FLORIDA EXTENSION INITIATIVE 1:
AGRICULTURE/HORTICULTURE

STATEWIDE EDUCATIONAL PROGRAMS IN 1.3 PLANT SYSTEMS

SITUATION

The Plant System sub-priority group is comprised of county and state faculty members with programmatic activity with commercial agronomic, ornamental, and fruit and vegetable crops. Agricultural crops are a major contributor to the Florida economy, with many of our crops ranking in the top five nationally. In 2017 This needs to be updated to 2018, Florida had 47,000 commercial farms and ranches, representing a total of 9.45 million acres. Florida ranked first in the U.S. in value of production of cucumbers, grapefruit, oranges, squash, sugarcane, fresh market snap beans, fresh market tomatoes and numerous tropical fruits (i.e., avocado, mamey sapote, guava, longan, and pitaya). The state ranked second in value of production of bell peppers, strawberries, watermelons, fresh market cabbage, fresh market sweet corn and avocado. Florida also ranked fourth nationally in the value of peanut production and eighth in blueberry production.

Peanuts, cotton, corn and soybean were planted on almost 390,000 acres in 2018, with peanut accounting for 40% of the total state acreage. The average farm gate value of production during 2013-2017 was $52.4 million for cotton, $154 million for peanut, $24.7 million for corn and $4.2 million for soybean (National Agricultural Statistics Service, 2011). The extended economic impact is much greater. Florida sugarcane is grown almost exclusively on land along or near the southern half of Lake Okeechobee. The total planted area is approximately 400,000 acres, making sugarcane the most extensively grown agronomic row crop in Florida. About 50% of the cane sugar produced in the U.S. comes from Florida and this accounts for 14% of all sugar consumed (cane and beet) in the country. Annual cash receipts from the industry total $800 million, however when indirect and multiplier economic effects are taken into account, the Florida sugar industry contributes greater than $4.5 billion to the state economy and influences more than 47,000 jobs. The United States' organic sales are growing, in 2017 they reached nearly 50 billion dollars. Florida's organic agriculture production is also alive and thriving.

In 2017, Florida ranked second in the nation in the production of greenhouse, nursery and miscellaneous products with cash receipts totaling over $2.088 billion. Floriculture specifically is estimated to contribute over $1 billion of this total. This represents a decrease of approximately $40 million from 2016. (https://www.freshfromflorida.com/Agriculture-Industry/Florida-Agriculture-Overview-and-Statistics).

Florida accounted for 45% of the total U.S. citrus production with 78.1 million boxes of citrus in the 2016-2017 season, with Sales On-Tree Value of $780.7 million. Florida's orange production decreased 16% to 68.8 million boxes. All grapefruit production is down nearly 28% to 7.76 million boxes. Production of tangerines decreased from the previous season as well. There is

also significant acreage and revenue from other specialty crops including tropical fruits, blueberry and peach. Blueberry production and value was up 58% from 2016 to 2017.

Florida vegetables and melons were grown on 185,000 acres with a farm-gate value of $1.44 billion (USDA/NASS, 2012), ranking our state second nationally, behind California. The value of vegetable and melon crops is as follows: tomatoes (fresh market) $262 million, bell peppers $206 million, sweet corn (fresh market) $158 million, watermelons $136 million, cucumbers (processing) $97 million, cucumbers (fresh market) $76.3 million, snap bean $70.8 million, and cabbage (fresh market) $42 million.

However, although these industries contribute significantly to Florida's economy, our ranchers, growers, packers and shippers face increasing pressures that threaten their competitiveness. These pressures include but are not limited to: new plant pests, loss of soil fumigants, increased competition from domestic and off-shore production areas and increased regulations.

Therefore, our extension programs must focus on enhancing the sustainability, competitiveness and profitability of Florida's producers, handlers, shippers, processors and allied industries. By taking advantage of our integrated research and extension delivery programs, the latest Florida-centric information can be readily disseminated to clientele for evaluation and adoption. Essential components are:

1) to assist in the awareness and adoption of new crops and cultivars with economic potential, including bioenergy crops, emerging specialty crops, and improvements in conventional crops;
2) to provide options to maximize crop production through the proper use of irrigation, nutrients, and plant protectants via Best Management Practices, while protecting the natural resources of Florida;
3) to create awareness of cost-effective means to implement adequate food safety programs (See Food Systems sub-group) and appropriate methods and technologies during harvest and handling operations to help growers and handlers to reduce losses and reliably provide high-quality, safe crops to local and distant markets. Identifying and exploiting new uses of existing commodities or waste products will also add value to current production systems.

In order to successfully address the above critical needs, this sub-group will annually disseminate new information to growers via extension programming and will document increased knowledge, adoption rates and profitability. Collaborations with other sub-groups within Initiative 1 and other Initiatives is critical to the success of these programs, and our faculty typically have activity in and report to several Initiatives.

Agricultural products are produced on over 47,500 Florida farms; some are exceptionally large (1,000's of acres) while greater than 90% of these farms are termed "small" based on the USDA's definition. This diverse population of Florida agriculture producers requires a diversity of extension delivery methods– each tailored to reach the desired outcomes.

Program Objective (#1)

INFORM FLORIDA GROWERS ABOUT AND FACILITATE ADOPTION OF NEW CROPS AND VARIETIES WITH POTENTIAL FOR PRODUCTION UNDER FLORIDA'S RANGE OF MICROCLIMATES.

Type of outcome: Short-term, Medium-term, and Long-term

- **Educational methods**
    - Agent/Grower/Specialist interaction
    - Relevant and timely print and electronic media
    - In-Service Trainings (ISTs) for County Faculty
    - Field Days and On-farm Demonstrations
    - Digital tools (e.g., apps, social media, virtual field day videos and PowerPoint resources)
    - Workshops for agents, farmers/growers, regulatory agencies, and policy makers/shapers
    - Marketing campaigns
- **Topics covered**: New varieties of any horticultural crops including cultivar selection for organic production systems
- **Partners or collaborators**
    - USDA
    - FDACS
    - UF/IFAS breeders
    - Florida Organic Growers and Consumers
    - Working Food
    - Farmers, including small and organic farmers
    - Other relevant institutions
- **Target audience and/or underrepresented clientele**
    - Horticultural and agronomic growers
    - Women and minority groups
    - Small to medium-sized farms
    - Minority farmers, including women, African-American, Hispanic/Latino, immigrant, American Indian and small farmers and farmers with disabilities
    - Organic farms
- **Evaluation** methods:
    - **Survey instruments**
        - Number of growers reporting "new" knowledge and intention to test new crops
        - Number of growers trying new crops
        - Number of acres planted to new crops

- **Expected outcomes or sample statewide outcome statements:**
    - Short Term Outcomes: Increased understanding of the merits of new crops and/or new cultivars and how they impact market demand, production efficiency, and profitability.
    - Medium term: Producers select new crops and cultivars that will improve crop rotation, production efficiency, and profitability.
    - Long Term: Optimize sustainable production that results in higher economic returns while minimizing environmental impact.
- **Statewide impact statement(s):**
    - The impact will vary by the crop that is predominately grown in the specific area
- **Associated Workload indicator(s):**
    - Indicator ID 9, Number of farmers/ranchers who adopted a new crop variety
    - Indicator ID 31 Number of farmers who adopted a dedicated bioenergy crop

Program Objective (#2)

INFORM FLORIDA GROWERS ABOUT AND FACILITATE ADOPTION OF INNOVATIVE PRODUCTION PRACTICES CONSISTENT WITH PROFITABILITY AND ENVIRONMENTAL STEWARDSHIP.

Type of outcome: Short-term, Medium-term, and Long-term

- **Educational methods**
    - Agent/Grower/Specialist interaction
    - Relevant and timely print and electronic media
    - In-Service Trainings for County Faculty
    - Field Days and On-farm Demonstrations
    - Digital tools (e.g., apps, social media, virtual field day videos and PowerPoint resources)
    - Workshops for agents, growers, regulatory agencies, and policy makers/shapers
- **Topics covered**
    - Production/cultural practices
    - Sustainable water and nutrient management (BMPs)
    - Crop systems and systems approach
    - Cover crops, environmental stewardship
    - Tillage systems
    - Food safety training
    - Organic farming practices
    - Training, technical assistance, relevant education provided to farmers/producers that will assist them to avoid contamination (herbicide, pesticide, etc.) of their neighboring farmlands, neighboring conservation lands, and communities.
- **Partners or collaborators**

- USDA
- FDACS
- UF/IFAS and FAMU
- Community Collaborators
- Florida Organic Growers and Consumers
- Working Food
- UF/IFAS Communications; news and media

- **Target audience and/or underrepresented clientele**
  - Horticultural and agricultural growers
  - Minority farmers, including women, African-American, Hispanic/Latino, immigrant, American Indian and small farmers and farmers with disabilities
  - Organic farmers
- **Evaluation** methods:
  - **Survey instruments**
    - Number of growers with improved production practices knowledge
    - Number of growers trying improved production practices
    - Number of growers implementing improved production practices
    - Number of acres using improved production practices
    - Number of growers trained in food safety
- **Expected outcomes or sample statewide outcome statements:**
  - Short Term: Increased understanding of how current, innovative production practices impact profitability and environment.
  - Medium term: Increased grower adoption of new cultural practices for Florida crops to improve profitability and sustainability.
  - Long Term: Optimize sustainable production, harvest and handling practices that result in higher economic returns while minimizing environmental impact.
- **Statewide impact statement(s):**
  - Conventional production information for comparison for individual crops are on the EDIS website
  - Organic production information at USDA Agricultural Marketing website
  - Number of people with intention to adopt BMPs and food safety
  - Number of operations that have signed up to implement FDACS Water Quality/Quantity BMPs
  - Number of operations that have passed formal Produce Safety Training
  - Increase in the number of farmers/producers using strategies to avoid herbicide, pesticide, and fertilizer contamination of their neighboring farmlands, conservation lands, and communities, etc.
- **Associated Workload indicator(s) (if applicable)**

- Indicator ID 3 - Number of participants reporting new leadership roles or opportunities undertaken
- Indicator ID 4 - Number of producers indicating adoption of recommended practices, including Ag BMPs and Mobile Irrigation Lab (MIL)
- Indicator ID 5 - [If >0 in #4] Number of acres on which the recommended practices were implemented
- Indicator ID 6 - Number of producers reporting reduction in fertilizer or pesticide use
- Indicator ID 7 - Number of producers who changed to appropriate fertilizer and pesticide rates
- Indicator ID 8 - Number of producers reporting increased dollar returns or reduced costs
- Indicator ID 33 - Number of gallons of water saved by production program participants (e.g., producers, farmers, ranchers) for the entire year.
- Indicator ID 34 - Number of producers that adopted one or more "good" water conservation practices such as reduced irrigation and use of water-saving technologies
- Indicator ID 35 - Number of producers that adopted one or more "good" water quality practices such as reduced pesticides, animal waste or other pollutants
- Indicator ID 36 - Number of producers that adopted recommended best practices for production agriculture related to invasive species, pest management, pollutant loads, and wetlands
- Indicator ID 22 - Number of producers who have taken and passed the food safety training (Also under Initiative 1.1.2 Food Systems)
- Indicator ID 21 - Number of producers who have written a food safety plan. (Also under Initiative 1.1.2 Food Systems)
- Indicator ID ? - Number of producers who have implemented a food safety plan and passed an audit

Program Objective (#3)

INFORM FLORIDA GROWERS ABOUT AND FACILITATE ADOPTION OF NOVEL TECHNIQUES AND TECHNOLOGIES FOR PRODUCING, HARVESTING AND SHIPPING HIGH-QUALITY, SAFE CROPS.

Type of outcome: Short-term, Medium-term, and Long-term

- **Educational methods**
  - Agent/Grower/Specialist interaction
  - Relevant and timely print and electronic media
  - In-Service Trainings for County Faculty
  - Field Days and On-farm Demonstrations

- Digital tools (e.g., apps, social media, virtual field day videos and PowerPoint resources)
- Workshops for growers, regulatory agencies, and policy makers/shapers

- **Topics covered**
  - Drones
  - Frost protection, FAWN
  - Soil moisture sensors or ET-based irrigation management
  - Apps to manage irrigation
  - Production practices for organic production systems
  - Innovative harvest and handling technologies
- **Partners or collaborators**
  - FDACS
  - UF/IFAS faculty
  - Florida Organic Growers and Consumers
  - Working Food
  - USDA/ARS
- **Target audience and/or underrepresented clientele**
  - Horticultural and agricultural growers
  - Crop consultants
  - Women and minority growers
  - Minority farmers, including women, African-American, Hispanic/Latino, immigrant, American Indian and small farmers and farmers with disabilities
- **Evaluation** methods:
  - **Survey instruments**
    - Number of growers with increased knowledge of novel techniques and technologies for producing, harvesting and shipping high-quality, safe crops
    - Number of growers planning to try novel techniques and technologies for producing, harvesting and shipping high-quality, safe crops
    - Number of growers adopting novel techniques and technologies for producing, harvesting and shipping high-quality, safe crops
- **Expected outcomes or sample statewide outcome statements:**
  - Short Term: Increased awareness of techniques to scout, freeze protect plants, manage irrigation and nutrient applications, and proper harvest and handling procedures for improved quality and consumer safety.
  - Medium term: Grower adoption of one or more techniques and technologies that reduce losses, improve quality and increase consumer safety.
  - Long Term: Long Term: Optimize sustainable production practices for pest detection, freeze protection and irrigation/nutrient management, harvest and

handling practices that result in higher economic returns while minimizing environmental impact.

- **Statewide impact statement(s):**
- **Associated Workload indicator(s) (if applicable)**
    - Indicator ID 3 - Number of participants reporting new leadership roles or opportunities undertaken
    - Indicator ID 4 - Number of producers indicating adoption of recommended practices, including Ag BMPs, Mobile Irrigation Lab (MIL), food safety plans, and/or new scouting methods
    - Indicator ID 5 - [If >0 in #4] Number of acres on which the recommended practices were implemented
    - Indicator ID 6 - Number of producers reporting reduction in fertilizer or pesticide use
    - Indicator ID 7 - Number of producers who changed to appropriate fertilizer and pesticide rates
    - Indicator ID 22 – Number of producers who passed food safety training, wrote and implemented a food safety plan and/or passed a food safety audit
    - Indicator ID 8 - Number of producers reporting increased dollar returns or reduced costs

NEEDS

1) Develop website-based and multi-media digital platforms (apps for smart phones, tablets, etc.) for 24/7 access to information.
2) Improved funding opportunities for long-term, systems-approach, research.
3) Improved communication with associated researchers (irrigation specialists, IPM specialists, production specialists, food safety specialists, postharvest specialists, food processing specialists).
4) Applied Agriculture Economist to assist with budgets and feasibility models.
5) Develop closer partnerships with regulatory agencies.
6) Hiring multi-media specialists to work with faculty on internet and video productions.

REFERENCES

https://www.freshfromflorida.com/Agriculture-Industry/Florida-Agriculture-Overview-and-Statistics

RESOURCES