

Sugarcane Variety Census: Florida 2005¹

B. Glaz and R. A. Gilbert²

This report was first published in the July, 2006 issue of *Sugar Journal*.

This annual variety census of the Florida sugarcane industry for the 2005-2006 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 or 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 404,592 acres of sugarcane were reported for sugar and seed production for the 2005-2006 crop. This represents an increase of 16,546 acres compared with the 388,046 acres grown in the 2004-2005 season (Glaz and Vonderwell, 2005). Last year, sugarcane area in Florida had declined by 51,471 acres. Florida's sugarcane acres increased from about 300,000 to 425,000 from 1976 through 1987. Although there have been some fluctuations since 1987, Florida sugarcane acreage

has generally been near 450,000 until the declines of recent years. These declines in sugarcane acreage resulted primarily 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 29.8 percent and ratoon cane 70.2 percent of Florida's 2005-2006 sugarcane crop. This compares with percentages of 32.8 for plant cane and 67.2 for ratoon cane reported last year (Glaz and Vonderwell, 2005). Poor seed-cane quality after Hurricanes Frances and Jeanne in 2004 and the perceived need to reduce acreage due to marketing allotments caused this decrease in plant-cane acreage. The distribution of ratoon cane was 30.3 percent as first ratoon, 27.2 percent second ratoon, 9.0 percent third ratoon, and 3.7 percent as fourth ratoon or older of the total acreage reported this year. These compared with 2004-2005 percentages of 31.1, 24.5, 7.5, and 4.1, respectively. There were more fluctuations of annual percentages in plant cane through fourth ratoon from 2004 to 2005 than from 2003 to 2004.

1. This document is SS AGR 268, a publication of the Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published June 2007. This publication is also a part of the Florida Sugarcane Handbook, an electronic publication of the Agronomy Department. For more information you may contact the editor of the Sugarcane Handbook, R. A. Gilbert (ragilbert@ifas.ufl.edu). Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

2. B. Glaz, research agronomist, USDA-ARS Sugarcane Field Station, Canal Point, FL; R. A. Gilbert, associate professor, Agronomy Department, Everglades Research and Education Center--Belle Glade, FL; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

Florida growers reported growing 28 sugarcane varieties this year. Last year, 64 varieties were reported. This reduction is because many varieties with small acreages last year were grouped into the "all other" category this year. Eight 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. The United States Sugar Corp. of Clewiston, Florida recently discontinued its variety development program that developed varieties identified by a "CL" prefix. A cooperative program based at Canal Point, Florida developed 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. participated in this 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 (Deren et al., 1991) with 28.6 percent of the total cane area (Table 1). This is the seventh consecutive year that CP 80-1743 was the most widely grown variety, but its first year with a reduction in acreage (Table 2). This drop of 4.4 percent follows last year's increase of 4.3 percent in acreage for CP 80-1743. Last year, the decrease of 3.6 percent in plant-cane acreage for CP 80-1743 was the largest decrease in plant cane of all of Florida's principal varieties (Glaz and Vonderwell, 2005). This year, the 10.2 percentage reduction in plant-cane acreage for CP 80-1743 was by far the largest decline in plant-cane acreage among principal varieties (Table 3). The primary cause of this drop in plant-cane acreage was that buds of CP 80-1743 sustained more damage than buds of other varieties as a result of Hurricanes Frances and Jeanne. CP 80-1743 has high yields of tonnage and sugar concentration and good ratoon yields; it comprised 48.3 percent of Florida's sugarcane in fourth ratoon and older (Table 1). However, Florida growers learned that, in addition to damaged buds, CP 80-1743 yields were substantially reduced by the high winds associated with the two hurricanes in 2004. 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 often schedule harvests of CP 80-1743 for no later than January and prioritize harvesting their remaining fields of CP 80-1743 after severe freezes as recommended by Gilbert et al. (2004). With 11.6 percent of the acreage, CP 80-1743 was also the second most widely grown variety on sand soils this year (Table 4).

Last year, CP 89-2143 (Glaz et al., 2000) was in second place with 14.9 percent of the total Florida sugarcane acreage (Glaz and Vonderwell, 2005). This year, CP 89-2143 had its largest annual acreage increase and finished in second place with 20.0 percent of the total acreage (Table 2); and with 6.0 percent of the acreage, CP 89-2143 was the fourth most widely grown variety on sand soils (Table 4). The increased use of CP 89-2143 by 5.1 percent was the largest increase of any principal variety and follows last year's 4.2 percent increase in acreage for CP 89-2143 (Table 3). Florida growers noted that buds of CP 89-2143 tolerated the 2004 hurricanes well. This partially explains the increase in CP 89-2143 plant-cane acres of 11.1 percent, the largest percentage plant-cane increase among principal varieties this year (Table 3). CP 89-2143 has excellent cane yields and maintains a high sugar concentration throughout the harvest season (Gilbert et al., 2004). In addition, Shine, Jr. et al. (2002) reported that CP 89-2143 had outstanding freeze tolerance. CP 89-2143 is used as one of three reference varieties in the CP variety development program (Glaz et al., 2005).

CP 88-1762 (Tai, et al., 1997) was the third-place variety for the third consecutive year, with 15.0 percent of the total acreage (Tables 1 and 2). This year also is the third consecutive year that the increase in overall acreage for CP 88-1762 has been 1.8 percent (Table 2). Gilbert et al. (2004) recommended harvesting CP 88-1762 early in the harvest season.

CP 78-1628 (Tai et al., 1991) was in fourth place for the second consecutive year this year following two years as the second place variety (Tables 1 and 2). CP 78-1628 comprised 12.7 percent of the total

acreage, an increase of 1.3 percent compared with last year. This year's increase for CP 78-1628 follows 0.4 percent reductions the previous two years (Table 2). CP 78-1628 has been the most widely grown variety on sand soils in Florida for the past seven years where its use declined from 43.6 percent last year to 40.6 percent this year (Glaz and Vonderwell, 2005 and Table 4). In recent years, sugarcane rust has become a recognizable problem for CP 78-1628. Gilbert et al. (2004) recommended harvesting CP 78-1628 in the middle portion of the harvest season for optimum sugar yields. CP 78-1628 is used as a reference variety in the CP variety development program (Glaz et al., 2005).

CP 72-2086 (Miller et al., 1984) 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 6.3 percent of the acreage, CP 72-2086 was in fifth place for the third consecutive year. Sugarcane mosaic was discovered in Florida on CP 72-2086 in 1996, the year of its highest percentage acreage (Table 2). 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 CP cooperative variety development program (Glaz et al., 2005).

With 4.4 percent of the total acreage, CP 84-1198 (Glaz, et al., 1994) was the sixth-place variety, for the fifth consecutive year (Table 1). Since 2000, CP 84-1198 acreage has also been relatively constant in percent use; staying between 3.8 and 5.1 percent of Florida's total sugarcane acreage (Table 2). However, CP 84-1198 had the largest reduction (3.7 percent) in ratoon-cane acreage among this year's principal varieties (Table 3). Growers report that, to avoid unacceptable reductions in ratoon yields, CP 84-1198 needs special attention during its mechanical harvest. Similarly, stalks cut mechanically and used for planting often have more damaged buds than other varieties. Advantages of CP 84-1198 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. With 10 percent of the acreage, CP 84-1198 was the third

most widely grown variety on sand soils in Florida (Table 4).

For the third consecutive year, CL 77-797 was the seventh most widely grown sugarcane variety in Florida with 2.1 percent of the 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). Its decline by 1.2 percent of the combined plant and ratoon cane this year follows a decline of 1.5 percent last year (Table 2). CL77-797 is a later maturing variety with good tolerance to post-freeze deterioration.

CP 73-1547 (Miller et al., 1982) was the eighth most widely grown variety for the third consecutive year with 1.3 percent of the total cane area (Table 1). Although its decrease in acreage was only 0.3 percent, CP 73-1547 continued its decline in percent acreage that began in 1997 (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 dropped from second to fifth place on sand soils this year with 5.9 percent of the sand acreage compared with 8.6 percent last year (Glaz and Vonderwell, 2005 and Table 4).

Among the varieties grouped as "all others," CL 69-886, CP 72-1210, CP 85-1382, CP 85-1432, CP 92-1213, CP 92-1641, CP 94-1100, and CP 94-1340 had no acres as plant cane this year. The absence of plant cane for a variety suggests that its commercial use may soon stop. Commercial varieties used previously in Florida and not reported in the census for the first time this year were CP 70-1527, CP 85-1308, CP 89-1509, and CP 92-1167.

Florida sugarcane growers classified 78.4 percent of their soils as organic and 21.6 percent as sand (Table 4). These percentages compare with 83.7 percent for organic and 16.3 percent for sand soils reported last year (Glaz and Vonderwell, 2005).

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.

Although five of the eight principal varieties, CP 80-1743, CP 89-2143, CP 88-1762, CP 78-1628, and CP 84-1198, were grown on at least 3,000 acres of both soil types, growers had variety preferences according to soil (Table 4). Among principal varieties, CP 84-1198 had the most even distribution between sand and organic soils. CP 72-2086 was grown almost exclusively on organic soils; and CP 73-1547 was used primarily on sand soils. CP 80-1743, CP 89-2143, CP 88-1762, and CL 77-797 were used widely on sand soils, but more than 85 percent of the acreage of each was on organic soils. CP 78-1628, the most popular variety on sand soils (40.6 percent), was also the fifth most widely grown variety on organic soils.

All plant-cane acres were categorized as planted in a "regular" or "successive" planting system. In the regular system, growers do not plant sugarcane until the planting season following a final-ratoon harvest. Growers may leave this land fallow, but 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 120,455 plant-cane acres classified by planting system, 75,169 (62.4 percent) were planted in the regular system and 45,286 (37.6 percent) were planted in the successive system (Table 5). These figures denote a continued shift to regular planting that began last year when 55.1 percent of the acreage was planted in the regular system and 44.9 percent was planted in the successive system (Glaz and Vonderwell, 2005). Since 1996, there have been several shifts between the regular and successive planting systems.

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 and CP 72-2086 had substantial acreages in both planting systems, but their acreages in the regular system were nearly three (CP 78-1628) and two (CP 72-2086) times more than in the successive system. CP 84-1198, CL 77-797, and CP 73-1547 were predominantly planted in the regular system.

Florida growers have been evaluating the effectiveness of mechanical planting systems in recent years. This year, growers provided data from 63.8 percent (76,888 acres) of the total 120,455 plant-cane acres to quantify the percentage use of manual versus mechanical planting (Table 6). Manual planting was used on 95.6 percent and mechanical planting on 4.4 percent of these reported acres. Last year when 94.5 percent of the total plant-cane acreage was reported as manually or mechanically planted, 56 percent was planted manually and 46 percent was planted mechanically (Glaz and Vonderwell, 2005). It is not clear from this year's data whether there has been a substantial decrease in mechanical planting or whether planting system was not reported on the acres that were previously reported as planted mechanically. The 2004 hurricanes may have also reduced the effectiveness of mechanical planting. CP 73-1547 was the only variety that was planted more in a mechanical than a manual system. CP 73-1547 was planted mostly on sand soils where much of Florida's mechanical sugarcane planting is done. CP 78-1628 and CP 80-1743 had substantial acreages planted in the mechanical system, but far more planted manually. The other principal varieties were almost exclusively planted in a manual system.

The three most widely grown varieties (CP 80-1743, CP 89-2143, and CP 88-1762) accounted for 63.6 percent of Florida's 2005 sugarcane, a moderate increase compared with the 61.1 percent reported last year (Table 7). The 63.6 percent of the acreage planted to the top three varieties for this year is the highest percentage of this 10-year reporting period, and the second highest, 61.1 percent, was reported last year (Table 7). This was the ninth consecutive year that CP 80-1743 was among the three most widely grown sugarcane varieties in Florida, the third consecutive year for CP 88-1762, and the second consecutive year for CP 89-2143.

Acknowledgments

The author gratefully acknowledges the assistance of Manuel del Valle, Chen-Jian Hu, Mercy Langdale, Larry Pate, Gerald Powell, Phyllis Pursell, Maria A. Sanjurjo, James M. Shine, Jr., Modesto F. Ulloa, and others who helped with this census.

References

- Deren, C.W., B. Glaz, P.Y.P. Tai, J.D. Miller, and J.M. Shine, Jr. 1991. Registration of 'CP 80-1743' sugarcane. *Crop Science* 31:235-236.
- Gilbert, R.A., J.M. Shine, Jr., J.D. Miller, and R.W. Rice. 2004. Sucrose accumulation and harvest schedule recommendations for CP sugarcane cultivars. Online at <http://www.plantmanagementnetwork.org/sub/cm/research/2004/sugarcane/>. *Crop Management* doi:10.1094/CM-2004-0402-01-RS.
- Glaz, B. 1995. Sugarcane variety census: Florida 1994. *Sugar y Azucar* 90(1):30, 31, 33-36.
- Glaz, B., J.C. Comstock, P.Y.P. Tai, S.J. Edme, R. Gilbert, J.D. Miller, and J.O. Davidson. 2005. Evaluation of new Canal Point sugarcane clones - 2003-2004 harvest season. USDA, ARS, ARS-165, 32 pp.
- Glaz, B., S.J. Edme, J.D. Miller, S.B. Milligan, and D.G. Holder. 2002. Sugarcane cultivar response to high summer water tables in the Everglades. *Agronomy Journal* 94:624-629.
- Glaz, B., J.D. Miller, C.W. Deren, P.Y.P. Tai, J.M. Shine, Jr., and J.C. Comstock. 2000. Registration of CP 89-2143' sugarcane. *Crop Science* 40:577.
- Glaz, B., J.M. Shine, Jr., C.W. Deren, P.Y.P. Tai, J.D. Miller, and J.C. Comstock. 1994. Registration of 'CP 84-1198' sugarcane. *Crop Science* 34:1404-1405.
- Glaz, B., and J. Vonderwell. 2005. Sugarcane variety census: Florida 2004. *Sugar Journal* 68(2):12-22.
- Miller, J. D., J. L. Dean, P. Y. P. Tai, E. R. Rice, and B. Glaz. 1982. Registration of CP 73-1547 sugarcane. *Crop Science* 22:689.
- Miller, J. D., P. Y. P. Tai, B. Glaz, J. L. Dean, and M. S. Kang. 1984. Registration of CP 72-2086 sugarcane. *Crop Science*. 24:210.
- Shine, Jr., J.M., R.A. Gilbert, and J.D. Miller. 2002. Post-freeze performance of 16 sugarcane cultivars following the December 31, 2000 freeze event in Florida. *Journal American Society of Sugar Cane Technologists* 22:122.
- Tai, P.Y.P., J.D. Miller, B. Glaz, C.W. Deren, and J.M. Shine, Jr. 1991. Registration of 'CP 78-1628' sugarcane. *Crop Science* 31:236.
- Tai, P.Y.P., J.M. Shine, Jr., C.W. Deren, B. Glaz, J.D. Miller, and J.C. Comstock. 1997. Registration of CP 88-1762' Sugarcane. *Crop Science* 37:1388.

Table 1. Percentages of 2005 Florida sugarcane planted to eight varieties that comprised at least one percent of the total acreage.

Variety	Total cane grown	Plant cane	First-ratoon cane	Second-ratoon cane	Third-ratoon cane	Fourth-ratoon cane & older
Percent						
CP 80-1743	28.6	19.7	28.1	34.4	33.2	48.3
CP 89-2143	20.0	29.2	18.5	14.7	17.6	4.2
CP 88-1762	15.0	17.4	15.3	13.0	14.1	11.5
CP 78-1628	12.7	14.4	14.1	9.9	12.4	9.7
CP 72-2086	6.3	5.7	6.7	8.2	3.4	1.0
CP 84-1198	4.4	4.1	5.4	4.8	2.0	1.7
CL 77-797	2.1	0.8	2.5	3.0	2.2	2.1
CP 73-1547	1.3	0.7	1.3	1.5	1.4	5.8
All others	9.6	8.0	8.2	10.5	13.6	15.7
Total acres	404,592	120,455	122,523	110,106	36,315	15,193

Table 2. Annual percentages from 1996 through 2005 for eight varieties that comprised at least one percent of Florida's 2005 sugarcane acreage.

Variety	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
CP 80-1743	10.7	12.0	14.4	17.8	22.1	25.1	26.5	28.7	33.0	28.6
CP 89-2143	0.0	0.0	0.1	0.4	1.2	3.5	7.4	10.7	14.9	20.0
CP 88-1762	0.0	0.2	0.8	2.0	4.1	6.2	8.6	11.4	13.2	15.0
CP 78-1628	2.6	5.0	5.9	7.9	9.3	11.5	12.7	12.3	11.4	12.7
CP 72-2086	18.0	17.1	16.3	14.6	14.2	13.8	11.3	9.1	8.0	6.3
CP 84-1198	1.0	1.5	2.2	2.9	3.8	4.8	5.1	4.8	4.8	4.4
CL 77-797	3.7	4.7	5.7	5.9	6.3	6.1	5.3	4.8	3.3	2.1
CP 73-1547	7.8	7.8	6.7	5.4	4.1	3.3	2.8	2.3	1.6	1.3

Table 3. Percentages of 2004 and 2005 acreages for eight varieties that comprised at least one percent of Florida's 2005 sugarcane acreage.

Variety	Combined plant and ratoon cane			Plant cane only			Ratoon cane only		
	2004	2005	Change	2004	2005	Change	2004	2005	Change
CP 80-1743	33.0	28.6	-4.4	29.9	19.7	-10.2	34.6	32.3	-2.3
CP 89-2143	14.9	20.0	5.1	18.1	29.2	11.1	13.3	16.1	2.8
CP 88-1762	13.2	15.0	1.8	14.4	17.4	3.0	12.6	14.0	1.4
CP 78-1628	11.4	12.7	1.3	12.8	14.4	1.6	10.7	12.0	1.3
CP 72-2086	8.0	6.3	-1.7	7.4	5.7	-1.7	8.3	6.5	-1.8
CP 84-1198	4.8	4.4	-0.4	5.6	4.1	-1.5	4.4	0.7	-3.7
CL 77-797	3.3	2.1	-1.2	3.2	0.8	-2.4	3.3	2.6	-0.7
CP 73-1547	1.6	1.3	-0.3	1.3	0.7	-0.6	1.7	1.6	-0.1

Table 4. Actual and percentage acreage grown on organic and sand soils of eight varieties that comprised at least one percent of Florida's 2005 sugarcane.

Variety	Organic Soil		Sand Soil	
	Acres	Percent	Acres	Percent
CP 80-1743	105,362	33.2	10,167	11.6
CP 89-2143	75,876	23.9	5,197	6.0
CP 88-1762	57,703	18.2	3,157	3.6
CP 78-1628	15,952	5.0	35,452	40.6
CP 72-2086	24,942	7.9	542	0.6
CP 84-1198	9,105	2.9	8,738	10.0
CL 77-797	7,229	2.3	1,224	1.4
CP 73-1547	118	0.0	5,152	5.9
All others	20,928	6.6	17,664	20.2
Total	317,216	100.0	87,293	100.0

Table 5. Actual and percentage acreage in regular and successive planting systems for eight varieties that comprised at least one percent of Florida's 2005 sugarcane.

Variety	Regular System		Successive System	
	Acres	Percent	Acres	Percent
CP 80-1743	13,321	17.7	10,455	23.1
CP 89-2143	19,744	26.3	15,459	34.1
CP 88-1762	11,684	15.5	9,276	20.5
CP 78-1628	12,722	16.9	4,592	10.1
CP 72-2086	4,240	5.6	2,634	5.8
CP 84-1198	4,311	5.7	669	1.5
CL 77-797	841	1.1	136	0.3
CP 73-1547	634	0.8	146	0.3
All others	7,672	10.2	1,919	4.2
Total	75,169	100.0	45,286	100.0

Table 6. Actual and percentage acreage in mechanical and manual planting systems for eight varieties that comprised at least one percent of Florida's 2005 sugarcane.

Variety	Mechanical System		Manual System	
	Acres	Percent	Acres	Percent
CP 80-1743	1,041	30.7	15,815	21.5
CP 89-2143	542	16.0	17,707	24.1
CP 88-1762	91	2.7	20,864	28.4
CP 78-1628	1,161	34.3	8,578	11.7
CP 72-2086	0	0.0	6,802	9.3
CP 84-1198	134	4.0	1,889	2.6
CL 77-797	0	0.0	122	0.2
CP 73-1547	355	10.5	31	0.0
All others	66	1.9	1,691	2.3
Total	3,389	100.0	73,499	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 1996.

Year	Variety Rank			
	Percent	First	Second	Third
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
2005	63.6	CP 80-1743	CP 89-2143	CP 88-1762