

The Economic Impact of Urbanization on the Florida Vegetable Industry

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Historically U.S. winter vegetable production has been supplied by Mexico and Florida. In recent years, Florida has seen a huge population growth due to its warm climate. The problem arises when urbanization begins encroaching on farm land that historically grows much of Florida's winter vegetables. It is not clear whether urbanization is causing agricultural land in Florida to diminish or just causing a shift in land use.

In 2003, the value of the Florida vegetable production was \$1,626,676,000¹. This figure shows that the Florida vegetable industry is a large contributor to Florida's economy. Harvested acreage, during the 2002-03 season of vegetables, berries and melons, including miscellaneous vegetables, totaled 284,600 acres.

Florida has also seen a large increase in population in recent years. The level terrain, availability of water for irrigation, and extended periods of warm weather, make these areas advantageous for vegetable production; and also make these areas attractive for population expansion². Florida farm land is forever being encroached upon by the sprawling cities and urban areas.

Harvested Acres

Over the last 10 years, Florida's vegetable industry has seen a 24 percent decrease in harvested acres from 1993-2003 (Table 1.) But the industry has seen a 4 percent increase in the value of production over the same time period (Table 2.) The decreases in harvested acreage are due in part to economic abandonment of crops due to natural disasters or lower market prices, but it is largely due to the

loss of some of the most valuable winter production land in Florida.

Florida's top vegetable producing counties are Palm Beach, Miami-Dade, Manatee and Collier Counties (Table 9.)³

Palm Beach County is one of the state's most valuable land areas for Florida winter vegetable production. Mainly because of the influences of the Gulf Stream, local ocean breezes and the water catchments areas to the west, of their growing regions, which are typically the warmest farmed areas of land in the continental United States during the months of October through May⁴. Palm Beach County ranks fifth in the state in regards to land in farms, with 535,965 acres in production in 2002.⁵ Palm Beach County ranks number one in value of vegetable production for the state, with a total of \$207,498,000 being made in 2002. The county is also ranked number one for the state in the number of vegetable acres harvested. The county has experienced a 14 percent decrease in agricultural acres used over the last 12 years (Table 3.)

Miami-Dade County ranks second in harvested acres of vegetable production for the state. In 2002, Miami-Dade County harvested 33,871 acres. They are ranked fourth in value of sales, earning \$102,592,000⁶, which is 7 percent of the state earnings in vegetables for the year.

Manatee County is ranked third in harvested acres. The county harvested 21,492 acres of vegetables in 2002. They rank second in value of sales with \$158,557,000⁷, which is 10 percent of the state's earnings in vegetables.

³ Florida Agricultural Statistical Directory

⁴ Information was taken from the Palm Beach County UF/IFAS Vegetable Extension Program website.

⁵ This is total land in agricultural use in Palm Beach County according to the Florida Agricultural Statistical Service.

⁶ Florida Agricultural Statistic Service.

⁷ Florida Agricultural Statistic Service.

¹ As reported in Florida Agricultural Facts (NASS) 2004

² Charles Barnard and Gary Lucier, "Urban Influences and the U.S. Vegetable Industry."

Manatee County experienced a 5 percent decrease in total cropland harvested from 1997-2002.

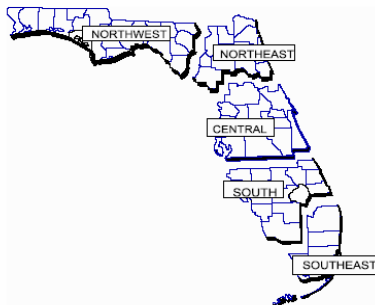
Collier County ranks fourth in harvested acres. In 2002, the county harvested 17,947 acres. Value of production was \$135,260,000⁸, which is 9 percent of the state's earnings in vegetables. Collier County experienced a 15 percent decrease in harvested acres from 1992-1997⁹.

Agricultural Land Values

The U.S. Department of Agriculture's annual estimates of farmland values indicated that the average value of agricultural land in the U.S. increased 4.6 percent from 2000 to 2001, while the average value of Florida farmland increased 7.1 percent. The reduction in supply of agricultural land, and continued demand increases the value and competition for alternative use¹⁰.

When determining agricultural land value changes in Florida, we will look at the "Florida Land Value Survey." In this survey, the state was divided into five distinct zones: Northwest, Northeast, Central, South and Southeast (Table 4).¹¹

Table 4



The value of agricultural land, according to the survey, increased in all regions for 2003. The value of cropland increased from 5 to 11 percent during 2002-2003 (Table 5.) The lowest agricultural land values were recorded in the Northwest region.

⁸ Florida Agricultural Statistics Service.

⁹ Data was taken from the "Florida Statistical Abstract 2003 and 1999"

¹⁰ John E. Reynolds & Hector Dorbecker, "Section 4: Agricultural Land Values: Miami-Dade County."

¹¹ Survey was conducted by John E. Reynolds, Professor, Department of Food and Resource Economics, University of Florida.

Transition Land¹²

The Florida Land Survey defines transitional land as agricultural land that is being converted or likely to be converted to non-agricultural uses as sites for homes, subdivisions and commercial uses. Transitional land values were over three times higher in the Southeast region than in the other regions. The values for transitional land in the metropolitan counties in the other regions were two to three times as high as the value of transitional land in non-metropolitan counties (Table 6.)

The value of transitional land within five miles of a major city in metropolitan counties increased 12 to 13 percent in the northern areas and 13 to 18 percent in the southern areas. The value of transitional land within five miles of a major city ranged from \$13,167 to \$16,392 per acre, except in the Southeast region where transition land values were \$58,813 per acre.

The value of transitional land more than five miles from a major city in metropolitan counties ranged from \$7,000 to \$10,388 per acre, except in the Southeast region where transitional land values were \$31,786 per acre. The value of transitional land within five miles of a major city in non-metropolitan counties ranged from \$4,312 to \$6,500 per acre. While transitional land values more than five miles from a major city, in non-metropolitan counties ranged from \$3,475 to \$4,375 per acre.

In Miami-Dade County, average sale price of row crop land increased 47 percent from 1990-2000 (Table 7.)¹³ Transitional land values in Miami-Dade County increased 37 percent for land less than five miles from a major city and 43 percent for those greater than five miles to a major city (Table 8)¹².

Chemical and Fertilizer Changes

With the growth of urban sprawl, come tighter restrictions and regulations for agriculture. From 1997 to 1992 the state of Florida saw a decline of 8 percent, in the amount of acres that used on (Table 10.)¹⁴ The counties with the greatest change in commercial fertilizer

¹² All information on transition land came from John E. Reynolds, "Agricultural Land Values Increase: 2003 Survey Results."

¹³ John E. Reynolds & Hector Dorbecker, "Section 4: Agricultural Land Values: Miami-Dade County."

¹⁴ Raw data was taken from the 1997 Census of Agriculture-County Data, USDA National Statistics Service

use were in the Southeast quadrant of the state. Palm Beach County had a decrease of 11 percent or 53,631 acres less of commercial fertilizer used from 1992 to 1997. Other counties with significant variations from the state average are Alachua, Collier and Glades Counties. Glades County had a decline of more than 55 percent in acres where commercial fertilizer was used, from 1992-1997.

The state also saw a 35 percent decline in chemicals used to control nematodes during the 1992-1997 time periods. Indian River, had a decline of 37 percent, Palm Beach County had a decline of 49 percent and Collier County had a decline of 67 percent in the amount of acres that chemical were used to control nematodes (Table 11.)¹⁵

During the period of 1992-1997, Florida as a 6 percent decline of acres that chemicals that control weed, grass or brush in crops and pastures were used. Alachua, Indian River and Palm Beach County all had a decline that is greater than the state average (Table 12.)

Most of the counties that strayed significantly away from the state average in the decline of chemical and fertilizer use were in the southeast quadrant of the state, the most heavily populated portions. Some of these reductions can be explained by tighter restrictions caused by urban areas, but more data analysis is needed to determine if data has a direct correlation with urbanization. It is possible to see that as restrictions are growing tighter for those areas near metropolitan cities vegetable production might be moving further north. Hardee County has seen a 5 percent increase in farmland acres from 1992-1997. They have also had a 9 percent increase in acres that commercial fertilizer are used, only a 1 percent decline in acres that chemicals used for nematodes and a 5 percent decline in acres that herbicides are used. All of these percentages are better than the state average (Table 10, 11, 12.)

Construction Permitted

In order to examine county growth, construction permits for specific counties were analyzed.

The number of construction permits for single family units has remained steady over the last five years. The only exception is a spike from 2001-2002 (Table 15.)¹⁶ Permits for most

of the counties in Florida have remained fairly constant over the last five years. The exceptions to this are the counties in Southeast Florida. Palm Beach and Miami-Dade have increased single family housing unit permits drastically from 2000 to present (Table 14.) Broward County has decreased its permits by 5,000 since the year 2000.

Conclusion

Does urbanization have a negative impact on Florida's vegetable industry? Can farmers compete with urbanization in Florida? Only time will answer that question. But for now we know that population growth promotes greater local demand for products, but at the same time it is limiting the supply of land and resources to produce for that demand. If we lived in a world where transportation technology is not what it is today, an increased local demand would be great for Florida farmers, even with limited land for production. The problem is that U.S. does have highly efficient transportation technologies that exclude this from being a benefit. In reality, urban sprawl from the many cities and towns in the state of Florida are encroaching on valuable vegetable production land, land that is needed to retain its position in the national market place. This paper has shown that not only are valuable vegetable production lands being urbanized but land that is surrounding urban areas is increasing in value for non-agricultural uses. With weak prices and constant competition from California, Texas, Arizona and countless foreign countries Florida farmers are pushing further north in order to stay ahead of urbanization. Urbanization has limited or in some cases restricted the use of chemicals and fertilizers in some areas. Even though relative to other agricultural products, many vegetables produce high returns per acre, creating a comparative advantage for vegetable production in urbanizing areas¹⁷. The industry and consumers must still be aware of the implications that urbanization has on Florida's vegetable industry. One day, Florida may lose its comparative advantage in the vegetable industry unless farmers seek new technology, such as protected agriculture, to stay competitive in a continually urbanizing and globalizing environment.

¹⁵ Raw data was taken from the 1997 Census of Agriculture-County Data, USDA National Statistics Service

¹⁶ All data is taken from the "Florida Statistical Abstract 2004"

¹⁷ Charles Barnard and Gary Lucier, "Urban Influence and the U.S. Vegetable Industry."

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Reynolds, John E. and Dorebecker, Hector "Section 4: Agriculture land Values: Miami-Dade County." Florida Food and Resource Economics, University of Florida 2002.

Tables

Table 1

Florida Vegetables, Watermelons, Potatoes, and Berries: Harvested acreage, crop years 1993-94 through 2002-03					
Crop year	Harvested acreage				
	Vegetables 1/	Watermelons	Potatoes	Berries	Total
	<i>Acres</i>				
1993-94	283,029	37,000	46,400	7,100	373,529
1994-95	274,900	33,000	42,900	7,300	358,100
1995-96	265,500	34,000	44,300	7,300	351,100
1996-97	231,200	30,000	42,100	7,300	310,600
1997-98	231,850	32,000	42,500	7,400	313,750
1998-99	221,100	35,000	37,300	7,400	300,800
1999-00	223,750	27,000	29,500	7,700	287,950
2000-01	220,100	24,000	30,000	8,000	282,100
2001-02	222,600	23,000	33,000	8,500	287,100
2002-03	217,200	24,000	34,400	9,000	284,600

Table 2

Florida Vegetables, Watermelons, Potatoes, and Berries: Value of production, crop years 1993-94 through 2002-03					
Crop year	Value of production				
	Vegetables 1/	Watermelons	Potatoes	Berries	Total
	<i>1,000 dollars</i>				
1993-94	1,277,218	57,868	118,655	107,115	1,560,856
1994-95	1,241,345	62,700	84,010	123,658	1,511,713
1995-96	1,212,979	49,980	126,165	117,597	1,506,721
1996-97	1,197,516	54,750	109,771	151,159	1,513,196
1997-98	1,367,185	60,120	128,329	167,440	1,723,074
1998-99	1,228,997	72,450	126,220	157,675	1,585,342
1999-00	1,229,123	45,360	87,679	179,505	1,541,667
2000-01	1,375,330	42,408	103,369	179,545	1,700,652
2001-02	1,196,381	62,238	134,705	172,032	1,565,356
2002-03	1,281,093	61,920	129,261	154,402	1,626,676

1/ Vegetable crops include snap beans, cabbage, sweet corn, cucumbers, eggplant, lettuce, peppers, squash, tomatoes, radishes, spinach, other fresh and processing vegetables, and cantaloupes.

Table 3

Palm Beach County's Agricultural Acreage

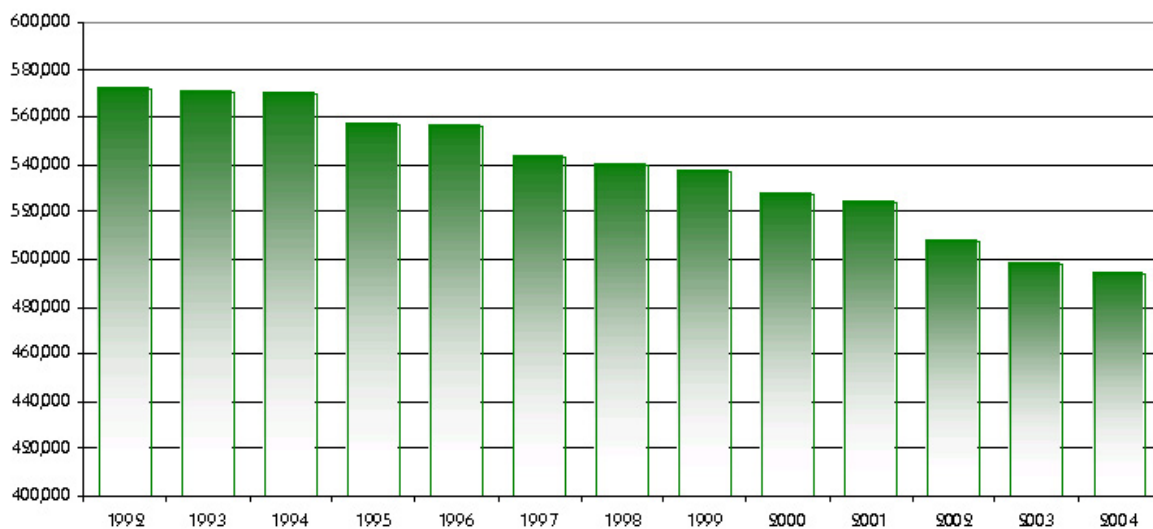
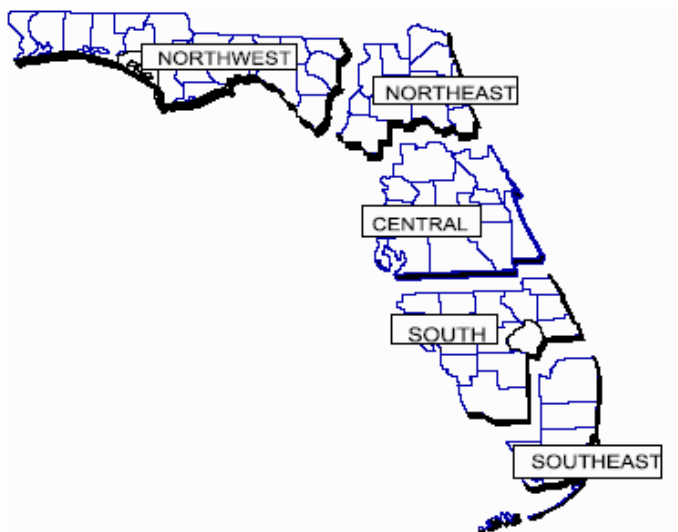


Table 4



Geographic regions used for the Florida Land Survey

Table 5
Estimated land value per acre, by geographic region
and land use, 2002 and 2003.

Region/Land Use	Date		Percent Change
	5/02	5/03	
	----- \$/acre -----		
SOUTH			
Mature Oranges	5,687	5,932	4.3
Mature Grapefruit	3,658	3,929	7.4
5-7 Yr. Citrus	5,211	5,440	4.4
Cropland			
Irrigated	2,314	2,475	6.9
Nonirrigated	1,843	2,014	9.3
Pastureland			
Improved	1,676	1,921	14.6
Unimproved	1,283	1,487	15.9
CENTRAL			
Mature Oranges	5,438	5,721	5.2
Mature Grapefruit	3,614	3,914	8.3
5-7 Yr. Citrus	4,668	4,889	4.7
Cropland			
Irrigated	2,807	2,998	6.8
Nonirrigated	2,468	2,597	5.2
Pastureland			
Improved	2,681	2,934	9.4
Unimproved	1,659	1,899	14.4
NORTHEAST			
Cropland			
Irrigated	2,859	3,148	10.1
Nonirrigated	2,171	2,366	8.9
Pastureland			
Improved	2,229	2,384	7.0
Unimproved	1,936	2,080	7.4
Farm Woods	1,726	1,847	7.0
NORTHWEST			
Cropland			
Irrigated	1,813	1,986	9.5
Nonirrigated	1,502	1,665	10.9
Pastureland			
Improved	1,411	1,542	9.2
Unimproved	1,165	1,294	11.1
Farm Woods	1,134	1,244	9.7

“Florida Land Value Survey,” Food and Resource Economics
Department, University of Florida, May 2003.

Table 6**Estimated value of transition land by geographic region, May 2003.**

Region/Category	Date		Percent Change
	5/02	5/03	
	----- \$/acre -----		
Metropolitan Counties			
< 5 Miles to Major Town			
Northwest	11,646	13,167	13.0
Northeast	13,833	15,500	12.1
Central	14,134	16,029	13.4
South	13,873	16,392	18.2
Southeast	45,083	58,813	17.1
> 5 Miles to Major Town			
Northwest	6,280	7,000	11.5
Northeast	7,500	7,813	4.2
Central	8,923	10,388	16.4
South	6,464	8,364	29.4
Southeast	28,333	31,786	12.2
Non-metropolitan Counties			
< 5 Miles to Major Town			
Northwest	4,107	4,312	5.0
Northeast	5,145	5,400	5.0
Central	***	***	***
South	5,931	6,500	9.6
> 5 Miles to Major Town			
Northwest	3,234	3,475	7.5
Northeast	3,830	4,088	6.7
Central	***	***	***
South	3,950	4,375	10.8

“Florida Land Value Survey,” Food and Resource Economics Department, University of Florida, May 2003.

Table 7 Average Sales Price of Row Crop Land, 1990-2000, Dade County, Florida.

Year	Number of Observations	Average Sales Price (\$/Ac.)
1990	5	9,000.00
1991	3	10,004.29
1992	5	13,780.46
1993	12	14,158.26
1994	8	14,325.06
1995	11	16,336.40
1996	17	19,239.40
1997	13	17,154.30
1998	22	15,773.40
1999	2	16,000.00
2000	9	16,843.27

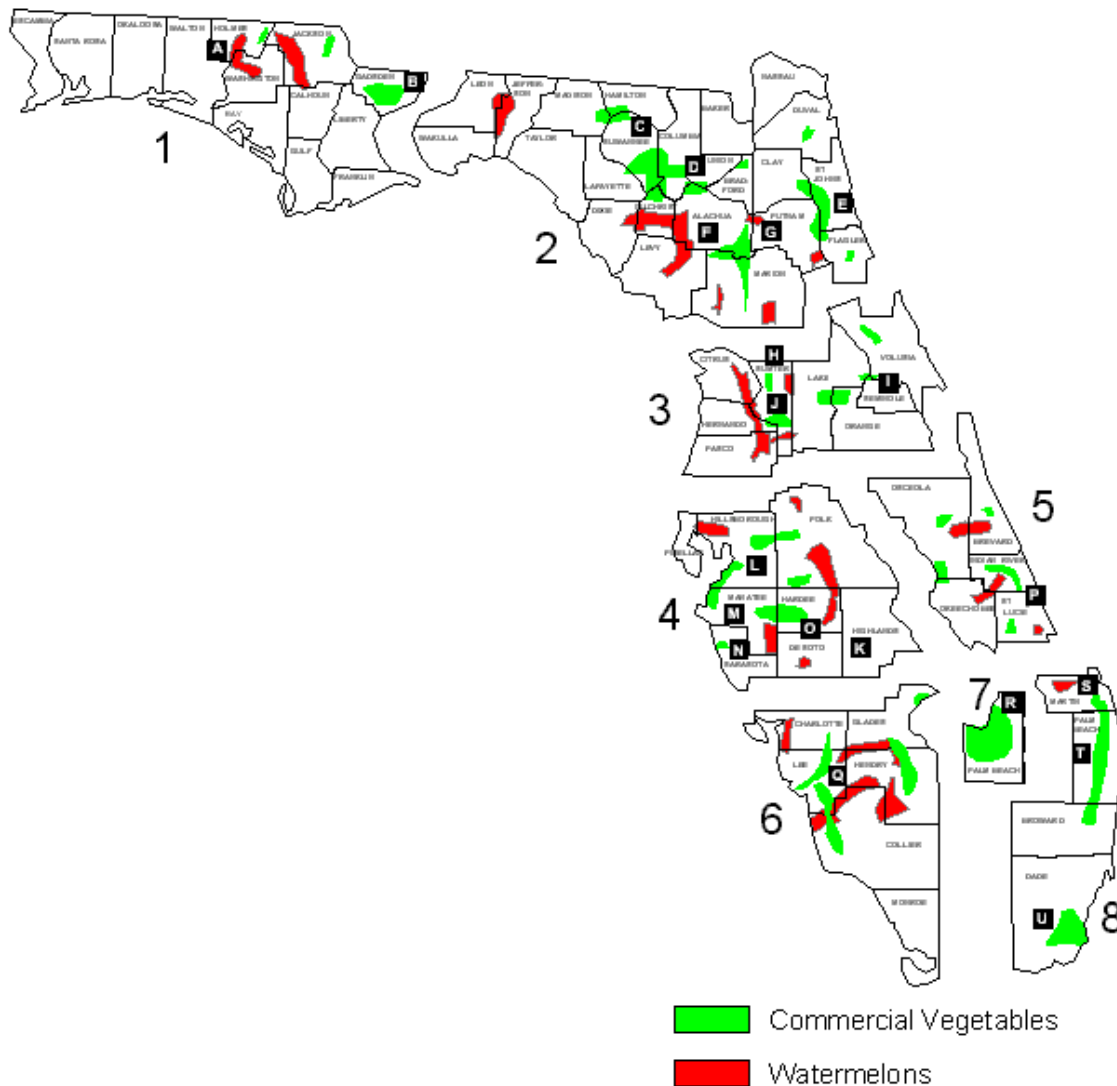
*John E. Reynolds & Hector Dorbecker, "Section 4 Agricultural Land Values in Miami-Dade County"

Table 8 Transition Land Values, Southeast, 1994 to 2001.

Year	<5 miles to Major Town	>5 miles to Major Town
	(\$/acre)	(\$/acre)
1994	25,166	15,000
1995	28,500	16,200
1996	30,167	17,375
1997	28,400	19,000
1998	28,000	20,600
1999	32,063	21,953
2000	34,000	22,917
2001	40,000	26,250

*John E. Reynolds & Hector Dorbecker, "Section 4 Agricultural Land Values in Miami-Dade County"

Table 9



*Florida Agricultural Statistical Directory

1 - WEST

- A. Holmes-Jackson-Washington counties: Butter beans, field peas, watermelons.
- B. Gadsden County: Pole beans, squash, sweet corn, tomatoes.

2 - NORTH

- C. Suwannee Valley: Beans, corn, cucumbers, greens, peas, peppers, potatoes, squash, watermelons.
- D. Starke-Brooker-Lake Butler: Lima beans, snap beans, blueberries, cucumbers, peppers, squash, strawberries.
- E. Hastings: Cabbage, potatoes.
- F. Gainesville-Alachua: Blueberries, bush beans, cucumbers, peppers, potatoes, squash.
- G. Island Grove-Hawthorne: Blueberries, cucumbers, peppers, sweet corn, squash, watermelons.

3 - NORTH CENTRAL

- H. Oxford-Pedro: Tomatoes, watermelons.
- I. Sanford-Oviedo-Zellwood: Cabbage, chinese cabbage, sweet corn, cucumbers, greens, spinach.
- J. Webster: Cucumbers, eggplant, peppers.

4 - WEST CENTRAL

- K. Lake Placid: Sweet corn, radishes, lettuce, parsley, beets.
- L. Plant City-Balm: Blueberries, bush and pole beans, lima beans, cabbage, cucumbers, eggplant, field peas, greens, squash, strawberries, cherry tomatoes, watermelons.
- M. Palmetto-Ruskin: Cabbage, cauliflower, potatoes, strawberries, tomatoes, cherry tomatoes, plum tomatoes, watermelons.

N. Sarasota: Cabbage, celery, cucumbers, sweet corn, escarole, lettuce, radishes.

O. Wauchula: Blueberries, cucumbers, eggplant, peppers, tomatoes, watermelons, squash.

5 - EAST CENTRAL

P. Ft. Pierce: Tomatoes, watermelons, snap beans.

6 - SOUTHWEST

Q. Snap beans, sweet corn, cucumbers, eggplant, sweet and hot peppers, potatoes, squash, tomatoes, cherry tomatoes, plum tomatoes, watermelons.

7 - EVERGLADES

R. Bush beans, cabbage, celery, Chinese cabbage, sweet corn, escarole, greens, lettuce, radishes.

8 - SOUTHEAST

S. Martin County: Cabbage, potatoes, tomatoes, watermelons.

T. Pompano: Bush beans, lima beans, sweet corn, cucumbers, eggplant, sweet and hot peppers, squash, tomatoes, cherry tomatoes, plum tomatoes.

U. Homestead: Bush and pole beans, cabbage, sweet corn, eggplant, okra, pickles, potatoes, squash, strawberries, tomatoes, cherry tomatoes, plum tomatoes.

Table 10

Agricultural Chemicals Used, Including Fertilizer:1997 and 1992			
Commercial Fertilizer			
Year	1997	1992	
Counties	(acres)	(acres)	Percent Change
Florida	2,939,310	3,206,580	-8%
Alachua	35,594	41,277	-14%
Collier	57,947	76,640	-24%
Glades	34,978	77,091	-55%
Hardee	103,081	93,909	9%
Indian River	84,137	90,569	-7%
Manatee	74,166	77,573	-4%
Palm Beach	445,408	499,039	-11%
Dade	64,544	61,560	5%

Raw data taken from the 1997 Census of Agriculture-County Data, USDA National Statistics Service

Table 11

Agricultural Chemicals Used, Including Fertilizer:1997 and 1992			
Chemicals used on Nematodes			
Year	1997	1992	
Counties	(acres)	(acres)	Percent Change
Florida	285,104	436,835	-35%
Alachua	2,493	3,209	-22%
Collier	9,952	29,947	-67%
Glades	6,985	**	**
Hardee	7,535	7,625	-1%
Indian River	7,085	11,291	-37%
Manatee	21,434	25,243	-15%
Palm Beach	27,808	54,494	-49%

** No data available from source

Raw data taken from the 1997 Census of Agriculture-County Data, USDA National Statistics Service

Table 12

Agricultural Chemicals Used, Including Fertilizer:1997 and 1992			
Chemicals used to control weed, grass or brush in crops and pastures			
Year	1997	1992	
Counties	(acres)	(acres)	Percent Change
Florida	1,494,432	1,583,233	-6%
Alachua	10,392	8,495	-18%
Collier	42,278	42,249	0%
Glades	16,774	26,190	-36%
Hardee	40,728	43,052	-5%
Indian River	50,189	66,379	-24%
Manatee	57,456	39,920	30%
Palm Beach	306,297	358,951	-15%

Raw data taken from the 1997 Census of Agriculture-County Data, USDA National Statistics Service

Table 13

Construction Activity: Single Family Housing Units Permitted in the State and Counties of Florida					
County	Single Family Housing Units Permitted				
	2003	2002	2001	2000	1999
Florida	156,406	156,406	118,482	106,115	106,253
Alachua	1,177	1,023	1,063	1,072	1,179
Broward	3,880	5,704	8,296	9,148	8,574
Collier	3,376	4,173	3,878	4,065	3,765
Glades	33	22	30	24	29
Hardee	62	44	63	52	38
Indian River	1,778	1,442	1,218	1,214	1,103
Manatee	3,267	3,034	3,218	2,848	2,625
Miami-Dade	8,741	6,374	6,829	5,988	6,671
Palm Beach	10,915	9,159	7,577	6,756	6,417

*Florida Statistical Abstract 2004

Table 14

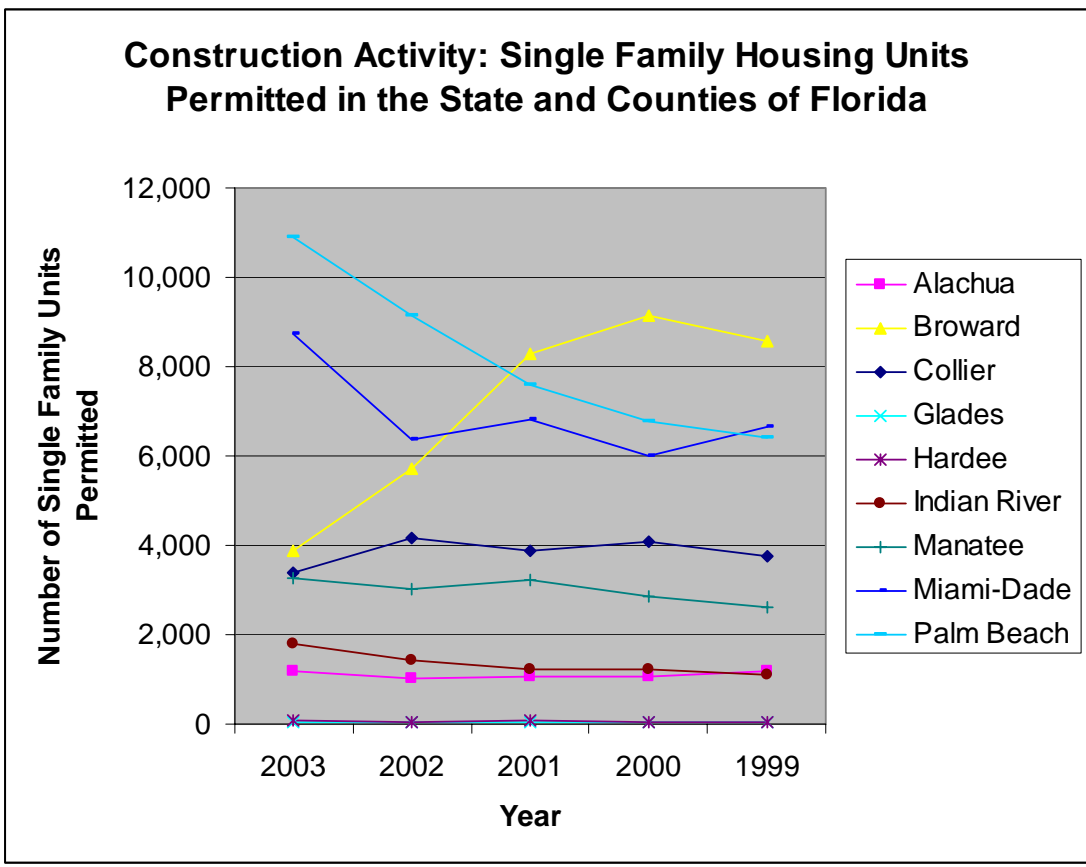


Table 15

