2013 University of the Virgin Islands Research Plan of Work

Status: Accepted

Date Accepted: 05/07/2012

I. Plan Overview

1. Brief Summary about Plan Of Work

The Agricultural Experiment Station (AES) is located on the St. Croix Campus of the University of the Virgin Islands. AES is part of the Research and Public Service Component. The U.S. Virgin Islands are semiarid, subtropical islands in the Lesser Antilles. The islands are marked by easterly trade winds which provide a nearly constant breeze and alternating periods of drought and heavy rain. A long tradition of agriculture in St. Croix provides an ideal location for our research mission. AES conducts basic and applied research to meet the needs of the local agricultural community in increasing production, improving efficiency, developing new enterprises, preserving and propagating germplasm unique to the Virgin Islands, and protecting the natural resource base. AES has research programs in animal science, aquaculture, biotechnology, forage agronomy, and fruit, ornamental and vegetable crops. Our vision is to generate information that leads to improved agricultural practices in the Virgin Islands and the Caribbean Region by conducting scientific research.Our research programs will be increasingly influenced by the needs of the public and the farming community and by research conducted by other agricultural research institutions. Using new technologies, the results of our research will be disseminated more widely to farmers and the international scientific community.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	13.0	0.0
2014	0.0	0.0	13.0	0.0
2015	0.0	0.0	13.0	0.0
2016	0.0	0.0	15.0	0.0
2017	0.0	0.0	15.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Combined External and Internal University External Non-University Panel

2. Brief Explanation

A merit review process is followed. Scientists submit a copy of their proposal to the

Director to ensure that the projects are in alignment with the University's strategic plan, the Research and Public Service Component's Master Plan and the AES strategic plan. The Director then attaches evaluation forms and sends the proposal to three people who are qualified to judge the proposal. At least one of the reviewers is selected from CES and others may be from the community. The reviewers are asked to rate the proposals on a scale of 1 to 5, 5 being the highest score, as to relevance of the proposed project to the agricultural sector (justification). The evaluated proposals are then returned to the Director who gives the reviews to the scientist for any needed revisions. The revised proposal is then returned to the Director who verifies the improvements in writing and gives final approval.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

AES faculty are participating in five multi-state research projects: 1) Impacts of Stress Factors on Performance, Health, and Well-Being of Farm Animals (W-2173); 2) Genetic Considerations for Beef Cattle Production in Challenging Environments(S-1045); 3) Microirrigation for sustainable water use(W2128); 4) Plant Genetic Resources Conservation and Utilization (S009). The Director is also the Administrative Advisor, and a participant as Animal Scientist, in a Southern Coordinating Committee (SCC- 081 Sustainable Small Ruminant Production in the Southeastern U.S.). Faculty in AES mentor students supported by funds from a grant from the USDA-NIFA Resident Instruction Grants Program for Institutions of Higher Education in Insular Areas. All of these projects address issues that are of concern to our stakeholders as evidenced by input obtained from our Advisory Council as well as our informal contacts with producers, students and other faculty.

After the retirement of the Aquaculture faculty in FY 2011 the program was evaluated based on stakeholder input, community needs and current and future economic conditions in the USVI and the University. It was decided to scale back the Aquaculture program to focus on the area of aquaponics and merge the remaining Aquaculture staff into the Horticulture program to be managed by that research faculty. This will merge the two disciplines that are involved in aquaponics with the intent of providing a system evaluating the production of both fish and crops that would be more applicable to users in the USVI. It will also allow the redirection of some of our limited staffing resources to other research programs that are in dire need of support such as the Agronomy program.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

Almost all of the farming community in the USVI can be considered small scale and limited resource farmers. The limitations include land, water, infrastructure support, available markets and the high cost of production in the islands. Most of our projects focus on evaluating or developing production methods that can be adopted by small scale farmers with limited resources with minimal financial input. The ethnic makeup of the farming population is predominantly African-American and Hispanic.

3. How will the planned programs describe the expected outcomes and impacts?

Faculty involved in each program establish a set of outcomes for the program. The outcome may consist of the number of local farmers who adopt a new technology or farming practice or how many use a new variety of plant or breed of livestock. The impacts are reported as to how these new technologies, varieties or breeds improve the overall operation of individual stakeholders.

4. How will the planned programs result in improved program effectiveness and/or

Effectiveness will be enhanced by targeting issues that are highly relevant to tropical agriculture. The programs will address local needs identified by stakeholders through various forms of input. The information generated by the research projects will be disseminated to the appropriate audience in the appropriate format so that it can have the most impact.

Efficiency of programs will be improved by using stakeholder input to develop research projects that are relevant to the local community and can eventually have an impact. Issues that are relevant to the USVI, as well as other locations, will also be included in research projects. Encouraging faculty to develop cooperative efforts with scientists outside the region will provide access to technology or assistance that is not available locally.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public

Brief explanation.

Due to the small geographic area of the Virgin Islands, AES scientists work in close contact with the local agricultural community, which fosters considerable communication and responsiveness to farmers' needs. AES programs hold field days that are advertised in the local media (print, TV, radio). Virgin Islands farmers and interested citizens tour current projects and have an opportunity to comment on the work that is being performed. Selected farmers are invited to AES seminars when the topic is relevant to their operations.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Other (Individual, direct contacts from the community)

Brief explanation.

The Agricultural Experiment Station's Advisory Council consists of farmers that represent a cross-section of the Virgin Islands farming community (plants, aquaculture and livestock). All AES Program Leaders sit in on the meetings as well as a representative from the Cooperative Extension Service. The farmers are given the opportunity to raise their

concerns. AES scientists try to incorporate researchable issues into their research programs. Non-researchable concerns are referred to CES or appropriate federal or state agencies for action.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Other (Clients contact AES with specific requests)

Brief explanation.

In addition to our formal stakeholder meeting we are in contact with the wider stakeholder community frequently. When we assist with workshops we get feedback that we incorporate into our research programs as appropriate.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Research Programs

Brief explanation.

AES scientists try to incorporate researchable issues into their research programs. Non-researchable concerns are referred to CES or appropriate federal or state agencies for action.

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

This programs supports science that boosts U.S. and USVI agricultural production. This research will contribute to improving food production and quality to meet the ever increasing demand locally and globally.

This program also includes science that addresses food security for vulnerable populations locally in the USVI and globally. Included within this program are projects related to 1) Plants and their systems and 2) Animals and their systems

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources			5%	
102	Soil, Plant, Water, Nutrient Relationships			5%	
201	Plant Genome, Genetics, and Genetic Mechanisms			5%	
202	Plant Genetic Resources			10%	
204	Plant Product Quality and Utility (Preharvest)			10%	
205	Plant Management Systems			10%	
206	Basic Plant Biology			5%	
216	Integrated Pest Management Systems			5%	
301	Reproductive Performance of Animals			10%	
302	Nutrient Utilization in Animals			5%	
303	Genetic Improvement of Animals			5%	
305	Animal Physiological Processes			5%	
307	Animal Management Systems			15%	
403	Waste Disposal, Recycling, and Reuse			5%	
	Total			100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Global food security and hunger relates to research being conducted in all programs within AES. Because of our limited land mass, small farm size and other production constraints food security is a major concern to our island population.

Small farm holders operating under limited external input farming conditions depend on the production of a diversity of farm products to be sold and consumed on the farm and in the extended family community. This includes agronomic, horticultural and livestock products

Agronomy Research Opportunities

When cover crops are planted during fallow periods between main crops, they can improve soil physical, chemical, and biological properties and consequently lead to improved soil health and yield of principal crops. Livestock incorporation can provide valuable additional revenue to small holder farmers and can serve as a primary source of organic fertilizer through added manure production. Therefore,

cover crops may be able to serve to build and improve soils for cash crop production, as well as provide forage in the form of principle grazing, stored hay, cut and carry forage or green chop for livestock production.

Aquaculture Research Opportunities

To overcome environmental constraints and increase local food supplies new production technology such as aquaponics is needed. The UVI Aquaculture Program has developed small aquaponic systems that are reliable, productive and well suited for the Virgin Islands. The UVI aquaponic commercial-scale system is capable of producing more approximately 12,000 lbs. of fish and vegetables on 1/8th acre of land with water supplied solely through rainwater harvesting. Adoption of aquaponic technology in the Virgin Islands to a small scale system and promoting its use by small farmers would increase the local supply of fish and vegetables, improve the economy and provide health benefits to consumers.

Animal Science Research opportunities

Animal Science will focus on the primary forage-consuming species (beef cattle and sheep) and meat production. Livestock production in the tropics can be heavily influenced by seasonal forage availability. Both cattle and sheep production are forage based industries due to the high cost of imported concentrate feeds. Research will focus on sustainable production systems. Research will be focused on evaluating animal performance under tropical conditions using animal production traits (growth, fertility and health) as indicators

Biotechnology Research opportunities

Plant biotechnology will utilize molecular techniques, tissue culture and conventional breeding to characterize micropropagate and develop improved tropical crop plants with enhanced characteristics, respectively. Molecular techniques will be used to identify plant viruses, bioflavonoid and carbohydrate levels. Plant tissue culture will be utilized to develop micropropagation techniques and maintain virus-free germplasm. Plant breeding will focus on selection for tolerance to high pH calcareous soils, larger fruit, hybrid vigor, bioflavonoid and carbohydrate content.

Horticulture research opportunities

Vegetable crops are grouped according to priority and economic importance, which is based on market and consumer demands. Vegetable groups consist of: l) high-demand crops (tomato, cucumber, okra, peppers and eggplant); and 2) low demand crops (collard greens, beans, cantaloupes, watermelons, onions, squash, and beet). Cultivars for each vegetable crop will be evaluated using sustainable vegetable production methods including organic fertilizers, mulches, and rotation with cover crops as green manure. Sustainable production systems will be compared to conventional production systems. Cultivar selection will be based on disease resistance characteristics according to the prevailing disease incidence in the USVI.

2. Scope of the Program

- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Animals and their systems

Research will develop information needed to assist the livestock producers of the USVI and to achieve efficient production by contributing to the solutions of livestock production problems. Issues of importance are reducing costs of production, feed resources, animal health (ecto- and endo-parasites) parasites and producing a quality product for market. All animal related research is relevant to the territory and undergoes review for merit and animal care and use.

Plants and their systems

Research will develop information for local producers on relevant varieties of crops, plant management and methods to maximize yield under local conditions. Sustainable production practices will be developed and adopted.

2. Ultimate goal(s) of this Program

Plants and their systems

- Evaluate tropical grasses and legumes for use as dual purpose crops to meet the requirements of a productive and beneficial cover crop and serve as valuable livestock forage.
- Evaluate the re-growth competitiveness of sorghum sudan grass, sunn hemp, and lab lab in monoculture and in grass/legume combinations against tropical weeds under three different harvest intervals in organic mixed cover crop-livestock systems.
- Evaluate Crotalaria juncea (cv. Tropic Sun) as a viable hay source for small ruminant production in mixed cover crop-livestock systems.
- Determine cover crop and forage removal impact on soil fertility and nutrient composition.
- Determine the seed production capabilities of Crotalaria juncea when coupled with biomass removal for forage production.
- Cassava - determine the starch production and starch content of cassava lines that can be used for domestic or industrial purposes.
- Sweet Potato - evaluate the benefits of growing disease-free cultivars for production. Sorrel - use plant breeding to improve fruit bioflavonoid content and tolerance to high pH calcareous soils.
- Pitaya: screen pitaya germplasm and develop protocols for production.
- Papaya: evaluate the need for potassium and calcium above what is present in the soil as well as micronutrient needs for a productive crop.
- Sweet potato: Identify virus-free varieties with improved quality and high productivity in sustainable, integrated cropping systems.
- Cassava: Evaluate germplasm for starch characteristics to improve the production and quality.
- Sorrel: screen germplasm from USDA and AVRDC collection for production potential in the Virgin Islands.
- Develop low-cost and profitable production systems for year-round vegetable production in the USVI.
- Varieties with reduced pesticide and fertilizer requirements will be readily adopted by farmers with limited resources.
- Increasing production of vegetable crops will impact positively in the local economy by reducing imports from the mainland and other Caribbean countries.
- Evaluate varieties with modified characteristics such as improved yield, quality and high productivity in sustainable and integrated cropping systems.

Animals and their systems

- Evaluate a low cost management technique that has the potential to increase lamb survival
- Compare managed breeding with accelerated lambing to open breeding
- Evaluate the relationship between external parasite burdens and production traits of cattle.
- Evaluate breeding of yearling heifers on their long term productivity

• Develop profitable aquaponic systems that are adopted by Virgin Islands farmers and used to increase the local supply of fresh fish and vegetables

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	11.0	0.0
2014	0.0	0.0	11.0	0.0
2015	0.0	0.0	11.0	0.0
2016	0.0	0.0	13.0	0.0
2017	0.0	0.0	13.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Conduct resercah projects
- Present data oat conferences
- Publish results in sceintific journals

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods

3. Description of targeted audience

The target audience for this research is the farming and general community of the USVI, wider Caribbean region and tropical and subtropical areas throughout the world, and other scientists.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Abstracts presented at conferences

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of new farmers adopting aquaponic technology
2	Number of local farmers that utilize cover crop technologies in mixed crop-livestock production systems.
3	The number of farmers who use the tested cover crops for soil improvement and as livestock forage.
4	Number of local farmers using proper fertilizer for papaya production, growing disease-free sweet potato, producing high starch content cassava and sorrel with high bioflavonoid content.
5	Selection of pest and disease resistant cultivars of vegetable crops for use by local farmers
6	Number of producers using later weaning in their sheep production.
7	Number of livestock producers that use a managed breeding system.

Outcome # 1

1. Outcome Target

Number of new farmers adopting aquaponic technology

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of local farmers that utilize cover crop technologies in mixed crop-livestock production systems.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

The number of farmers who use the tested cover crops for soil improvement and as livestock forage.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 205 - Plant Management Systems
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Number of local farmers using proper fertilizer for papaya production, growing disease-free sweet potato, producing high starch content cassava and sorrel with high bioflavonoid content.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5

1. Outcome Target

Selection of pest and disease resistant cultivars of vegetable crops for use by local farmers

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Number of producers using later weaning in their sheep production.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 7

1. Outcome Target

Number of livestock producers that use a managed breeding system.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes

Description

Hurricanes can impact all of the research activities by damaging facilities and crops. Local economic issues can reduce appropriations to UVI from the local government which can curtail hiring or filling critical vacancies.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

During workshops and field days, input will be sought from local producers as to how they are adopting the results of the research. Feedback from our Advisory Council will also be sought periodically.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

Because of our location in the tropics environmental issues are of great concern to local producers. Some of our research focuses on the high temperatures and limited water supply and how they impact plant and animal production.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships			15%	
111	Conservation and Efficient Use of Water			10%	
132	Weather and Climate			20%	
205	Plant Management Systems			10%	
305	Animal Physiological Processes			10%	
306	Environmental Stress in Animals			20%	
307	Animal Management Systems			5%	
405	Drainage and Irrigation Systems and Facilities			10%	
	Total			100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The high heat and humidity and limited rainfall in the semi-arid tropics have a great impact on agriculture production. As climate change causes more wide variations climate throughout the world our research is being conducted to evaluate the impact on livestock and crop production.

Animal Science Research opportunities

Heat stress in livestock is a large detriment in many regions of the US as well and this information can be incorporated with other research on the topic. Evaluating the ability of local cattle and sheep to thrive under conditions of high heat and humidity in the region can lead to methods to select for these traits to incorporate into other breeds. Various methods to measure the heat tolerance of local breeds are being used and compared. Physiological traits such as body temperature, sweating rate and hair coat characteristics are being evaluated as well.

Horticulture Research opportunities

Water is the most limiting constraint to agricultural production in the USVI. Existing ponds and dams are not sufficient to effectively store water for agricultural purposes. Underground water is used primarily for urban consumption together with desalinized seawater which makes it very expensive for the horticultural industry. Growers are aware of the benefits of micro-irrigation technology. However, water costs and availability as well as irrigation strategies have shown to be the limiting factor for crop production and hence for adoption. Knowledge about automatic control systems and water management strategies as well as water requirements (crop coefficients) will contribute to improve irrigation efficiency and water use efficiency. In addition, promoting production of shade loving crops will also increase water use efficiency and reduce water requirements for crop production in the USVI.

2. Scope of the Program

- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Animals and their systems

Senepol cattle are well suited to the tropical environment. They possess traits such a slick hair coat that add to this adaptation. There has been little work done to relate the coat characteristics and body temperature to production traits under tropical conditions. The animal health issue of external parasites will also be included to determine if there are genetic traits that relate to parasite burdens and how that relates to production traits. Characterizing the traits that provide heat tolerance will allow selection or these traits to maximize the benefits under tropical conditions.

Plants and their systems

Irrigation strategies based on soil water availability and plant requirement will improve irrigation efficiency. Soil moisture levels maintained slightly below field capacity and amount of water applied according to evapo-transpiration will reduce losses by percolation and run off. In the case of shade crops, less water will be needed to dissipate the reduced solar energy reaching the plant canopy. In addition, ground and air temperature as well as wind will decrease and relative humidity will increase under shade reducing evapo-transpiration. Excess of shade, however, may reduce photosynthesis affecting yield and crop quality.

2. Ultimate goal(s) of this Program

- determine the relationship between hair coat characteristics and body temperature of Senepol cattle
- development of methods to measure body temperature in cattle and hair sheep
- adoption of irrigation strategies based on soil moisture and water requirements (evapo-transpiration) to increase irrigation efficiency in the USVI.

• increase production of shade crops to increase water use efficiency and, consequently, reduce water requirements and the dependency on expensive off farm irrigation water.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	2.0	0.0
2014	0.0	0.0	2.0	0.0
2015	0.0	0.0	2.0	0.0
2016	0.0	0.0	3.0	0.0
2017	0.0	0.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Conduct research
- Publish results in scientific journals
- Present data at conferences
- Collaborate with other members of multistate project

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods

3. Description of targeted audience

- Beef cattle producers in the tropics, greater Caribbean, Central and South America and the southern US.
- Local crop farmers and back yard growers.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Abstracts presented at conferences

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of farmers adopting irrigation strategies based on soil moisture
2	Knowledge of fertigation and chemigation use in vegetable crop production
3	Determine traits for heat tolerance by using indirect measures.

Outcome # 1

1. Outcome Target

Number of farmers adopting irrigation strategies based on soil moisture

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate
- 205 - Plant Management Systems
- 405 - Drainage and Irrigation Systems and Facilities

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Knowledge of fertigation and chemigation use in vegetable crop production

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate
- 205 - Plant Management Systems
- 306 - Environmental Stress in Animals

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Determine traits for heat tolerance by using indirect measures.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes

Description

Hurricanes can impact all of the research activities by damaging facilities and crops. Local economic issues can reduce appropriations to UVI from the local government which can curtail hiring or filling critical vacancies.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

During workshops and field days, input will be sought from local producers as to how they are adopting the results of the research. Feedback from our Advisory Council will also be sought periodically.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

No activities planned

3. Program existence : New (One year or less)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior			100%	
	Total			100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

No activities planned

2. Scope of the Program

- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

No activities planned

2. Ultimate goal(s) of this Program

No activities planned

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

No activities planned

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods

3. Description of targeted audience

No activities planned

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

Description

No activities planned

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

No Activities planned

3. Program existence : New (One year or less)

4. Program duration : Short-Term (One year or less)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
402	Engineering Systems and Equipment			100%	
	Total			100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

No Activities planned

2. Scope of the Program

- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

No Activities planned

2. Ultimate goal(s) of this Program

No Activities planned

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

No Activities planned

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods

3. Description of targeted audience

No Activities planned

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

Description

No Activities planned

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

No Activities planned

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

No Activities planned

3. Program existence : New (One year or less)

4. Program duration : Short-Term (One year or less)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies			100%	
	Total			100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

No Activities planned

2. Scope of the Program

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

No Activities planned

2. Ultimate goal(s) of this Program

No Activities planned

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2013	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

No Activities planned

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods

3. Description of targeted audience

No Activities planned

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

Description

No Activities planned

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}