

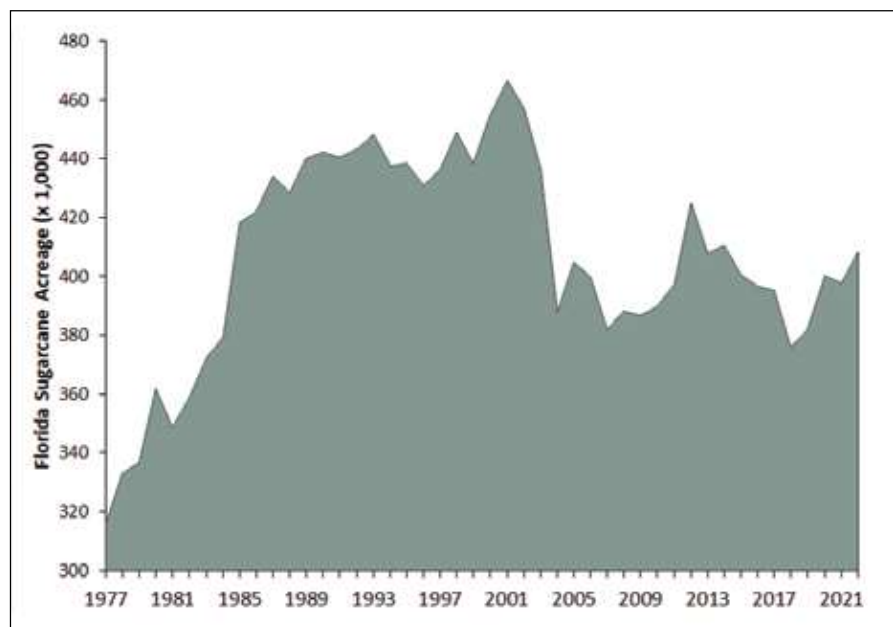
SUGARCANE VARIETY CENSUS: FLORIDA 2022

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Sugarcane Variety Census is the latest in a series of reports tracking acreage and variety trends for Florida's sugarcane industry. Single-year designations (ex: 2022) provided throughout the text, tables, and figures indicate the calendar year in which the sugarcane crop predominately grew, given that a typical sugarcane harvest occurs from October to May. Thus, at the completion of the 2022-2023 harvest season, mill managers provided 2022 crop data for the 2022 sugarcane variety census report. Official Florida sugarcane statistics are provided by the USDA-National Agricultural Statistics Service (NASS) and can be found at (<http://quickstats.nass.usda.gov/>). The main objectives of this annual census are to: 1) report variety preferences of Florida sugarcane growers, 2) summarize variety acreage by crop age (plant cane through fourth ratoon crop and older), 3) describe the distribution of sugarcane acreage and popular varieties across soil type (muck vs sand), and 4) to summarize plant cane strategies (fallow vs successive) in Florida sugarcane.

A total of 408,124 acres of sugarcane were reported for the 2022 crop (Table 1), and represents an increase

Figure 1. Total sugarcane acreage as reported in annual Florida variety census reports from 1977 through 2022.



of 10,459 acres from the 2021 crop (VanWeelden et al., 2022). From 1977 to 1987, the total sugarcane acreage in Florida increased from roughly 318,000 to 430,000 acres (Fig. 1). From 1987 through 2001, sugarcane acreage averaged at 442,000 acres, peaking at 466,000 in 2001. Following 2001, sugarcane acreage gradually dropped to 382,000 in 2007, but then

steadily increased to 425,000 acres in 2012. Up to 2018, sugarcane acreage steadily decreased to 375,642 acres, but then increased to 408,124 acres in 2022. The decrease in acreage leading to 2007 reflected marketing allocations within the U.S. sugar industry, conversion of cropland to public water storage in response to the Comprehensive Everglades Restoration Plan,

Table 1. Percent acreages by crop age occupied by the seven "principal varieties" that each comprised at least 1% of Florida's total 2022 sugarcane acreage.

VARIETY	TOTAL CANE (ACRES)	TOTAL CANE (%)	PLANT CANE (%)	1 ST RATOON CANE (%)	2 ND RATOON CANE (%)	3 RD RATOON CANE (%)	4 TH RATOON CANE (%)
CPCL 05-1201	123,540	30.3	37.7	29.9	25.9	22.4	24.3
CP 96-1252	111,446	27.3	26.8	29.6	24.4	25.4	37.9
CPCL 02-0926	35,154	8.6	3.4	7.0	11.3	20.5	14.4
CP 06-2042	23,199	5.7	3.9	5.9	8.6	4.7	0.9
CP 03-1912	11,040	2.7	3.5	2.8	2.7	1.2	0.4
CP 06-2400	6,246	1.5	2.1	1.6	1.2	0.9	0.5
CPCL 97-2730	4,842	1.2	1.2	1.5	1.2	0.6	0.5
ALL OTHERS	92,657	22.7	21.4	21.8	24.7	24.3	21.1
TOTAL ACRES	408,124	408,124	126,510	113,916	112,293	37,082	18,322
Crop age % (of total acres)			31.0	27.9	27.5	9.1	4.5

"All others" = sum of everything else (Mixed, Research, USDA, and any variety < 1%)

Table 2. Variety acreage (as a percentage of Florida's total sugarcane acreage) from 2013 through 2022 for the seven varieties that comprised at least 1% of Florida's 2022 sugarcane acreage.

VARIETY	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)	2018 (%)	2019 (%)	2020 (%)	2021 (%)	2022 (%)
CPCL 05-1201	-	-	-	2.9	5.6	12.9	17.5	21.7	25.6	30.3
CP 96-1252	11.4	16.8	22.5	28.8	34.2	35.8	34.0	30.2	29.8	27.3
CPCL 02-0926	-	-	-	1.3	3.4	7.9	12.0	13.1	11.5	8.6
CP 06-2042	-	-	-	-	-	1.0	2.8	4.8	5.8	5.7
CP 03-1912	-	-	-	-	-	-	1.5	2.0	2.4	2.7
CP 06-2400	-	-	-	-	-	1.2	1.6	1.5	1.3	1.5
CPCL 97-2730	-	1.4	2.4	3.8	5.9	5.6	5.0	3.1	2.2	1.2

The year marks the beginning of the harvest season, hence 2022 represents the 2022-2023 harvest season.

and reallocation of cropland for sod production in the early 2000's. Generally increasing sugarcane acreage trends between 2007 and 2012 reflect expansions into new sandland regions and abandoned citrus groves, and the conversion of other cropping systems into sugarcane in response to sugar market demands.

Plant cane represented 31.0% and ratoon cane 69.0% of Florida's 2022 sugarcane crop (Table 1), comparable to the 28.5% (plant cane) and 71.5% (ratoon cane) reported for 2021's crop (VanWeelden et al., 2022). Relative to Florida's total sugarcane acreage in 2022 (408,124 acres), ratoon crop distribution was 27.9% in first ratoon cane, 27.5% in second ratoon, 9.1% in third ratoon

cane, and 4.5% in fourth ratoon cane or older (Table 1), comparable to the 2021 ratoon distributions of 29.5, 29.1, 9.8, and 3.1%, respectively.

Florida growers reported growing 57 different varieties of sugarcane in 2022, unchanged from the number of varieties reported in 2021 (VanWeelden et al., 2022). Of the 57 varieties, 18 varieties were grown on less than 100 acres, 11 varieties were grown on small acreages (between 100 and 300 acres), 15 varieties were grown on slightly larger acreages (between 300 and 2,000 acres), and six varieties were grown on moderately large acreages (between 2,000 and 4,081 acres).

In 2022, seven sugarcane varieties were designated as "principal varieties",

defined as varieties occupying at least 1% ($\geq 4,081$ acres in 2022) of the total sugarcane acreage in Florida (Table 1). There were no new principal varieties in 2022. CP 05-1526, CPCL 05-1791, and CP 01-1372 were removed from the principal variety list from 2021.

The "CL" prefix indicates proprietary varieties developed by the United States Sugar Corporation (Clewiston, Florida), with plantings restricted to company fields or independent growers dedicated to sending their cane to the company's mill. The "CP" prefix indicates varieties developed by a cooperative program based at Canal Point (Florida), with cooperators including the United States Department of Agriculture, Agricultural

Research Service; the University of Florida / Institute of Food and Agricultural Sciences; and the Florida Sugar Cane League, Inc. The “CPCL” prefix indicates varieties that were initiated in the CL program and then in a cooperative agreement, the germplasms were further developed by the CP program, and ultimately released by the CP program. Current and historical census information for each of the ten principal varieties and for several varieties classified within “All others” are provided in the following sections. “All others” represents data reported as “Mixed”, “Research”, “USDA”, and specific varieties that each occupied less than 1% of Florida’s total sugarcane acreage.

CPCL 05-1201 (Rank 1)

CPCL 05-1201 (Edmé et al., 2016) was the most widely grown sugarcane variety as of 2022, with 123,540 acres planted (30.3% of total sugarcane acreage). CPCL 05-1201 became a new principal variety in 2016, occupying 2.9% of the total

sugarcane acreage (Table 2). CPCL 05-1201 is designated as a high tonnage, low sugar variety with good disease resistance and restubbling ability. Although CPCL 05-1201 has the Bru1 gene for brown rust (*Puccinia melanocephala*) resistance, low levels of brown and orange rust (*Puccinia kuehnii*) have been reported. Flowering begins in mid-December and is usually moderate to heavy. CPCL 05-1201 has small to moderate diameter stalks and moderate to high stalk populations. At maturity, this variety is moderately to heavily recumbent and has moderate freeze tolerance. CPCL 05-1201 was grown primarily on muck soils in 2022, which encompassed 78.4% of the variety’s total acreage (Table 4).

CP 96-1252 (Rank 2)

CP 96-1252 (Edmé et al., 2005) was grown on 111,446 acres in 2022, which represented 27.3% of the total sugarcane acreage in Florida (Table 1). CP 96-1252 was first designated a principal variety in 2009, occupying

1.6% of the acreage, and ranked first in terms of planted acreage from 2014 to 2021. Characteristics including moderate sucrose levels and high tonnage yields, in addition to resistance to several diseases, led to the release of CP 96-1252 in 2003. While CP 96-1252 displays resistance against orange rust, this variety has demonstrated susceptibility to brown rust following its release (Comstock et al., 2008), and growers are currently monitoring the health of their CP 96-1252 fields. Resistance to orange rust was instrumental in the expansion of CP 96-1252. Another concern regarding CP 96-1252 is early flowering, which can affect late harvest yields. Gradual increases of CP 96-1252 acreage onto sandy and marginal soils have occurred, with the percentage of acreage on these soils reaching 38.8% in 2021 (VanWeelden et al., 2022) and 35.8% in 2022 (Table 4).

CPCL 02-0926 (Rank 3)

CPCL 02-0926 (Glynn et al., 2013) acreage decreased to 35,154

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Table 3. Percentages of 2022 and 2023 acreages of the seven varieties that comprised at least 1% of Florida's 2022 sugarcane acreage.

VARIETY	COMBINED PLANT AND RATOON CANE			PLANT CANE ONLY			RATOON CANE ONLY		
	2021 (%)	2022 (%)	CHANGE (%)	2021 (%)	2022 (%)	CHANGE (%)	2021 (%)	2022 (%)	CHANGE (%)
CPCL 05-1201	25.6	30.3	4.7	32.1	37.7	5.6	23.0	27.0	4.0
CP 96-1252	29.8	27.3	-2.5	30.8	26.8	-4.0	29.4	27.5	-1.9
CPCL 02-0926	11.5	8.6	-2.9	6.8	3.4	-3.4	13.4	11.0	-2.4
CP 06-2042	5.8	5.7	-0.1	6.1	3.9	-2.2	5.7	6.5	0.8
CP 03-1912	2.4	2.7	0.3	3.1	3.5	0.4	2.1	2.4	0.3
CP 06-2400	1.3	1.5	0.2	1.6	2.1	0.5	1.2	1.3	0.1
CPCL 97-2730	2.2	1.2	-1.0	1.6	1.2	-0.4	2.4	1.2	-1.2

The year marks the beginning of the harvest season, thus 2022 represents the 2022-2023 harvest season.

acres in 2022, occupying 8.6% of the total sugarcane acreage. CPCL 02-0926 has low to moderate commercial recoverable sugar and moderate to high tonnage. In addition, this variety has the Bru1 gene for rust resistance but is moderately susceptible to orange rust. CPCL 02-0926 may flower lightly and has very good freeze tolerance. Two areas of concern are the prevalence of stalk cracks and its shorter height in the stubble crops. CPCL 02-0926 has a mostly small to sometimes medium stalk diameter with high stalk counts and good restubbling ability. In 2022, 96.6% of the acreage was on muck soils and 3.4% on sandy soils (Table 4).

CP 06-2042 (Rank 4)

CP 06-2042 (Davidson et al., 2017) was a new principal variety in 2018, occupying 1.0% of the total sugarcane acreage (Table 2) (VanWeelden et al., 2019). In 2022, CP 06-2042 increased to 23,199 acres (Table 1). At its' release, CP 06-2042 was recommended for muck and sand soils. CP 06-2042 is characterized by having moderate sucrose levels and higher tonnage yields. CP 06-2042 is susceptible to orange rust and yellow leaf disease, but resistant to brown rust due to the presence of the Bru1 gene. In addition, CP 06-2042

has demonstrated low freeze tolerance in terms of sugar degradation and does not typically flower. A majority of acreage was planted on muck soils (78.8%) in 2022, compared to sandy soils (21.2%) (Table 4).

CP 03-1912 (Rank 5)

CP 03-1912 (Gilbert et al., 2011) was a new principal variety in 2019, and occupied 11,040 acres in 2022 (Tables 1,2). CP 03-1912 was recommended for sand soils upon its release, as brittleness and lower sugar yields were exhibited on muck soils. CP 03-1912 is characterized by having lower sucrose levels and higher ton-

nage yields. In terms of diseases, CP 03-1912 is susceptible to smut and yellow leaf disease, moderately resistant to orange rust, leaf scald, and ratoon stunt disease (RSD), and resistant to sugarcane mosaic and brown rust. In 2022, 98.8% of CP 03-1912 was grown on sand soils (Table 4).

CP 06-2400 (Rank 6)

CP 06-2400 (Zhao et al., 2015) was a new principal variety in 2018, and occupied 6,246 acres in 2022 (Tables 1,2). At its release, CP 06-2400 was recommended for muck soils only. CP 06-2400 is characterized by having lower sucrose levels and higher

Table 4. Total variety acreage by soil type, the fraction (percentage) of the total soil type acreage occupied by variety, and variety distribution across soil type for each of the seven varieties that occupied at least 1% of Florida's 2022 sugarcane acreage.

VARIETY	TOTAL ACREAGE AND FRACTION (%) OF SOIL TYPE OCCUPIED BY EACH VARIETY				VARIETY DISTRIBUTION ACROSS SOIL TYPE	
	MUCK SOIL		SAND SOIL		MUCK	SAND
	ACRES	(%)	ACRES	(%)	(%)	(%)
CPCL 05-1201	96,892	32.9	26,648	23.4	78.4	21.6
CP 96-1252	70,639	24.0	40,807	35.8	63.4	36.6
CPCL 02-0926	33,959	11.5	1,194	1.0	96.6	3.4
CP 06-2042	18,279	6.2	4,920	4.3	78.8	21.2
CP 03-1912	137	0.0	10,903	9.6	1.2	98.8
CP 06-2400	6,147	2.1	99	0.1	98.4	1.6
CPCL 97-2730	141	0.0	4,702	4.1	2.9	97.1
ALL OTHERS	67,895	23.1	24,762	21.7	73.3	26.7
TOTAL ACRES	294,090		114,034		72.1	27.9
% SOIL TYPE	MUCK SOIL	72.1	SAND SOIL	27.9		

tonnage yields. CP 06-2400 does not normally flower and has moderate to high freeze tolerance in terms of sugar degradation. CP 06-2400 has the Bru1 gene for brown rust resistance, and is moderately resistant to orange rust but moderately susceptible to scald; however, susceptibilities to ratoon stunt disease (RSD) and yellow leaf disease have been documented. In addition, significant skips have been observed under wet planting conditions. In 2022, 98.4% of CP 06-2400 was grown on muck soils (Table 4).

CPCL 97-2730 (Rank 7)

CPCL 97-2730 (Milligan et al., 2009) was the first “CPCL” released after the transfer of United State Sugar Corporation “CL” breeding material to the USDA Center at Canal Point. In 2014, CPCL 97-2730 became a principal variety representing 1.4% of the total sugarcane acreage in Florida (Table 2). In 2022, 4,842 acres of CPCL 97-2730 were planted, dropping to the seventh most planted

Table 5. Actual and percentage plant cane acreages in the 2022 fallow and successive planting systems for the seven varieties that comprised at least 1% of Florida's 2022 sugarcane acreage

VARIETY	FALLOW SYSTEM		SUCCESSIVE SYSTEM	
	ACRES	(%)	ACRES	(%)
CPCL 05-1201	24,269	32.5	23,366	45.2
CP 96-1252	19,607	26.2	14,337	27.7
CPCL 02-0926	3,232	4.3	1,081	2.1
CP 06-2042	2,321	3.1	2,656	5.1
CP 03-1912	4,384	5.9	0	0.0
CP 06-2400	1,712	2.3	959	1.9
CPCL 97-2730	1,407	1.9	57	0.1
ALL OTHERS	17,832	23.9	9,292	18.0
TOTAL ACRES	74,763	59.1	51,748	40.9

variety (Table 1). Relative to Florida's total plant cane acreage, CPCL 97-2730 remained at 1.2% in 2022 (Table 3). CPCL 97-2730 is characterized as having high sucrose levels and moderately high tonnage yields on sand, as well as moderate disease resistance and ratooning ability. As this variety performs better on sand, 97.1% of the CPCL 97-2730's total

acreage was grown on sandy soils, compared to 2.9% on muck soils, in 2022 (Table 4).

Other Varieties

The absence of plant and ratoon cane indicates that a variety has been phased out of commercial production. No varieties were phased out during the 2022-23 growing season.



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Soil Type

Data reported by Florida's sugarcane mills classified sugarcane acreage as organic "muck" (72.1%) or sand (27.9%) soils (Table 4). To be classified as an organic soil, soils need at least 20 to 30 percent organic matter by weight. A majority of Florida's organic soils used for sugarcane production contain significantly greater than 30% organic matter, while sand soils are significantly less than 20%.

While a number of sugarcane varieties are preferably grown on specific soil types (muck vs sand), the reader is cautioned as most varieties appear to favor muck due to the greater percentage of total sugarcane acreage grown on this soil type (72.1%) (Table 4). For example, CP 96-1252's acreage distribution by soil type in 2022 was 63.4% on muck soils and 36.6% on sand soils (Table 4). Given that the overall distribution of sugarcane acreage was 72.1% on muck soils and 27.9% on sand soils, CP 96-1252 was preferred relatively equally across soil types. Varieties strongly preferred on muck soils included CP 06-2400 (98.4% growing on muck) and CPCL 02-0926 (96.6%) (Table 4). Varieties strongly preferred on sand soils were CP 03-1912 (98.8% growing on sand) and CPCL 97-2730 (97.1%) (Table 4). The variety with the most uniform distribution across soil types was CP 96-1252 (63.4% on muck and 36.6% on sand). When considering total acreage on a specific soil type, varieties with the most acreage on muck included CPCL 05-1201 (32.9% of all Florida cultivated muck soil), CP 96-1252 (24.0%), and CPCL 02-0926 (11.5%), while varieties with the most acreage on sand included CP 96-1252 (35.8% of all Florida cultivated sand soil), CPCL 05-1201 (23.4%), and CP 03-1912 (9.6%) (Table 4).

Fallow and Successive Planting

Plant cane acreage was categorized as being planted in a "fallow" or "successive" planting system. In the fallow system, following the final ratoon crop, fields are temporarily rotated with another crop (sweet corn, rice, beans, leafy vegetables), left fallow, or flooded

while fallow. In the successive system, a new sugarcane crop is planted soon after the final ratoon crop is harvested.

Plant cane acreage in 2022 was 126,510 acres (Table 1), with 74,763 acres (59.1%) fallow planted and 51,748 acres (40.9%) successively planted (Table 5). In general, fallow planting is preferred on sand soils while successive planting is preferred on muck soils.

Other Variety Trends

The top three principal varieties (CPCL 05-1201, CP 96-1252, and CPCL 02-0926) accounted for 66.2% of the total sugarcane acreage in 2022, a decrease from 2021, where the same top three principal varieties accounted for 66.9% of the total sugarcane acreage. The percentage of sugarcane acreage represented by the top three principal varieties has generally increased since 2016, mainly due to the increasing acreage of CP 96-1252 and CPCL 05-1201.

Acknowledgments

The authors thank Timothy Dixon (Sugar Cane Growers Cooperative of Florida), Diego Luzuriaga (Florida Crystals Corporation), and Christopher LaBorde (United States Sugar Corporation) for their assistance in providing sugarcane acreage and variety data for this article.

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