

FLORIDA EXTENSION INITIATIVE 1:
INCREASING THE SUSTAINABILITY, PROFITABILITY, AND COMPETITIVENESS OF AGRICULTURAL AND
HORTICULTURAL ENTERPRISES

STATEWIDE EDUCATIONAL PROGRAMS IN **CITIZEN AWARENESS OF FOOD SYSTEMS AND THE ENVIRONMENT**

SITUATION

According to the 2012 Census of Agriculture, Florida contains 47,740 farms, totaling 9,548,342 acres of land in agricultural production (USDA, 2014). As such, agricultural lands account for 22.7% of the total land area of Florida. In addition to generating food and other agricultural products, these lands provide an array of ecosystem services that benefit Florida residents (see Table 1; Bohlen et al., 2009; Dale & Polasky, 2007; Swain et al., 2007). However, agricultural lands and the ecosystem services provided by these lands are under threat from rapid population growth and urban development in Florida (Walker, 2001). The University of Florida's GeoPlan Center has estimated that by 2060 approximately 2.7 million acres of existing agricultural land in Florida (~28.3% of all agricultural land) will be converted to urban development to house the state's growing population (Zwick & Carr, 2006).¹ It is reasonable to expect that the conversion of agricultural land to urban development will reduce the provision of ecosystem services in Florida, which in turn will adversely affect the welfare of Florida residents.

Table 1: Ecosystem Services Provided by Agricultural Lands

Ecosystem Service	Examples
Provisioning	Food for human consumption produced from managed agro-ecosystems Raw materials for construction and fuel, including wood, biofuels and plant oils
Regulating	Water purification Flood protection and water storage Carbon sequestration and storage Erosion prevention and maintenance of soil fertility Pollination provided by insects, birds and bats Biological control (regulation of pests and vector borne diseases that attack plants, animals and people) by birds, bats, insects, frogs and fungi
Supporting/habitat	Habitats for native and imperiled species Maintenance of genetic diversity
Cultural	Recreation, e.g. hunting Tourism, e.g. agritourism and farm stays Sense of place and cultural identity

Source: <http://www.teebweb.org/resources/ecosystem-services/>

Public support is required for policies that protect agricultural lands in Florida. However, it is unclear whether the majority of Florida residents are aware of the various ecosystem services provided by agricultural lands or the threats that population growth and poorly-planned urban development pose to agriculture in Florida. As such, our goals are to:

1. Better inform Florida residents about the economic importance of agriculture to the state of Florida, the amount of land in agricultural production in Florida, and the types of agricultural production in Florida;
2. Better inform Florida residents about the various ecosystem services provided by agricultural lands, and how these ecosystem services improve residents' wellbeing;
3. Increase Florida residents' financial support for Florida agriculture through increased purchases of Florida-grown products or participation in agritourism;

¹ See: https://www.geoplan.ufl.edu/lucis/1000friends_results.html

4. Better engage Florida residents in decision-making about agricultural production in Florida, including efforts to protect agricultural lands from conversion to other uses; and
5. Promote policy decision-making related to agriculture in Florida based on evidence-based analysis of facts and implications, including consideration of agriculture's ecosystem services.

The mission of the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is to develop knowledge in agriculture and natural resources and to make that knowledge accessible to sustain and enhance the quality of human life in Florida. This plan of action is entirely consistent with the mission of UF/IFAS, aided by the fact that the Florida Cooperative Extension Service is well positioned to provide scientific knowledge and expertise to Florida residents. UF Extension agents have formed working relationships with agricultural landowners across the state, which would allow Extension agents to conduct outreach programming with Florida residents, including farm visits. UF Extension also has a reputation for being nonpartisan, which means that Florida residents are more likely to trust information provided by UF Extension than other agencies (e.g. government agencies, environmental NGOs).

This program is intended to educate all Florida residents. Clients include (but are not limited to):

- Residential and urban residents (children and adults) who are unfamiliar with Florida's agricultural sector
- Primary and secondary school educators
- County and local government officials who are involved in land use planning

We are in the process of developing collaborations and partnerships as needed to expand this program. Relevant potential partnerships are identified below for each of the program objectives. Our intention is to solicit grant funds to develop and expand this program, for example through the United States Department of Agriculture (USDA) Renewable Resources Extension Act (RREA).

There are multiple opportunities related to this program. The leadership team is in the process of creating evaluation methods that may be used by County Extension faculty to evaluate their diverse extension efforts related to citizen awareness of food systems and the environment. County faculty that utilize these evaluation methods should send their evaluations to Elizabeth Pienaar (Extension Specialist) to be analyzed. Dr. Pienaar will send the analyzed data back to the individual County faculty for use in their reporting and will also create annual reports on the statewide impacts of this program to be used by County faculty and IFAS Extension in their reporting. This will allow County Extension agents to document the short-, medium- and long-term impacts of their extension programming efforts using science-based evidence. Dr. Pienaar will also ensure that the evaluation methods have been approved by the University of Florida Institutional Review Board (IRB) before they are used by County agents.

One of the key challenges related to this program is that people are unfamiliar with, or misunderstand, the term ecosystem services. County Extension agents should rather refer to specific services or benefits provided by agricultural lands (see Table 1) in their programming. To assist in addressing this challenge, the leadership team will generate EDIS documents that County Extension agents can use in their programming. It will take time to generate a complete set of EDIS documents. County Extension agents should provide input into which EDIS documents are of highest priority.

PROGRAM OBJECTIVE (#1)

Attain a 30% increase in program participants' knowledge of the economic importance of agriculture to the state of Florida, the amount of land in agricultural production in Florida, and the types of agricultural production in Florida after attending a program event. Attain a 30% increase in program participants' stated support for Florida agriculture.

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

Educational methods used (outputs) for this objective will include fact sheets and EDIS documents to be used in educational programs; presentations by Extension agents at workshops, fairs, exhibits, and community events; field days

and farm tours; and information videos and social media. While education materials will be primarily targeted for adults, Extension agents should be able to modify these materials for audiences that are composed primarily of children.

Topics covered (inputs) include:

- the economic importance of agriculture to the state of Florida
- the amount of land in agricultural production in Florida
- types of agricultural production in Florida

Partners or collaborators (inputs) include FDACS resources (brochures on seasonal availability of produce, production levels by county/state-wide, etc.), UF Food & Resource Economics Dept. (reports on economic impacts of agriculture, natural resources, and related food industries), USDA National Agriculture Statistics Service Census of Agriculture data, and County Property Appraisers' offices (reports on acreages of agriculturally classified land by commodity).

The target audience shall include both youth and adults, particularly urban residents with minimal connection to agricultural lands and production. Other key audiences include County and local government officials who are involved in land use planning.

Evaluation methods: We will use reflective post-program surveys that will measure program participants' knowledge of and support for Florida agriculture before and after the program. Program participants will gauge their levels of knowledge and support before and after the program, and these metrics will be used to measure the increase in participants' knowledge and support. Evaluations will be administered immediately after conclusion of workshops, farm tours, etc.

Evaluation measures:

Reflective post-program evaluation: We are interested to know whether this event improved your knowledge about, and support for, agriculture in Florida.

Please indicate your level of knowledge about the following topics before and after this event:

	Knowledge BEFORE the event	Knowledge AFTER the event
The amount of land in agricultural production in the state of Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
The diversity of crops grown in Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
Each farm and ranch in Florida often produces multiple agricultural commodities	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
The size of the livestock industry in Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount

The economic importance of agriculture to the state of Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
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Please indicate your level of agreement with the following statements before and after this event:

	Level of agreement BEFORE the event	Level of agreement AFTER the event
It is important to keep land in agricultural production in Florida	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree
I am concerned about the loss of agricultural land to urban development	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree

Do you plan to purchase more food products that are grown in Florida? YES NO UNDECIDED

Workload Indicator: Percent change in program participants’ awareness of agriculture’s economic importance, the amount of land in agricultural production, and/or production types.

Outcome: Increased knowledge of agriculture in the state of Florida, including agriculture’s economic importance, the amount of land in agricultural production, and/or production types. Increase in the number of participants viewing agricultural land preservation as important. Increase in the number of participants planning to purchase more food products grown in the state of Florida.

Impact: By expanding participants’ knowledge of the importance of agricultural production, the amount of land in agricultural production, and types of agricultural production, Extension can help decision makers and residents to gain a broadened perspective and understanding of the importance of agriculture in our state and local economy.

PROGRAM OBJECTIVE (#2)

Attain a 50% increase in program participants’ knowledge of the ecosystem services that agricultural lands in Florida provide to Florida residents and how these ecosystem services benefit Florida residents after attending a program event.

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

Educational methods used (outputs) for this objective will include fact sheets and EDIS documents to be used in educational programs; presentations by Extension agents at workshops, fairs, exhibits, and community events; field days and farm tours; and information videos and social media. While education materials will be primarily targeted for adults, Extension agents should be able to modify these materials for audiences that are composed primarily of children.

Topics covered (inputs) include:

- ecosystem services that agricultural lands in Florida provide to Florida residents
- how these ecosystem services benefit Florida residents

Potential partners or collaborators (inputs) include the UF Agro-ecology Program, Florida Fish and Wildlife Conservation Commission, The Nature Conservancy, MacArthur Agro-ecology Research Center, local land trusts, and other organizations engaged with working lands and agroecology.

The target audience shall include both youth and adults, particularly urban residents with minimal connection to agricultural lands and production. Other key audiences include County and local government officials who are involved in land use planning.

Evaluation methods: We will use reflective post-program surveys that will measure program participants’ knowledge of and support for Florida agriculture before and after the program. Program participants will gauge their levels of knowledge and support before and after the program, and these metrics will be used to measure the increase in participants’ knowledge and support. Evaluations will be administered immediately after conclusion of workshops, farm tours, etc.

Evaluation measures:

Reflective post-program evaluation: We are interested to know whether this event improved your knowledge about the quality of life benefits generated by agriculture in Florida.

Please indicate your level of knowledge about the following topics before and after this event:

	Knowledge BEFORE the event	Knowledge AFTER the event
The environmental benefits provided by agricultural land in Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
How agricultural lands support native plants and animals in Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
The cultural heritage of agriculture in Florida	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount
The use of agricultural lands to provide outdoor recreation and entertainment opportunities	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount	<input type="checkbox"/> Nothing <input type="checkbox"/> A little <input type="checkbox"/> A moderate amount <input type="checkbox"/> A considerable amount

Please indicate your level of agreement with the following statements before and after this event:

	Level of agreement BEFORE the event	Level of agreement AFTER the event
I am concerned about the environmental impacts if agricultural lands are converted to urban development	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree

Protecting agricultural lands enhances my quality of life	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree	<input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree
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Which of the benefits that are provided by agricultural lands in Florida are **most** important to you?

Please indicate your level of agreement with the following statement: “The state government should use tax dollars to help protect agricultural lands in Florida”.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Workload Indicator: Percent change in program participants’ awareness of agriculture’s beneficial ecosystem services.

Outcome: Increased knowledge of the beneficial ecosystem services provided by agriculture in the state of Florida. Increased desire to preserve agricultural lands.

Impact: By expanding participants’ knowledge of the agriculture’s ecosystem services, Extension can help decision makers and residents to gain a broadened perspective and understanding of the cultural, provisioning, regulating, and supporting functions of agricultural lands.

PROGRAM OBJECTIVE (#3)

At least 25% of program participants will share the information that they obtained during the program event with others, within 12 months of the program.

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

Educational methods used (outputs), topics covered (inputs), target audience (input), and partners or collaborators (inputs) for this objective are those of Objectives #1 and/or 2. Objective #3 seeks to determine whether participants shared the knowledge they gained from their participation in programs developed under Objective #1 or 2.

The target audience shall include both youth and adults, particularly urban residents with minimal connection to agricultural lands and production. Other key audiences include County and local government officials who are involved in land use planning.

Evaluation methods used will include reflective surveys, administered 6-12 months after program delivery, asking participants whether they shared the information they obtained during a program event with others. An online version of the survey will be created that may be emailed to program participants.

Evaluation measure:

Did you share any of the information you learned during [the educational event] with other people who did not attend this event? YES NO

If NO: Why didn't you share this information?

- I don't know anyone who would be interested in this information
- I don't know how to share this information
- I don't agree with the information presented in the program
- Other: _____

If YES: Who did you share this information with? *(Please check all boxes that apply)*

- Family
- Friends
- Work colleagues
- Individuals I teach (e.g. school students)
- Government officials
- Other, please specify:

If YES: Approximately how many people did you share the information you learned with? *(Please check one box)*

- Less than 5 people
- 6 to 10 people
- 11 to 20 people
- Over 20 people

If YES: What information did you share? *(Please check all boxes that apply)*

- The amount of land in agricultural production in the state of Florida
- The diversity of crops grown in Florida
- Each farm and ranch in Florida often produces multiple agricultural commodities
- The size of the livestock industry in Florida
- The economic importance of agriculture to the state of Florida
- The environmental benefits provided by agricultural land in Florida
- How agricultural lands support native plants and animals in Florida
- The cultural heritage of agriculture in Florida
- The use of agricultural lands to provide outdoor recreation and entertainment opportunities

Workload Indicator: NA

Outcome: Participants shared with others what they learned about agriculture and/or its ecosystem services.

Impact: By teaching participants, who in turn share information with others, Extension is able to reach a much larger audience, sharing information related to agriculture and its importance to our economy, culture, and environment.

PROGRAM OBJECTIVE (#4)

At least 25% of program participants will support Florida agriculture by increasing their purchases of Florida-grown products or participating in agritourism within 12 months of attending a program event.

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

Educational methods used (outputs), topics covered (inputs), target audience (input), and partners or collaborators (inputs) for this objective are those of Objectives #1 and/or 2. Objective #4 seeks to determine whether participants increased their support of Florida agriculture after participating in programs developed under Objective #1 or 2.

The target audience shall include both youth and adults, particularly urban residents with minimal connection to agricultural lands and production. Other key audiences include County and local government officials who are involved in land use planning.

Evaluation methods used will include reflective surveys, administered 6-12 months after program delivery, asking participants about their purchasing behavior.

Evaluation measures:

Since attending [Extension program], have you purchased Florida-grown food?

- Yes
- No
- I don't recall/I don't know

If YES: What types of Florida-grown food have you purchased?

Would you say that your purchases of Florida-grown food have increased, decreased, or stayed the same since attending [Extension program]?

If increased or decreased, ask: Could you explain why your purchases of Florida-grown food have [increased or decreased]?

Since attending [Extension program], have you participated in an agritourism activity (U-pick, crop maze, event venue rental, farm tour, etc.) on a Florida farm?

- Yes
- No

If YES: What types of agritourism activities have you participated in?

Would you say that your participation in agritourism has increased, decreased, or stayed the same since attending [Extension program]?

If increased or decreased, ask: Could you explain why your participation in agritourism activities have [increased or decreased]?

Workload Indicator: Number of participants who increased purchases of Florida-grown food or participated in agritourism activity as determined in a follow-up evaluation.

Outcome: Participants increase their purchases of Florida-grown food (if these items are available to them) and/or participated in Florida agritourism activities.

Impact: By teaching participants about agriculture and its importance to our economy, culture, and environment, participants may increase their support of agriculture by increasing their purchases of Florida-grown food and/or participating in Florida agritourism activities.

PROGRAM OBJECTIVE (#5)

At least 10% of program participants will support keeping land in agricultural production in Florida, through engaging in the political process within 36 months of attending a program event.

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

Educational methods used (outputs) for this objective will include those described under Objectives #1 and/or 2, or new methods specific to Objective #5.

Topics covered (inputs) include those described under Objectives #1 and/or 2, or may include presentation of specific programs/policies designed to prevent the loss of agricultural lands to other uses.

Potential partners or collaborators (inputs) include those identified under Objectives #1 and/or 2, as well as local or regional planning agencies (regional planning councils, county planners, business development boards, economic development councils, etc.), FDACS BMP cost-share programs, and others.

The target audience shall be adults, particularly urban residents with minimal connection to agricultural lands and production. Other key audiences include regional and local government officials who are involved in land use planning.

Evaluation methods Reflective surveys will be administered 6-12 months after attending a program event.

Evaluation measure:

Have you actively supported keeping land in agricultural production in Florida, by participating in the political process (speaking at local government meetings, writing to your local or state elected officials, voting, etc.)?

- Yes
- No
- I don't recall/I don't know

If YES: Are you willing to share information about a particular policy or program you engaged with through the political process, and why you supported it or did not support it?

Workload Indicator: Number of participants reporting support of keeping land in agricultural production in Florida, through engagement in the political process.

Outcome: Increased support for programs or policies that prevent the loss of agricultural lands.

Impact: By increasing the number of residents who engage in the political process to actively support keeping land in agricultural production in Florida, Extension can help to protect agricultural lands from conversion to other uses, thereby retaining valuable ecosystem services associated with agricultural lands.

PROGRAM OBJECTIVE (#6)

Promote policy decision-making related to agriculture in Florida based on evidence-based analysis of facts and implications, including consideration of agriculture's ecosystem services, over a five-year period.

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

Educational methods used (outputs), topics covered (inputs), target audience (input), and partners or collaborators (inputs) for this objective are those of Objectives #1 and/or 2.

The target audience shall include both youth and adults, particularly urban residents with minimal connection to agricultural lands and production. Other key audiences include County and local government officials who are involved in land use planning.

Evaluation methods used will include interviews with local, regional, or state-level policy-makers (who attended Extension program events), regarding policies implemented over the past five-year period. Before conducting interviews, surveyors will identify a list of recently implemented policies related to agriculture in Florida. For each policy, interviewees will be asked to relate whether and to what extent evidence-based facts and implications, including agriculture's ecosystem services, were considered by decision-makers.

Outcome: Decision-makers applied evidence-based analysis of facts and implications, including consideration of agriculture's ecosystem services, in establishing new policies.

Impact: Creation of policies is based on the best available factual information and with a broad understanding of potential policy implications.

NEEDS

- Assistance from team and specialists in refining this Plan of Action, particularly:
 - Developing state-wide or regional educational methods (curricula, programs, etc.) for Objectives 1 and 2; and
 - Reviewing the literature for research findings to better inform impact statements.
- The production of EDIS documents related to agricultural ecosystem services.

REFERENCES

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Walker, R. (2001). Urban sprawl and natural areas encroachment: linking land cover change and economic development in the Florida Everglades. *Ecological Economics*, 37(3), 357-369.

Zwick, P. D., & Carr, M. H. (2006). Florida 2060. A population distribution scenario for the State of Florida. A research project prepared for 1000 Friends of Florida by the GeoPlan Center at the University of Florida.

RESOURCES

Farm Tour Evaluation (to be updated)

Knowledge, Awareness, and Behavior Evaluation Measures (to be updated)

Ag Awareness Fun Fact Sheets (<http://branding.ifas.ufl.edu/postersfact-sheets/>)

EDIS document: Understanding Ag Awareness Programming throughout UF/IFAS Extension: Supporting Citizen Awareness of Food Systems and the Environment (<http://edis.ifas.ufl.edu/wc168>)