, TX

				Comparison with standards Pr > |*t*| (LSD)	
Location	**Cultivar**	**Mean**	**SE**	**CP 72-1210**	**CP 89-2143**
Whitfield	Ho 11-573	0.06564	0.02189	0.0207	0.7891
	CP 89-2143	0.05835	0.02179	0.0107	–
	CP 72-1210	0.1312	0.02179	–	0.0107
Rio Farms Sandland	Ho 11-573	0.1136	0.03132	0.0207	0.976
	CP 89-2143	0.1124	0.03132	0.0193	–
	CP 72-1210	0.2077	0.03132	–	0.0193

TABLE 6 The microsatellite (simple sequence repeat [SSR]) fingerprint of Ho 11-573 defined with 144 DNA fragments or alleles amplifiable by 21 pairs of SSR primers. The name of the SSR primer pair, allele size (bp), and the presence (+) or absence (−) of each allele are shown

Primer	**SMC119CG**						**SMC1604SA**					**SMC18SA**					**SMC24DUQ**					
bp	106	112	118	128	131	109	112	115	118	121	124	137	140	144	147	150	126	128	131	135	137	142
+/-	+	+	−	+	−	+	+	+	−	−	−	−	+	+	−	+	+	+	+	+	+	+
Primer		**SMC278CS**								**SMC31CUQ**												
bp	140	153	166	168	170	174	176	178	182	138	150	160	162	163	165	167	171	173	177	179		
+/-	−	+	−	+	−	+	−	−	+	−	+	−	−	−	+	−	+	−	−	+		
Primer	**SMC334BS**						**SMC336BS**											**SMC36BUQ**				
bp	146	149	151	161	163	164	141	154	164	166	167	169	171	173	175	177	183	112	118	121		
+/-	+	−	−	+	−	−	−	+	−	−	−	+	−	−	+	−	+	−	+	−		
Primer	**SMC486CG**					**SMC569CS**					**SMC7CUQ**											
bp	224	227	237	239	241	167	170	210	219	222	158	162	164	166	168	170						
+/-	−	−	+	+	−	+	−	−	−	+	+	+	+	+	+	−						
Primer		**SMC597CS**										**SMC703BS**										
bp	144	148	154	157	159	161	163	164	165	168	174	201	206	208	210	212	214	216	220	222		
+/-	+	+	−	+	−	+	−	−	+	+	−	+	+	−	−	+	−	+	−	−		
Primer	**SMC851MS**						**mSSCIR66**				**mSSCIR3**											
bp	128	130	132	134	136	141	127	130	132	134	141	145	171	173	175	177	178	180	182	187		
+/-	−	−	+	+	+	+	−	+	+	−	−	−	+	−	+	+	−	+	−	−		
Primer	**SMC1751CL**						**SMC22DUQ**						**mSSCIR43**									
bp	140	144	147	151	154	125	148	151	154	157	160	163	206	229	233	235	237	239	248	250	252	
+/-	−	+	+	+	+	−	−	+	−	−	−	−	−	−	−	−	+	−	−	+	+	
Primer	**mSSCIR74**																					
bp	217	220	223	226	229																	
+/-	+	+	+	+	−																	

non-experimental plantings in Louisiana and in yield trials in Texas.

3.3 | Borer resistance

Third ratoon results from two test locations in Texas indicate that damage to Ho 11-573 from Mexican rice borer was significantly lower than damage to CP 72-1210 at $P \leq .5$ level according to LSD test but was not significantly different than damage to CP 89-2143 (Table 5). Based on this information, Ho 11-573 may have better resistance than CP 72-1210 but is not significantly different than CP 89-2143, thus indicating a level of resistance similar to most released commercial cultivars in Texas.

3.4 | Agronomic, botanical, and molecular descriptors

Ho 11-573 has reddish brown colored narrow square dewlaps. The auricles are present, very dark gamboge in color, and long and lanceolate in shape. The leaf sheaths have no silicate hair and adhere loosely to the stalk. The rind color on stalks of Ho 11-573 is medium light yellow before exposure to sunlight and green yellow to yellow where the internodes are exposed to sunlight. The leaf canopy is moderate, erect with leaves bending inward. Internodes are cylindrically shaped with very few growth cracks. The bud is round, with a crawfish type wing. Adventitious roots are prominent on the bottom two joints.

The molecular identity of Ho 11-573 was defined with 144 DNA fragments or alleles amplifiable by 21 pairs of microsatellite (SSR primers) using a high-throughput procedure (Pan, Scheffler & Richard, 2007). The nucleotide sequence of these SSR primers can be found in Pan (2006). The potential number of SSR fragments amplifiable per SSR primer pair varied from 3 to 11, and the amplification profile for Ho 11-573 for each of the 21 pairs of SSR primers is shown in Table 6. The reported SSR fingerprint is used to represent the molecular identity of Ho 11-573 when comparing with those of other Louisiana commercial clones.

4 | CONCLUSIONS

Texas farmers have benefited from cultivars from external breeding programs such as CP 89-2143 selected by the USDA Sugarcane Field Station in Canal Point, FL. Cultivar development is important because new sugarcane cultivars are required to maintain high yield and profitability for area farmers. The USDA cultivar development program in Houma, LA, develops cultivars that perform well under Louisiana conditions, but during the breeding process there are many clones that are dropped for Louisiana but could be grown in Texas where they perform better due to a longer growing season and are productive. From such Louisiana genotypes, a group with promising yield was selected for evaluation in the lower Rio Grande valley of Texas. Among those, the cultivar Ho 11-573 was evaluated and released to Texas sugarcane growers in 2020 because of good yield performance and disease and insect resistance.

5 | AVAILABILITY

Small quantities of seed-cane of Ho 11-573 for research purposes will be maintained at the USDA-ARS Sugarcane Research Unit, located at Houma, LA, for five years following publication. It is not anticipated that a plant patent for Ho 11-573 will be sought.

AUTHOR CONTRIBUTIONS

James Todd: Formal analysis; Investigation; Supervision; Writing-original draft; Writing-review & editing. Anna Hale: Investigation; Resources; Supervision; Writing-review & editing. Yong-Bao Pan: Formal analysis; Investigation; Methodology; Writing-original draft; Writing-review & editing. Thomas L. Tew: Investigation; Resources; Supervision. Edwis O. Dufrene: Formal analysis; Investigation; Supervision. Michael Duet: Investigation. David Verdun: Data curation; Investigation; Methodology. Cory Landry: Investigation. Michael P. Grisham: Formal analysis; Investigation; Methodology; Project administration; Supervision; Writing-original draft; Writing-review & editing. Collins Kimbeng: Investigation; Resources; Supervision. Kenneth A. Gravois: Data curation; Investigation; Resources; Writing-review & editing. Keith P. Bischoff: Investigation; Resources; Supervision. Michael Pontif: Investigation; Supervision. Windell Jackson: Investigation; Resources. Herman Waguespack: Investigation; Resources. Wayne Davidson: Formal analysis; Investigation; Methodology. Andrew W. Scott, Jr.: Data curation; Investigation; Supervision; Writing-review & editing. Eduardo Hernandez: Investigation. Matt Klostermann: Project administration; Resources; Supervision. Gregg S. Nuessly: Formal analysis; Investigation; Writing-original draft. William White: Investigation; Methodology. Randy Richard: Investigation.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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