V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program
Global Food Security and Hunger

2. Brief summary about Planned Program

Despite efforts to establish an agricultural base that could provide a substantial portion of the food needed for people living in Alaska, the agricultural industry remains small and diverse. Alaskans are aware that a significant portion, 90% or more, of the food they consume is imported. The Alaska Native population is not historically agrarian but rather a hunting and gathering people. Information about high latitude agriculture and horticulture is increasingly being sought by urban and suburban Alaskans, in traditional farming areas, rural communities, and new and existing businesses. These are also areas of close collaboration between the Agricultural and Forestry Experiment Station and the Cooperative Extension Service. Issues of food security, high latitude agriculture and high latitude soils easily blend research with Extension outreach education. Global food security programming encompasses animal agriculture, agronomic crops for food and feed, controlled environment/extended season growing, and field horticulture. The concentration of research and outreach is in best management practices for the production of food and livestock feed in the short arctic and subarctic growing season and resilience and adaptation to potential impacts of climate change. Agriculture and horticulture outreach include animal agriculture, agronomy, and field and controlled environment horticulture. Service within animal agriculture includes production of animals for commercial sale and for home use. Agronomy includes cereal grains, oilseed crops and forages. Commercial horticulture includes production of fruits and vegetables for sale off-farm and greenhouse vegetable production. Consumer horticulture includes home and community gardening. The Integrated Pest Management team works closely with Master Gardeners and Community and commercial vegetable and field crop growers, expanding the volume of public provided pest management education. Collaboration includes IPM, Pesticide Safety Education Program, Western Region IPM (WRIPM), Western Plants Diagnostics Network (WPDN), Natural Resources Conservation Service (NRCS), USDA Farm Service Agency (FSA), Rural Development, and the Pacific Land Grant Alliance (PLGA).

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

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
<th>%1862 Extension</th>
<th>%1890 Extension</th>
<th>%1862 Research</th>
<th>%1890 Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Appraisal of Soil Resources</td>
<td>0%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
<td>10%</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>Plant Management Systems</td>
<td>40%</td>
<td>40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>Pathogens and Nematodes Affecting Plants</td>
<td>0%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>Weeds Affecting Plants</td>
<td>5%</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>216</td>
<td>Integrated Pest Management Systems</td>
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<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Reproductive Performance of Animals</td>
<td>0%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Nutrient Utilization in Animals</td>
<td>15%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>307</td>
<td>Animal Management Systems</td>
<td>10%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>308</td>
<td>Improved Animal Products (Before Harvest)</td>
<td>10%</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>401</td>
<td>Structures, Facilities, and General Purpose Farm Supplies</td>
<td>0%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>402</td>
<td>Engineering Systems and Equipment</td>
<td>0%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>Drainage and Irrigation Systems and Facilities</td>
<td>0%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>502</td>
<td>New and Improved Food Products</td>
<td>0%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>601</td>
<td>Economics of Agricultural Production and Farm Management</td>
<td>5%</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>610</td>
<td>Domestic Policy Analysis</td>
<td>0%</td>
<td>2%</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

1. Situation and priorities

Alaska imports most of the food it consumes, has minimal agricultural infrastructure and processing capability, and a heritage that is based in hunting and gathering, rather than agrarian pursuits. The only attempt made to estimate food imports was in the mid-1980s when economists determined that approximately 5% was produced in the state. There has been additional work done beginning in 2009, but only on a regional basis. Conclusions reached do not differ from the work of the 1980's, but the mix of products has changed. The state invested substantial capital in developing two large agricultural projects: one for grain production to supply what they hoped would be a growing number of meat and dairy animals and another to establish dairies to increase the locally produced milk supply. Even though the state provided approximately 45% of the milk consumed and cattle and hog numbers had increased, the state still imported the vast majority of food consumed. Since that time milk and red meat production have
decreased substantially with little increase in other agricultural production and processing sectors. Recent increases in transportation costs, distribution, and food at the point of production outside Alaska have made Alaskans more vulnerable to disruption in the food supply chain. More data are needed on imports to enable those involved in research, education, and outreach to better prepare Alaskans to produce, process, and prepare fresh, local foods.

Agricultural lands in Alaska include both continental and maritime zones. On average the growing season is 100 days, soils are cool, day length during the growing season is approximately 22 hours in some areas, and the sun angle is low. Field vegetable crops are primarily cabbage, carrots, and lettuce. Potatoes and food-type bedding plants dominate the farm-gate value of horticultural crops and are, with the exception of potatoes, produced in structures that extend the growing season.

The state of Alaska is connected to the contiguous United States by a single highway artery, the Alaska Highway. There is no rail connection with the exception of container roll-on, roll-off barge service to Canada and Seattle, WA. The road system within the state is limited and effectively ends in Fairbanks in Alaska's interior. The Dalton Highway, servicing the North Slope oilfields is basically a single use oil-field supply corridor although there is public access. Alaskans are well-served by air freight that is costly and by barge service that is less costly but not as frequent. Any disruption in any one of these transportation modes will disrupt the food supply to and within Alaska. Subsistence (hunting and gathering) is significant in rural areas and a part of the culture in native communities. However, imported foods play an important, though not necessarily healthy, role in the diet in these communities. There are anecdotal indications that home garden production, local food production in community sustainable agriculture (CSAs), community garden production, and sales through farmers’ markets are increasing. Outreach to these producers concerning best varieties to use and best management practices are critical. In the animal segment of Alaska agriculture predominant livestock are beef cattle and reindeer with research, education and outreach support in place. Other traditional animal enterprises in the road/rail belt region include hogs, goats, sheep, and poultry. Appropriate outreach information from research centers outside Alaska is provided.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension
- Multistate Integrated Research and Extension

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

1. Assumptions made for the Program

Limited food and feed resources are a challenge for a large state with a small population that is concentrated in the road/rail belt and scattered in the remainder of the state among remote rural and village communities. This makes support for research, education and outreach in food security difficult. The challenges are more similar to Pacific Island communities than more traditional operations in the contiguous United States. Possible changes in the status of Conservation Reserve Program lands in Alaska will precipitate assistance to landowners in changing land use with an eye toward use of the lands for crop production that can be used for food, feed and potentially energy crops. An increased interest in native species for food uses like wild berries, herbs, other wild land resources will present a challenge for outreach. Regional food supply in the face of rising transportation costs and from the aspect of food safety will be important in Alaska, a state that now imports over 90% of its food supplies and processes virtually none. To support these new directions, education and training of youth and adults will be critical to supply
a newly shaped workforce.

2. Ultimate goal(s) of this Program

It is critical to communicate awareness of the food security problem to the entire population of Alaska, including individuals, families, and communities, as well as state and federal entities, nonprofit organizations that provide food for their clients such as school systems, hospitals, military bases, and food banks. Challenges exist for the State of Alaska as a government that would be called upon to assist in case of a disaster and eventually for the federal government that would also be called on for assistance. It is a wide-reaching problem, the breadth and depth of which is understood by few Alaskans.

Solutions must be sought to expand the agricultural system in Alaska for community security including marketing, processing and transportation. Small-scale agriculture for home and professional growers will remain focus areas as will research in agricultural science and system development, which includes pesticide education, crop development, and farming efficiencies for individuals, families, businesses, communities and the agricultural sector as a whole. Efforts in the Integrated Pest Management program will benefit food security. Finally, youth and adult continuing education will increasingly become an integrated component of both AFES and CES to supply an increasing demand for the labor force in Alaska as workers retire and new opportunities become available.

V(E). Planned Program (Inputs)

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Extension 1862</th>
<th>Extension 1890</th>
<th>Research 1862</th>
<th>Research 1890</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>7.0</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
</tr>
<tr>
<td>2014</td>
<td>7.0</td>
<td>0.0</td>
<td>7.6</td>
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</tr>
<tr>
<td>2015</td>
<td>7.0</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
</tr>
<tr>
<td>2016</td>
<td>7.0</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
</tr>
<tr>
<td>2017</td>
<td>7.0</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
</tr>
</tbody>
</table>

V(F). Planned Program (Activity)

1. Activity for the Program

Research and outreach will be integrated to assure that best management practices appropriate to Alaska are provided to the target audience. Resilience and adaptability of crops and animals to changes in the subarctic and arctic climate, and revitalization in research and extension programs relevant to regional and local food production and the safety of the foods produced and processed are critical to the food security of Alaska and will be an emphasis of these planned programs. An emphasis will also be placed on educating and training youth and adults in new fields opening in the Alaska workforce and continuing education and training programs that emphasize current needs as an aging workforce retires. Group and one-on-one educational activities with specific sectors of the pest management industry, the agricultural community, and the horticultural industry will provide individuals and businesses with important information. Increased reliance on the internet and distance education technology will enhance delivery to more people but there will continue to be reliance on traditional interactions that include forums, tours, response to emails, phone calls and walk-in stakeholders. Increasing partnerships with the agribusiness community will become an important strategy for assuring a secure food supply for Alaska.
2. Type(s) of methods to be used to reach direct and indirect contacts

<table>
<thead>
<tr>
<th>Direct Methods</th>
<th>Indirect Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education Class</td>
<td>Public Service Announcement</td>
</tr>
<tr>
<td>Workshop</td>
<td>Newsletters</td>
</tr>
<tr>
<td>Group Discussion</td>
<td>TV Media Programs</td>
</tr>
<tr>
<td>One-on-One Intervention</td>
<td>Web sites other than eXtension</td>
</tr>
<tr>
<td>Demonstrations</td>
<td>Other 1 (Media, DVDs)</td>
</tr>
</tbody>
</table>

3. Description of targeted audience

The target audiences include producers and consumers, communities, entrepreneurs, agribusinesses, industry leaders, and individuals and groups concerned about the quality of the Alaska environment, public resource agencies, public and private resource managers, other faculty and researchers, and undergraduate and graduate students. Advisors and the target audience include: Statewide Board of Advisors, Alaska Farm Bureau, and specifically, this program will provide new information on soil properties and classification to the USDA natural Resource Conservation Service, the USDA Forest Service, the Alaska Department of Natural Resources, borough governments, and Alaska Native Corporations.

V(G). Planned Program (Outputs)

NIIFA 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

- Output 1. Faculty will provide agricultural and horticultural workshops, short courses, classes, field days, and conferences aimed at improving food production and best management practices.

- Output 2: Faculty will provide agricultural and horticultural information through one-on-one consultations and consultations with organizations to provide information on best management practices of food production.

- Output 3. Horticultural crop research will concentrate on home and commercial varieties appropriate as Alaska food crops. Publications are the output measures.

- Output 4. Controlled environment horticulture will focus on technology and technology transfer concerning appropriate food crops and best management practices for crop production in specific environments. Output measures will be publications.

- Output 5. Focus will be on best management practices for food crops and variety evaluation. Output measures will be publications.

- Output 6. Focus will be on best management practices for livestock management and production for food. Output measures will be 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(I). State Defined Outcome

<table>
<thead>
<tr>
<th>O. No</th>
<th>Outcome Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outcome 1: Increase agronomic crop producers' ability to understand and assess best management practices of food crop production. Measure will be workshops and publications.</td>
</tr>
<tr>
<td>2</td>
<td>Outcome 2: Increase livestock producers' ability to understand and assess optimum production practices for food animal production.</td>
</tr>
<tr>
<td>3</td>
<td>Outcome 3: Increase participants' commercial and home horticulture optimum food crop growing techniques and improve management practices.</td>
</tr>
<tr>
<td>4</td>
<td>Outcome 4: Increase the number of activities that monitor and control invasive species and pests.</td>
</tr>
<tr>
<td>5</td>
<td>Outcome 5: Increase the number of adopters of new technology and management practices.</td>
</tr>
</tbody>
</table>
Outcome # 1

1. Outcome Target
Outcome 1: Increase agronomic crop producers' ability to understand and assess best management practices of food crop production. Measure will be workshops and publications.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 212 - Pathogens and Nematodes Affecting Plants
- 405 - Drainage and Irrigation Systems and Facilities
- 502 - New and Improved Food Products

4. Associated Institute Type(s)
- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target
Outcome 2: Increase livestock producers' ability to understand and assess optimum production practices for food animal production.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 502 - New and Improved Food Products

4. Associated Institute Type(s)
- 1862 Extension
- 1862 Research
**Outcome # 3**

1. **Outcome Target**

Outcome 3: Increase participants' commercial and home horticulture optimum food crop growing techniques and improve management practices.

2. **Outcome Type**: Change in Action Outcome Measure

3. **Associated Knowledge Area(s)**

   - 101 - Appraisal of Soil Resources
   - 102 - Soil, Plant, Water, Nutrient Relationships
   - 205 - Plant Management Systems
   - 212 - Pathogens and Nematodes Affecting Plants
   - 401 - Structures, Facilities, and General Purpose Farm Supplies
   - 402 - Engineering Systems and Equipment
   - 405 - Drainage and Irrigation Systems and Facilities

4. **Associated Institute Type(s)**

   - 1862 Extension
   - 1862 Research

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**Outcome # 4**

1. **Outcome Target**

Outcome 4: Increase the number of activities that monitor and control invasive species and pests.

2. **Outcome Type**: Change in Condition Outcome Measure

3. **Associated Knowledge Area(s)**

   - 205 - Plant Management Systems
   - 212 - Pathogens and Nematodes Affecting Plants

4. **Associated Institute Type(s)**

   - 1862 Extension
   - 1862 Research
Outcome # 5
1. Outcome Target

Outcome 5: Increase the number of adopters of new technology and management practices.

2. Outcome Type: Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)
   - 102 - Soil, Plant, Water, Nutrient Relationships
   - 205 - Plant Management Systems
   - 212 - Pathogens and Nematodes Affecting Plants
   - 301 - Reproductive Performance of Animals
   - 302 - Nutrient Utilization in Animals
   - 401 - Structures, Facilities, and General Purpose Farm Supplies
   - 402 - Engineering Systems and Equipment
   - 405 - Drainage and Irrigation Systems and Facilities
   - 502 - New and Improved Food Products

4. Associated Institute Type(s)
   - 1862 Extension
   - 1862 Research

V(J). Planned Program (External Factors)
1. External Factors which may affect Outcomes
   - Natural Disasters (drought, weather extremes, etc.)
   - Economy
   - Appropriations changes
   - Public Policy changes
   - Government Regulations
   - Competing Public priorities
   - Competing Programmatic Challenges
   - Populations changes (immigration, new cultural groupings, etc.)

Description

Alaska is the harbinger of climate change in the North. The region is already seeing impacts of the changing climate in its sea ice degradation, the ecology of the boreal forest, and its ice-impregnated northern soils. This will influence the thrust of agriculture in coming years.

Policy and regulation and competing public priorities are already coming to the fore as endangered species affect land use and food and feed crops are increasingly used for fuels.
Programmatic challenges will occur as consideration is given to the production of crops and the management of the forests for fuels to mitigate demands on petroleum and coal supplies. A continuing rise in transportation costs is already drawing attention to regional and local food production and processing.

Food safety is a rising concern if costs for chemical disease controls increase and integrated pest management systems are not fully in place. As home preservation and storage increase and small businesses begin to enter the food processing industry research, education and outreach will need to be in place to assure the safety of consumers. Finally, as demographics of the population change and demographics of the agricultural sector change, there will be a need for continuing adult education and higher education to fill workforce vacancies or new positions that are created to meet demands in energy, medical, food production and processing, and resource management fields.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The objective of the AFES and CES is to set in place a feedback loop that brings information from our units to our clientele and bring clientele input back to us to enable us to continue to adjust our work, within the capabilities of our space and budgets, to meet the needs of the people of Alaska.