

Sugarcane Variety Census: Florida 2004¹

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This annual variety census of the Florida sugarcane industry for the 2004-2005 harvest season is the latest in a series of annual reports. Mill managers and independent growers supplied the data for this report. The census primarily reflects variety preferences of Florida sugarcane growers, and it categorizes their crop as plant cane, first ratoon, second ratoon, third ratoon, and fourth ratoon and older. The census also reports percentages of organic versus sand soils, planting in regular versus successive systems, and planting by manual versus mechanical systems.

A total of 387,888 acres of sugarcane were reported for sugar and seed production for the 2004-2005 crop. This represents a decrease of 51,451 acres compared to the 439,339 acres grown in the 2003-2004 season, and is in addition to the 18,031 acres reduction reported last year (Glaz and Vonderwell, 2004). Florida's sugarcane acreage is now at an amount similar to that of 1984. Florida's total sugarcane acres increased from about 300,000 to nearly 450,000 from 1976 through 1987. There

have been some fluctuations since 1987, but the Florida sugarcane acreage has generally been near 450,000 since 1985. The drop in sugarcane area this year is the largest drop on record. This decline resulted from the institution of marketing allotments on the U.S. sugar industry and the conversion of land from sugarcane production to public water storage as part of the Comprehensive Everglades Restoration Plan.

Plant cane represented 32.8 percent and ratoon cane 67.2 percent of Florida's 2004-2005 sugarcane crop. This is a moderate change from the percentages of 31.7 for plant cane and 68.3 for ratoon cane reported last year (Glaz and Vonderwell, 2004). The distribution of ratoon cane was 31.1 percent as first ratoon, 24.5 percent second ratoon, 7.5 percent third ratoon, and 4.1 percent as fourth ratoon or older of the total acreage reported this year. These compared with 2003-2004 percentages of 31.7, 24.4, 8.6, and 3.6, respectively. There have been only moderate fluctuations of annual percentages in plant cane through fourth ratoon and older from 2002 through 2004.

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Florida growers reported growing 64 varieties of sugarcane this year. Nine principal varieties each covered at least 1.0 percent of the total cane area (Table 1). All varieties reported in this census were associated with one of two breeding programs. A recently discontinued program of the United States Sugar Corp. of Clewiston, Florida developed 34 varieties identified by a "CL" prefix. A cooperative program based at Canal Point, Florida developed 30 varieties identified by a "CP" prefix. 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. contributed to the cooperative program at Canal Point. The group labeled as "All others" represented varieties that each made up less than 1.0 percent of the total acreage.

The most widely-grown variety in Florida this year was CP 80-1743 with 33.0 percent of the total cane area (Table 1). This is the sixth consecutive year that CP 80-1743 was the most widely grown variety, and its use has increased each of these years (Table 2). This year's increase of 4.3 percent was the largest percentage increase in acreage for CP 80-1743 since it became the most widely grown variety in Florida. However, CP 80-1743 achieved this acreage increase with a decrease of 3.6 percent in plant-cane acreage: the largest decrease in plant cane of all of Florida's principal varieties (Table 3). CP 80-1743 has high yields of tonnage and sugar concentration and good ratoon yields; it comprised 45.8 percent of Florida's sugarcane in fourth ratoon and older (Table 1). In 2004, Florida growers learned that CP 80-1743 yields and seed cane quality were damaged substantially by the high winds associated with two hurricanes. Other concerns about CP 80-1743 are substantial yield losses under high water tables (Glaz et al., 2002), susceptibility to leaf scald, growth cracks, sugar losses during the last half of the harvest season, and rapid juice quality deterioration after severe freezes. Therefore, Florida growers place a high priority on harvesting their remaining fields of CP 80-1743 after severe freezes. Gilbert et al. (2004) recommended harvesting CP 80-1743 in the early portion of the harvest season.

CP 89-2143 was in twelfth place in the 2000 census (Glaz, 2000), and two years ago, it was in

seventh place with 3.5 percent of the total acreage (Glaz and Vonderwell, 2003). Last year, CP 89-2143 climbed to fourth place with 10.7 percent of the total acreage (Glaz and Vonderwell, 2004). This year, CP 89-2143 continued its climb by finishing in second place with 14.9 percent of the total acreage (Table 1).

The increased use of CP 89-2143 by 4.2 percent was second only to the increased use of CP80-1743 by 4.3 percent (Table 3). The increase in CP 89-2143 plant-cane acres by 5.8 percent was the largest plant-cane increase among principal varieties this year (Table 3). CP 89-2143 has excellent yields of tonnage and sugar concentration throughout the harvest season. In addition, Shine, Jr. et al. (2002) reported that CP 89-2143 had outstanding freeze tolerance. Gilbert et al. (2004) encouraged the harvesting of CP 89-2143 throughout the harvest season. CP 89-2143 is used as one of three reference varieties in the CP variety development program.

CP 88-1762 was the third-place variety this year for the second consecutive year, with 11.4 percent of the total acreage (Tables 1 and 2). It classified as a principal variety for the first time in 1999. At that time, it made an unusually large acreage increase for a new variety from 0.8 percent in 1998 to 2.0 percent in 1999 (Table 2). Gilbert et al. (2004) recommended harvesting CP 88-1762 early in the harvest season.

CP 78-1628 was in fourth place this year following two years as the second place variety (Tables 1 and 2). CP 78-1628 comprised 11.4 percent of the total acreage, a drop of 0.9 percent compared to last year, and this follows a drop of 0.4 percent the previous year (Table 2). This decrease included a 1.9 percent decline in ratoon acreage for CP 78-1628 and a 1.1 percent increase in plant-cane acreage (Table 3). CP 78-1628 has been the most widely grown variety on sand soils in Florida for the past six years, where its use increased from 36.4 percent last year to 43.6 percent this year (Glaz and Vonderwell, 2004 and Table 4). The cause of the moderate decline in use of CP 78-1628 is probably the decline in sugarcane grown on sand soils in Florida, from 78,281 acres last year to 63,111 acres this year. Gilbert et al. (2004) recommended harvesting CP 78-1628 in the middle portion of the

harvest season. CP 78-1628 is used as a reference variety in the CP variety development program.

CP 72-2086 was the most widely grown variety in Florida in 1994 (Glaz, 1995), the second-most widely grown variety for the following seven years, and the third most widely grown variety in 2002 (Table 2). This year, with 8.0 percent of the acreage, CP 72-2086 was in fifth place for the second consecutive year. Sugarcane mosaic was discovered in Florida on CP 72-2086 in 1996, the year of its highest percentage use (Table 2). Since 1996, use of CP 72-2086 has declined from 18.0 percent to 8.0 percent this year (Table 2). This downward trend for CP 72-2086 may be leveling off because the plant-cane percentage of CP 72-2086 dropped by only 0.7 and 0.9 percent this year and last year, respectively, compared with 5.6 percent two years ago. Gilbert et al. (2004) recommended harvesting CP 72-2086 late in the harvest season. CP 72-2086 is used as a reference variety in the cooperative variety development program at Canal Point.

For the fourth consecutive year, CP 84-1198 was the sixth-place variety, and it had 4.8 percent of the acreage three out of these four years (Table 2). Growers report that to avoid unacceptable reductions in ratoon yields, CP 84-1198 needs special attention during its mechanical harvest. Similarly, it is difficult to obtain viable mechanically cut seed cane of CP 84-1198. Its advantages are its high sugar concentration and tonnage yields, drought tolerance, and wide adaptability. Gilbert et al. (2004) recommended harvesting CP 84-1198 in the middle and late portions of the harvest season. The 2003-2004 Clewiston Sugar Festival Award for highest yield at a "sand land" location was won by the United States Sugar Corp. with a field of CP 84-1198.

For the second consecutive year, CL 77-797 was the seventh most widely grown sugarcane variety in Florida with 3.3 percent of this year's total cane area (Table 1). CL 77-797 increased in use from 1994 until 2000 when it was planted on 6.3 percent of Florida's sugarcane acreage, but has been declining since 2000 (Table 2). The drop of 1.5 percent in combined plant and ratoon cane for CL 77-797 was the largest percentage drop among principal varieties

(Table 3). The 2003-2004 Clewiston Sugar Festival Award for highest yield at a "warm muck" location was won by the United States Sugar Corp. with a field of CL 77-797.

CP 73-1547 was the eighth most widely grown variety for the second consecutive year with 1.6 percent of the total cane area (Table 2). CP 73-1547 continued its decline in percent acreage this year, a decline that began in 1994 (Table 2). In recent years, these declines are probably due to yield losses resulting from the susceptibility of CP 73-1547 to sugarcane rust and lower ratoon yields on sand compared with CP 78-1628. CP 73-1547 remained the second most widely grown variety on sand soils, but its 8.6 percent of the sand acreage was 35 percentage points lower than the 43.6 percent of CP 78-1628 (Table 4).

CP 84-1591 became a principal variety for the first time this year with 1.1 percent of the total acreage. CP 84-1591 was released primarily due to its high cane and sugar per acre yields on sand soils (Shine Jr. et al., 1996), and it has been used almost exclusively on sand soils. This year, CP 84-1591 was grown on 6.4 percent of the sand soils in Florida planted with sugarcane (Table 4). Overall use of CP 84-1591 has risen slowly from 0.4 percent in 1998 to 1.1 percent this year (Table 2).

This year was the first year since 1980 that CL 61-620 has not been a principal variety in Florida, and the first year since 1978 that CP 70-1133 has not been a principal variety. CP 70-1133 was the most widely grown variety in Florida from 1982 through 1984 (Glaz and Donovan, 1984). Both CL 61-620 and CP 70-1133 are susceptible to sugarcane rust. Other reasons for the decline of CP 70-1133 are its low sugar concentration and difficulty in harvesting it on organic soils.

Among the varieties grouped as "all others," CL 69-886, CP 70-1527, CP 72-1210, CP 85-1308, CP 85-1382, CP 86-1633, CP 89-1509, CP 92-1167, CP 92-1213, and CP 92-1641 all had no acres as plant cane this year. The absence of plant cane for a variety indicates that its commercial use may soon stop. Varieties that were released for commercial use in Florida and not reported in the census for the first

time this year were CL 73-239, CP 65-357, CP 80-1557, CP 88-1508, and CP 89-2377.

Of their soils planted to sugarcane this year, growers classified 83.7 percent of their soils as organic and 16.3 percent as sand (Table 4). These percentages were moderately different from the 82.1 percent for organic and the 17.9 percent for sand soils reported last year (Glaz and Vonderwell, 2004).

Organic soils contain a minimum of 20 to 30% organic matter, by weight, depending on the clay content (higher organic matter required as clay content increases). Most organic soils used for sugarcane in Florida have substantially more than 30% organic matter and most sand soils used for sugarcane have far less than 20% organic matter. However, some sugarcane in Florida is grown on soils that would require a weighed analysis for proper determination.

Growers had variety preferences according to soil. The only varieties with at least 2,500 acres grown on both soil types were CP 80-1743, CP 78-1628, and CP 84-1198. CP 88-1762, CP 72-2086, and CL 77-797 were grown almost exclusively on organic soils, and CP 73-1547 and CP 84-1591 were used primarily on sand soils. CP 89-2143 was primarily used on organic soils, but it almost had 2,500 acres on sand soils. CP 78-1628, the most popular variety on sand soils (43.6 percent), was also a major variety on organic soils (5.1 percent).

All plant-cane acres were categorized as planted in a "regular" or "successive" planting system. In the regular system, growers do not plant sugarcane after a final-ratoon harvest until the following planting season. Growers often plant at least one other crop, such as sweet corn, rice, snap beans, leafy vegetables, or radishes before the next sugarcane crop is planted in this regular system. Sugarcane is planted several weeks after a final-ratoon sugarcane harvest in the successive planting system.

Of the 127,207 plant-cane acres classified by planting system, 70,118 (55.1 percent) were planted in the regular system and 57,089 (44.9 percent) were successively planted (Table 5). These figures denote a shift back to regular planting compared with the 44.2 percent planted in the regular system and 55.8

percent planted in the successive system in 2003 (Glaz and Vonderwell, 2004). Since 1996, there have been several shifts between the regular and successive planting systems. From 1990 to 1996, more sugarcane in Florida was annually planted in the successive compared with the regular system.

CP 80-1743, CP 89-2143, and CP 88-1762 were the varieties most widely planted in the successive system, but each of these varieties also had substantial plant cane in the regular system (Table 5). CP 78-1628, CP 72-2086, CP 84-1198, and CL 77-797 were more widely planted in the regular compared with the successive system, but each of these had a substantial portion of their plant cane in the successive system. CP 73-1547 and CP 84-1591 were primarily planted in the regular system.

Florida growers have been analyzing and improving mechanical planting systems in recent years. This year, growers provided data from 94.5 percent (120,200 acres) of the total 127,207 plant-cane acres to quantify the percentage use of manual versus mechanical planting (Table 6). Manual planting was used on approximately 56 percent and mechanical planting on approximately 44 percent of the 2004-2005 plant-cane crop in Florida. This is a substantial change from last years 67 percent manually planted and 33 percent mechanically planted sugarcane (Glaz and Vonderwell, 2004). CL 77-797 and CP 73-1547 were almost exclusively planted mechanically, and CP 78-1628, CP 84-1198, and CP 84-1591 had more acres mechanically than manually planted. CP 88-1762 had a high ratio of manual to mechanical planting, and CP 72-2086 was almost exclusively planted manually. However, mechanical planting increased substantially compared with last year, and much of this increase was on organic soils.

The three most widely grown varieties accounted for 61.1 percent of Florida's 2004 sugarcane, a considerable increase compared with the 52.4 percent reported last year (Table 7). The top three varieties, CP 80-1743, CP 89-2143, and CP 88-1762, increased in percentage use by 4.3, 4.1, and 1.8 percent respectively (Table 3). The 61.1 percent of the acreage planted to the top three varieties for this year is the highest percentage of this ten-year reporting period, and the second highest, 52.4 percent, was

reported last year (Table 7). This was the eighth consecutive year that CP 80-1743 was among the three most widely grown sugarcane varieties in Florida, the second consecutive year for CP 88-1762, and the first year for CP 89-2143.

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Table 1. Percentages of 2004 Florida sugarcane planted to each of nine cultivars that comprised at least one percent of the total acreage.

Cultivar	Total Cane Grown	Plant cane	First-ratoon Cane	Second-ratoon Cane	Third-ratoon cane	Fourth-ratoon cane and older
Percent						
CP 80-1743	33.0	29.9	36.6	28.7	39.2	45.8
CP 89-2143	14.9	18.1	13.1	17.6	6.5	1.7
CP 88-1762	13.2	14.4	12.9	11.7	14.7	10.9
CP 78-1628	11.4	12.8	10.2	11.1	11.0	12.0
CP 72-2086	8.0	7.4	8.3	10.7	4.1	2.5
CP 84-1198	4.8	5.6	4.6	5.2	3.0	0.8
CL 77-797	3.3	3.2	3.7	2.3	4.8	3.4
CP 73-1547	1.6	1.3	1.6	0.9	3.4	4.0
CP 84-1591	1.1	1.1	1.0	0.8	1.0	3.6
All others	8.7	6.2	8.0	11.0	12.3	15.3
Total Acres	387,888	127,207	120,600	94,801	29,247	16,032

Table 3. Percentages of 2003 and 2004 acreages for each of nine cultivars that comprised at least one percent of Florida's 2004 sugarcane acreage.

Cultivar	Combined plant and ratoon cane			Plant cane only			Ratoon cane only		
	2003	2004	Change	2003	2004	Change	2003	2004	Change
Percent									
CP 80-1743	28.7	33.0	4.3	33.5	29.9	-3.6	26.5	34.6	8.1
CP 89-2143	10.7	14.9	4.2	12.3	18.1	5.8	10.0	13.3	3.3
CP 88-1762	11.4	13.2	1.8	13.4	14.4	1.0	10.4	12.6	2.2
CP 78-1628	12.3	11.4	-0.9	11.7	12.8	1.1	12.6	10.7	-1.9
CP 72-2086	9.1	8.0	-1.1	8.1	7.4	-0.7	9.6	8.3	-1.3
CP 84-1198	4.8	4.8	0.0	4.1	5.6	1.5	5.2	4.4	-0.8
CL 77-797	4.8	3.3	-1.5	4.7	3.2	-1.5	4.8	3.3	-1.5
CP 73-1547	2.3	1.6	-0.7	1.3	1.3	0.0	2.8	1.7	-1.1
CP 84-1591	0.8	1.1	0.3	1.0	1.1	0.1	0.8	1.1	0.3

Table 5. Actual and percentage acreage in regular and successive planting systems for each of nine cultivars that comprised at least one percent of Florida's 2004 sugarcane.

Cultivar	Regular System		Successive system	
	Acres	Percent	Acres	Percent
CP 80-1743	17,922	25.6	20,071	35.2
CP 89-2143	10,347	14.8	12,617	22.1
CP 88-1762	8,435	12.0	9,910	17.4
CP 78-1628	11,992	17.1	4,243	7.4
CP 72-2086	5,414	7.7	4,048	7.1
CP 84-1198	4,649	6.6	2,477	4.3
CL 77-797	2,687	3.8	1,371	2.4
CP 73-1547	1,620	2.3	20	0.0
CP 84-1591	1,329	1.9	133	0.2
All others	5,723	8.2	2,198	3.9
Total	70,118	100.0	57,089	100.0

Table 7. Percentage of the total sugarcane acreage of the three most widely grown cultivars in Florida in each of ten years since 1995.

Year	Percent	Cultivar rank		
		First	Second	Third
1995	44.6	CP 80-1827	CP 72-2086	CL 61-620
1996	47.3	CP 80-1827	CP 72-2086	CL 61-620
1997	46.6	CP 80-1827	CP 72-2086	CP 80-1743
1998	48.9	CP 80-1827	CP 72-2086	CP 80-1743
1999	46.4	CP 80-1743	CP 72-2086	CP 80-1827
2000	46.2	CP 80-1743	CP 72-2086	CP 80-1827
2001	50.6	CP 80-1743	CP 72-2086	CP 78-1628
2002	50.5	CP 80-1743	CP 78-1628	CP 72-2086
2003	52.4	CP 80-1743	CP 78-1628	CP 88-1762
2004	61.1	CP 80-1743	CP 89-2143	CP 88-1762