Summary and Conclusions

The total economic impact of agriculture on Dade County output was about $910 million in 1988-89, which generated over 23,000 full-time equivalent jobs and almost $300 million in income for workers in the county. Details on the contributions made by the major components of Dade County's agricultural subsectors, as well as interactions with other non-agricultural sectors, can be found in the final report, "Economic Impact of Agriculture and Agribusiness in Dade County, Florida," prepared by the Florida Agricultural Market Research Center, IFAS, at the University of Florida.

While the final results of an economic impact study may seem relatively simple and straightforward, a tremendous amount of effort is required to generate these results. The effort required is directly related to the diversity and complexity of agricultural production. In the absence of published data, it is virtually impossible to conduct an economic impact analysis where there are numerous unreported minor crops without the full cooperation of the agricultural community. The level of cooperation in Dade County was excellent, but in other areas, producers and shippers may be reluctant to provide confidential data. In conclusion, successful economic impact studies require full cooperation of the agricultural community in addition to time and resources to document agricultural economic activity.

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AN OVERVIEW OF ECONOMIC IMPACT ANALYSIS OF AGRICULTURE AND AGRIBUSINESS IN DADE COUNTY, FLORIDA

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Abstract. **An economic impact study of Dade County agriculture and agribusiness was conducted in 1989-90. This paper discusses the results of the Input-Output analysis used to determine the economic impact of the three agricultural subsectors: fruits, vegetables, and nurseries.**

Input-Output analysis showed agriculture's total output impact on Dade County was almost $1 billion in 1989. Of this output impact, vegetables contributed $511 million (56%), nurseries contributed $271 million (30%), and fruits contributed $127 million (14%). Total earnings impact of Dade agriculture in 1989 was almost $300 million. Vegetables constituted over 60% of earnings impact ($181 million); nurseries contributed over a quarter of the county agricultural income impact ($76 million); and fruits represented 13 percent, almost $40 million. Agricultural export sales (sales outside the county) generated more than 23,000 full-time equivalent jobs across all Dade County industries. Of this total, 14,117 jobs were generated from $281 million in external sales from the vegetable industry; 5,891 jobs were generated from $121 million in export sales from the nursery industry; and the fruit industry, with almost $65 million in external sales, generated 3,060 full-time equivalent jobs.

Objectives

The purpose of the study was to provide a more complete understanding of agriculture and agribusiness in Dade County and evaluate the importance of agricultural production and related activities to the county's economy. Specific objectives were to: (1) identify the major elements of agricultural production and agribusiness, (2) assemble available published and unpublished data for the major agricultural and agribusiness elements, (3) identify potential sources of primary economic data to supplement secondary data as necessary, (4) determine the aggregate economic impact of the agricultural sector and estimate economic interrelationships with other sectors of the county's economy, and (5) prepare descriptive profiles and specific estimates of economic impacts for individual sectors as resources permitted.

Data and Analysis

The elements of the agricultural and agribusiness industry were identified through personal interviews of individuals familiar with Dade County agriculture. Field work was conducted over a seven month period in Dade County in cooperation with the Dade County extension staff. The major focus was on row crops (including traditional and tropical vegetables), tree crops (tropical fruit), and ornamental horticulture.

Data for analyses were based on primary and secondary data and interviews with growers, shippers, extension personnel, and others familiar with Dade County agriculture. Data and information were collected from the *Census of Agriculture*, the Florida Agricultural Statistics Service, the Florida Department of Agriculture and Consumer Services, the Dade County chapter of the Florida Foliage Association, the Florida Lime and Avocado Administrative Committees, The Florida Tomato Committee, the Mango Forum, the Tropical Fruit Growers Association, and J. R. Brooks & Son Inc.

For the economic impact analysis, official 1989 estimates of individual commodity production values were used when available. However, due to the non-traditional nature of Dade County agriculture, there is reason to believe that estimates of the economic value of agriculture in the county are sometimes under-reported because only published data are used. Therefore, unofficial sources, including growers, shippers, and packers, were consulted to determine (a) values for those commodities for which there were no official estimates and (b) the proportion of each commodity shipped out of the county.

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General Findings

There are approximately 1.25 million acres of land in Dade County, with almost three quarters of this under water, in water conservation areas, or considered submarginal for urban or agricultural uses. According to U.S. Department of Commerce *Census of Agriculture*:
(1) Since the 1970s, physical land area devoted to agricultural production has remained relatively constant at approximately 6.6 percent of total county acreage. **(2)** Between census years 1974 and 1987, farmland acreage increased slightly, by about nine percent. However, during the same period, the number of farms increased by 86 percent, while the average farm size decreased from 88 acres to 51 acres. **(3)** In 1987, over half of all Dade County farms were nine acres or less in size. Fifteen percent were 50 acres or larger. **(4)** Between 1982 and 1987, there was nearly a 20 percent increase in vegetable acreage in the county. The value of vegetable production increased by nearly nine percent in the five year period between 1982 and 1987. **(5)** Acreage devoted to fruit production steadily increased, by over 65 percent, between census years 1974 and 1987. The value of fruits produced in Dade County increased by 8.5 percent between 1978 and 1987. **(6)** Commercial ornamental horticulture acreage increased by over 64 percent betwen 1982 and 1987. The value of nursery production during the same time period increased by over 70 percent. **(7)** Of the agricultural subsectors included in this study, census data showed that only field crops declined in terms of acreage and value of production. However, interim years, between census data collection, showed wide variation in field crops acreage and production value, according to Extension Service estimates.

There were at least 18 different traditional vegetables commercially grown in Dade County. During 1989, the estimated value of these traditional vegetables was $267 million of which approximately 98 percent was shipped out of the county. The four highest valued traditional vegetable commodities were tomatoes, bush beans, potatoes, and yellow squash.

More than 16 tropical and specialty vegetables, as well as a variety of herbs and spices are grown. The estimated value of tropical vegetables sold during 1989 was $26 million with an estimated 70 percent shipped to locations outside Dade County. Malanga, boniato, calabaza, and cassava constituted most of the tropical vegetable production.

Of approximately 15 commercially grown tropical fruits, the highest valued were limes, avocados, and mangos. Tropical fruit sales for 1989 were estimated at $74 million with approximately 88 percent shipped out of the county.

Due to the complexity and diversity of the commercial ornamental horticulture industry, a survey of nurseries in Dade County was conducted to determine the value of production and the proportion of sales destined to out-of-county clientele. Across all production systems, including container, field, and greenhouse, gross sales per acre were estimated to be about $28,000. Approximately $171 million of nursery products were sold during 1989. Over 70 percent of these sales were exported out of the county.

Economic Impact of Agriculture upon Dade County's Economy

The purpose of economic impact analysis is to help planners, analysts, and interested individuals estimate the total economic effect that a particular sector or industry has upon a region's output (gross sales), earnings (income), and employment. The agricultural sector of Dade County's economy "exports" commodities to locations *outside* of the *county*. These "exports," in turn, affect the county's economy by stimulating additional local economic activity, as dollars generated from sources outside Dade are used for purchases within the county.

When Dade's agricultural commodities are sold outside the county, the agricultural industry directly affects the region's economic activity by bringing new dollars into the county. These *direct* effects then produce *indirect* impacts or effects on the regional economy as dollars generated by external sales are used for local purchases. Indirect impacts, in the form of goods and services provided by local businesses and individuals to the agricultural sector, include any services that are provided to the agricultural industry, sale of inputs used by the agricultural sector, and sale of parts and repair services. These indirect effects represent additional economic activity and result in additional jobs and income for local residents, generated from external sales by the agricultural industry.

In addition to direct and indirect effects, there are also *induced* effects or impacts associated with the production of agricultural commodities. Induced effects represent the spending activities of employees who earn income in jobs provided by the businesses involved, either directly or indirectly, in the production of regional (agricultural) exports. This induced effect is income that is spent by consumers on purchases of services including such things as retail sales, local bank accounts, dry cleaning services, car repairs, and the like.

Thus, the economic impact that agriculture has upon Dade County's economy is the combined direct, indirect, and induced effects. For example, if for some reason agricultural "export" sales increase and local production expands, then the increase in sales represents new direct economic activity and increased local expenditures for labor and other agricultural inputs. This increased activity then triggers a chain of increased local spending by service and input supply industries as they increase their output and local purchases in order to supply increased demands of the agricultural sector. Each dollar of export sales, when spent locally, triggers a chain reaction of additional indirect and induced spending activities. This chain reaction is referred to as the *multiplier* effect. The multiplier for a particular export industry is a measure of the total economic activity (direct, indirect, and induced) associated with an additional dollar of external sales by the industry in question. A decrease in agricultural export sales in the county will have negative economic repercussions. The multiplier therefore can measure the impact of either an increase or a decrease in export sales activities. The means of estimating the economic impact that the agricultural sector has upon the county is through use of multipliers based on regional input-output (I-O) models. Because they are dollar multiples of the initial dollar spent for the output (sales) of the industry, total changes in output are referred to as *output multipliers*. *Earnings multipliers* for the agricultural industry in Dade County show the total earnings (direct, indirect, and induced) to households employed in Dade County industries in order for the agricultural sector to deliver a dollar of sales outside the county. The *employment multiplier*

for Dade County's agricultural industry shows the number of full time equivalent jobs that Dade County industries provide, directly, indirectly, and induced, in order for the agricultural sector to deliver $1 million of "export" sales.

For this study, Dade County's agricultural sector consists of three subsectors: (1) vegetable production, (2) fruit production, and (3) commercial ornamental horticulture. Multipliers for subsectors of Dade County's agricultural sector were estimated using the *Regional Input-Output Modeling System (RIMS II)* published by the Bureau of Economic Analysis of the U.S. Department of Commerce.

In order to estimate the impact that agricultural production had upon Dade County's economy during the 1988-89 production season, total gross sales were estimated for each of the three subsectors. For the purpose of dscribing the agricultural industry, vegetable production was disaggregated to include itemization of traditional vegetable and tropical vegetable production. However, for the impact analysis, vegetable production is aggregated into one subsector.

Since economic impact analysis estimates an industry's effect upon regional economic activity when products or commodities are *exported* from the region (county), it is the dollar amounts of total gross sales (for each subsector: vegetables, fruits, and commercial ornamental horticulture) shipped *out* of Dade County that are used.

Results

Input-output analysis showed sales of agricultural products contributed approximately $910 million to Dade County output, almost $300 million to the county's earnings (income), and generated over 23,000 full-time equivalent jobs. The vegetable industry contributed the most in terms of dollars and jobs, followed by the nursry industry and then the fruit industry.

Of the total $910 million economic impact on Dade County *output*, the vegetable industry contributed 56 percent or $511.4 million, the nursery industry contributed almost 30 percent or $271.18 million, and the fruit industry contributed 14 percent or $127.53 million of the total output. Each industry's percentage contribution to the total impact is similar for the other economic impact results. Agriculture's impact on Dade County *income* totaled almost $300 million in 1988-89, of which, approximately 61 percent of the economic impact on county earnings (income) was generated by the vegetable subsector ($181 million), 25 percent or $76.4 million by the nursery industry, and 13 percent or $39.6 by fruit production. A total of 23,069 full-time equivalent jobs (*employment* impact) were generated in all Dade County industries from agricultural export sales (sales outside the county) during the 1988-89 production season. Of this number of workers in jobs related, either directly or indirectly to or induced by, the agricultural sector, 61 percent or 14,117 jobs were generated by vegetable production, 25 percent or 5,891 jobs by nursery production, and 13 percent or 3,060 jobs by fruit production (Table 1). The final report, "Economic Impact of Agriculture and Agribusiness in Dade County, Florida," prepared by the Florida Agricultural Market Research Center, IFAS, at the University of Florida, contains details of contributions made by each of Dade County's agricultural subsectors and includes interactions with other non-agricultural sectors.

Table 1. Subsector contribution and economic impacts of agriculture on Dade County, 1989.

	Agricultural Subsectors			Total Ag Sector
	Fruits	Vegetables	Nurseries	
Total gross (FOB) export sales (million $)	64.9	280.7	120.9	466.4
Output				
Output impact (million $)	118.4	498.8	220.6	837.8
Sales within Dade County	9.1	12.6	50.6	72.3
Total output impact[b] (million $)	127.5	511.4	271.2	910.1
Percentage of Total Impact	14.0	56.2	29.8	100.0
Earnings				
Earnings impact[a] (million $)	39.6	181.2	76.4	297.2
Percentage of Impact	13.3	60.9	25.7	100.0
Employment				
Employment impact[a] (full-time job equivalents)	3,060	14,117	5,891	23,069
Percentage of Impact	13.3	61.2	25.5	100.0

[a]Impacts do not include employment and earnings associated with agricultural production for local sales.
[b]Total output impact is the output impact from export sales plus sales within Dade County.

Conclusions

Agriculture makes a significant contribution to the Dade County economy. Although the county is experiencing rapid urbanization, the value of agricultural production has continued to increase because of shifts to higher value, land intensive crops and more efficient production systems. Given the trends identified by this study, agriculture will remain a viable economic force in Dade County for the foreseeable future.