V(A). Planned Program (Summary)

Program # 1
1. Name of the Planned Program
Agriculture and Horticulture

2. Brief summary about Planned Program

The Agriculture and Horticulture Planned Program includes nonfood agricultural research and extension activity. Information about high latitude agriculture and horticulture is increasingly being sought by urban Alaskans, those in traditional farming areas, rural communities, and new agriculture-based businesses, primarily in horticulture and landscaping. These are also areas of close collaboration between the Agricultural and Forestry Experiment Station and the Cooperative Extension Service and complement the planned program area of Global Food Security. Areas of emphasis are agronomic practices of crops, landscape and turf materials, and controlled environment/extended season and field horticulture including bedding plants and floral crops. The concentration of research and outreach is in best management practices for the production of these nonfood items during the short arctic and subarctic growing season and resilience and adaptation to potential impacts of climate change. Agriculture and horticulture outreach includes the areas of companion animal agriculture, agronomy, agroforestry, and horticulture. Service within animal agriculture includes horses and sled dogs. Agroforestry includes tree production for windbreaks, biofuels and other non-timber forest products. Horticulture includes commercial and consumer horticulture. Commercial horticulture includes commercial floriculture production, nursery production of woody and herbaceous ornamentals, greenhouse production of bedding plants, hanging baskets, and potted plants, landscape installation and maintenance services, golf course, sports field and runway turf management, and commercial lawn maintenance. Consumer horticulture includes home and community landscaping and lawn maintenance by the homeowner. Another important focus in outreach is pest management for community forestry, home and commercial horticulture, invasive plants, greenhouse production, structural pests, agriculture and the green industry such as turf, tree, and ornamental plant producers. Integrated pest management (IPM) is the primary approach, in collaboration with other agencies, to assist its stakeholders when providing pest management information and educational outreach. The IPM team works closely with Master Gardeners and Community Tree Stewards, expanding the volume of the 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, Western Rural Development Center (WRDC), and Pacific Land Grant Association (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>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
<td>10%</td>
<td></td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>Plant Management Systems</td>
<td>25%</td>
<td></td>
<td>40%</td>
<td></td>
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<tr>
<td>213</td>
<td>Weeds Affecting Plants</td>
<td>15%</td>
<td></td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>216</td>
<td>Integrated Pest Management Systems</td>
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<td>5%</td>
<td></td>
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<tr>
<td>301</td>
<td>Reproductive Performance of Animals</td>
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<td>15%</td>
<td></td>
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<tr>
<td>305</td>
<td>Animal Physiological Processes</td>
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<td></td>
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<tr>
<td>401</td>
<td>Structures, Facilities, and General Purpose Farm Supplies</td>
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<tr>
<td>405</td>
<td>Drainage and Irrigation Systems and Facilities</td>
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<td>10%</td>
<td></td>
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<tr>
<td>601</td>
<td>Economics of Agricultural Production and Farm Management</td>
<td>5%</td>
<td></td>
<td>10%</td>
<td></td>
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<td></td>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td><strong>100%</strong></td>
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V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Alaska has minimal agricultural infrastructure and servicing capability. Agricultural lands in Alaska include both continental and maritime zones. On average the growing season is 100 days, soils are cool, day length approximately 22 hours in some areas, and the sun angle is low. Bedding plants and landscape materials are produced in structures that extend the growing season and dominate the farm-gate value of horticultural crops. Hanging baskets and other floriculture may occupy these structures after the bedding-plant season. This horticultural produce moves to the consumer through the wholesale/retail chain. All other products go directly to retail markets that include grocery chains. Organic farming presents challenges to research and outreach. Horticulture is a high-demand workforce industry and there is currently not a trained labor force in the state. Controlled environment agriculture (CEA) research aims to increase horticulture crop production in Alaska. There is a new potential for production of nonfood crops, including oilseed and woody species for energy. Lands that are nearing the end of enrollment in CRP present a potential area for production of these crops. The horse owner market is believed to be the highest consumer of Alaska-grown hay. Resilience to climate change with potential changes in season length and water supply are critical additions to new research and outreach. There is a growing interest in hardy varieties of landscape crops that respond to low fertilizer, water, and pesticide use including native species. Sports turf is an economic opportunity with work continuing on golf greens and fairways and for ball fields. Sustainability of sports turf is an important consideration as energy and input costs rise. There are anecdotal indications that home garden production, including home floral production and sales through farmers' markets are increasing. Outreach to these producers concerning best varieties and best-management practices are critical. There are many horses and dogs in Alaska. Appropriate outreach information from research centers outside Alaska is provided. There is a demand for veterinary practitioners/technicians throughout the state.
2. Scope of the Program

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

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

1. Assumptions made for the Program

Changes in the status of CRP lands in Alaska will precipitate assistance to landowners in changing land use with an eye toward use of the lands for nonfood crops, including crop production that can be used for fuels. A challenge for the large number of horse owners is limited locally produced feed and high transportation costs. An increased interest in native species for both agricultural and horticultural activities will present a challenge for outreach. Energy will be a growing concern in food, feed, and fuel production. Education and training of youth and adults will be needed to supply a newly shaped workforce will be critical.

2. Ultimate goal(s) of this Program

Sustainable practices for agriculture and horticulture will continue to be a high priority in the next five years. Small scale agriculture for home and professional growers will remain a focus area as will research in agricultural science and industry development that includes pesticide education, crop development, and farming efficiencies for individuals, families and communities. The IPM program will continue to be a center of excellence on information for Alaskans to mitigate loss from native and invasive pest species, keeping pest species below economic threshold levels. AFES and CES will become prominent in information and research on alternative energy supplies and technology and energy conservation. Resilience and adaptability to climate change will be a focus in rural and urban areas as it affects Alaska's lands and forests. Finally, youth and adult continuing education will increasingly become an integrated component of both SNRAS/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>
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</thead>
<tbody>
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<td>0.0</td>
<td>3.1</td>
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<tr>
<td>2014</td>
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<td>2015</td>
<td>3.0</td>
<td>0.0</td>
<td>3.1</td>
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</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. There will be new directions in 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 nonfood agricultural production. 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 technology will enhance delivery to more people. Increasing partnerships will become important strategies in maintaining pest species below threshold levels. Outreach will also include forums, tours, response to emails, phone calls and walk-in stakeholders.

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 (Publications)</td>
</tr>
<tr>
<td>Other 1 (Consultations)</td>
<td></td>
</tr>
</tbody>
</table>

3. Description of targeted audience

Arborists, child care centers, farmers, garden and plant associations, public and commercial greenhouses, homeowner associations, landscapers, state and federal park employees, master gardeners, museums, military base personnel, boroughs and urban municipalities, pest control operators, property managers, public health organizations, public and private schools, recreational facilities, resorts and hotels, rural residents, youth groups, and school districts.
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 nonfood agricultural and horticultural workshops, short courses, classes, field days, and conferences including IPM.
- Output 2: Faculty will provide nonfood agricultural, horticultural and pest management information through one-on-one consultations and consultations with other organizations (in contact hours).
- Output 3. Horticultural crop research will concentrate on home and commercial varieties appropriate to Alaska. Publications and presentations are the output measures.
- Output 4. Controlled environment horticulture will focus on controlled environment technology and technology transfer and appropriate nonfood crops and best management practices for crop production in specific environments. Output measures will be publications and presentations.
- Output 5. Turf research will continue including variety selection and expansion into multiple use. Output measure will be publications, presentations and technology transfer.

☑ 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>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Outcome 1: Increase nonfood agricultural and horticultural producers' ability to understand and assess optimum production practices.</td>
</tr>
<tr>
<td>2</td>
<td>Outcome 2: Increase nonfood livestock producers' ability to understand and assess optimum production practices.</td>
</tr>
<tr>
<td>3</td>
<td>Outcome 3: Increase the number of activities that monitor and control invasive species and pests.</td>
</tr>
<tr>
<td>4</td>
<td>Outcome 4: Increase the number of adopters of new technology and management practices.</td>
</tr>
</tbody>
</table>
Outcome # 1
1. Outcome Target
Outcome 1: Increase nonfood agricultural and horticultural producers’ ability to understand and assess optimum production practices.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

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

Outcome # 2
1. Outcome Target
Outcome 2: Increase nonfood livestock producers’ ability to understand and assess optimum production practices.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
- 305 - Animal Physiological Processes

4. Associated Institute Type(s)
- 1862 Extension

Outcome # 3
1. Outcome Target
Outcome 3: Increase the number of activities that monitor and control invasive species and pests.

2. Outcome Type: Change in Action Outcome Measure

3. Associated Knowledge Area(s)
- 213 - Weeds Affecting Plants
Outcome # 4

1. Outcome Target

Outcome 4: Increase the number of adopters of new technology and management practices.

2. Outcome Type: Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 305 - Animal Physiological Processes
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 405 - Drainage and Irrigation Systems and Facilities

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. Finally, as demographics of the population change and demographics of the agricultural industry 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, 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. For example: reports to CES from greenhouses removing potentially invasive plants from sales inventory and cities/agencies/producers developing and implementing management plans. AFES and CES are continuing ongoing monitoring for gypsy moth and emerald ash borer.