EXECUTIVE SUMMARY

I have completed a management review of the Center for Citrus Nutrition and Quality Research (CCNQR) formerly the scientific research center. The objectives of the review were to:

- Document the knowledge, skills and abilities needed to support the CCNQR as it relates to the mission of the Department of Citrus
- Document the knowledge, skills and abilities that are available with current staffing, both full time equivalents (FTE) and other personal service employees (OPS)
- Identify gaps that exist
- Prepare a flowchart of the component analysis processes and determine where additional efficiencies may exist
- Analyze the budget and staffing changes in recent years compared to overall DOC budget

To achieve these objectives, the review was conducted by a series of interviews with Department staff members and research industry representatives, a review of the CCNQR organization chart and staff biographies, a review of existing research planning documents, and an analysis of budgets, expenditures and staffing for the past six years.

This management review was planned and performed to obtain sufficient, appropriate evidence to provide a reasonable basis for the findings and conclusions based on the review objectives.¹ I believe that the evidence obtained provides a reasonable basis for these conclusions.

¹ The Inspector General of the Department of Citrus was the Comptroller through December 31, 2012, and may be perceived to have an impairment of independence because of this position. Therefore pursuant to the Memorandum of Understanding between the Commission and the Executive Office of the Governor, this review was performed with oversight by the Chief Inspector General’s office.
My review disclosed that CCNQR scientists have the expertise needed to conduct product sample analyses for the component analysis program; however, the resulting data bases are not utilized to the fullest potential because statistical analytics are not being applied to the data. There is not a formalized process to provide industry input to define the current needs of the Florida citrus industry in regards to citrus fruit and juice monitoring efforts. Due to the complex scientific nature of the program and the limited scope of this review, it could not be determined whether the current output provides appropriate levels of component analysis to support the mission of the Department.

Analysis of the data points with defined objectives could provide relevant information to the Florida citrus industry as production methods change to overcome threats to the citrus crop. I recommend that the Department of Citrus engage experts in the research and citrus industry to identify the elements of component analysis that would provide more value to the citrus industry and provide recommendations to determine the scope of sample analysis.

My review of CCNQR expenditures for the past six years indicates a gradual upward trend as the overall budgets/expenditures of the Department declined due to declining Florida citrus production. A federal grant during that period funded an expansion of the component analysis program to conduct a pilot program evaluating residue levels in Florida products. Equipment acquired with grant funds remains the property of the Department and CCNQR scientists continue to evaluate residue levels. The analysis recommended above would either support the increasing budgets or provide direction otherwise.

I appreciate the time and information that was provided by Department staff and other industry members to accomplish this management review.

Debra J. Funkhouser
Inspector General

C: Florida Citrus Commission
   Christine Marion, Comptroller
   Melinda Miguel, Chief Inspector General
   David Martin, Auditor General
   David Blanton, Section Audit Supervisor, Auditor General, Lakeland
Background

Chapter 601.13 provides broad authority for the Department of Citrus to conduct studies of citrus fruit and citrus juices with respect to quality and maturity, and with respect to nutritional and other values; to determine possible new and further uses for citrus fruit and juices and byproducts; and to conduct studies related to disease and crop efficiency. The focus of the scientific research center has evolved over the years to support the changing needs of the Florida citrus industry, with the current focus being on the evaluation of components in citrus and citrus products, the review of current marketing messages, and research in support of health and wellness messages for citrus and citrus products.

Current staffing of twelve full-time equivalents includes a research director, two administrative support staff members, three PhD research scientists, a chemical engineer, four chemists, and one lab technician. Temporary staff members include a part-time PhD research scientist and a full-time lab technician. Staff backgrounds include Chemistry and Biochemistry, Food Science and Technology, Plant Protection and Pathology, and Plant Physiology. Research scientists are responsible for overseeing the operation of one or more of five CCNQR laboratories, with the assistance of a chemist and/or lab technician. Each laboratory conducts different sample analyses to support varying aspects of the component evaluation program.

The Department contracts with the University of Florida to engage a registered dietician to act as a liaison with scientific and marketing teams. This work actively supports current marketing programs in the development of educational strategies to promote the positive health benefits of increased citrus consumption. In addition to assisting CCNQR with the review of all health materials included in advertising and public relations campaigns, the dietician staffs marketing/nutrition events annually and attends marketing strategic planning meetings.

We engage other medical research institutions to conduct human clinical studies to provide a body of evidence to validate the health benefits associated with consumption of orange and grapefruit products. The long-term goal of these efforts is to identify one or more unique health claims that can be utilized in advertising and promotional messages. Interim studies provide up-to-date information about the health benefits of Florida citrus that is used in various media channels by Department marketing teams.

Component Analysis Program

The component analysis program begins with a central collection point for product samples from various sources, from fresh citrus to finished products. A unique identifying number is assigned to each sample and a database record is created with source information and basic component information in a master database. Each sample is divided into smaller sample sizes and distributed to five labs where established protocols control the testing environment to ensure results are obtained following good laboratory practices. Each research scientist is responsible to monitor the equipment, sample preparation, standards and control runs, and to adjust protocols when conditions require. The results of each sample run are analyzed, compared to standards, and verified prior to uploading to the applicable database. See Exhibit 1 for flowchart of the product monitoring activities.

The number of samples analyzed over the past five fiscal years has grown from approximately 700 samples per year to 1,100 last year. Two years in that period included the federally funded study to
evaluate levels of residues found in fresh grapefruit destined for export to the European Union, and as such the samples increased to nearly 2,000 in fiscal year (FY) 2011-12, with 16,300 analyses performed in that year. Nearly 15,000 analyses were performed last fiscal year, which was triple the amount performed five years ago. The results of the analyses are compiled in two databases, a nutrition data report master and a residue data report master.

The review disclosed that master database records are analyzed periodically by the CCNQR director for potential product issues or in response to industry inquiries. CCNQR does not conduct advanced statistical analyses of the centralized databases. If further analysis were done, beneficial information may be realized that could support the Florida citrus industry as it adapts production practices to meet existing disease threats.

**Financial Analysis**

My analysis included a review of expenditures across all units of the Department for the past six years and a comparison to the preliminary operating budget for FY 2013-14. Total Department expenditures were between $51.0 and $53.1 million except for the most recent year FY 2012-13, when expenditures were $46.8 million. CCNQR general operations expenditures during the same period were between $1.25 million to $1.69 million. CCNQR applied for and received a federal grant which reimbursed $286,000 of these program costs over three years (FY 2011 - $155,000, FY 2012 – $105,794, and FY 2013 - $24,965) to support a residue analysis program, which became part of the component analysis program.

A comparison of the Department’s actual expenditures indicated a decline of $5.5 million, from $52.3 million in FY 2007-08 (three years before the component analysis program was expanded for the federally-funded residue analysis program) to $46.8 million in FY 2012-13. All of the Department’s business units experienced declines during this period except CCNQR, which expended $250,657 more in general operations in FY 2012-13 than in FY 2007-08. This increase was directly related to costs associated with staffing changes ($28,000), and procurement of research materials ($62,952) and equipment ($136,173) used in the component analysis program. Travel and other miscellaneous costs decreased to offset some of the increases.

The Department’s preliminary internal operating budget for FY 2013-14 totals $48.1 million, a $1.2 million increase over 2012-13 expenditures. The increase is allocated as follows: domestic marketing activities - $430,000; CCNQR - $330,000; medical research - $230,000; and economic research - $130,000. The budget increase to CCNQR funding will support the component analysis program at an increased level. Implementation of my recommendation to engage industry experts to provide input in determining the scope of this program will ensure that the Department allocates and expends these funds in a manner most effective for the industry.
New industry issues may require change in sample selection.

May be stored/frozen until needed.

Exhibit 1: Product Monitoring Flowchart.

- **Room 53/53A**
  - Receive Samples
    - local pickup
    - contracted vendor USDA
    - other
  - Process Samples
    - assign unique ID
    - verify label data
    - evaluate flavor
    - analyze brix, acid, oil, & naringin (GJ)
    - create DB record
  - Distribute Samples
    - 250 ml bottles for labs
    - quart stored/frozen

- **Room 47**
  - Nutrition/metal/rare earth elements

- **Room 54**
  - Furanoocoumarins (grapefruit drug interaction)
  - Flavor analysis GC/MS
  - Protein analysis

- **Room 56**
  - Flavor analysis GC/MS
  - Lab/Equipment Prep (CLE & HPLC)

- **Room 66**
  - Flavor analysis GC/MS
  - Lab/Equipment Prep (CLE & HPLC)

- **Room 80**
  - Flavor analysis GC/MS
  - Lab/Equipment Prep (CLE & HPLC)

- **Room 77**
  - Flavor analysis GC/MS
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