

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture and Food Security

Reporting on this Program

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	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	10%		0%	
205	Plant Management Systems	10%		10%	
213	Weeds Affecting Plants	10%		0%	
216	Integrated Pest Management Systems	10%		0%	
301	Reproductive Performance of Animals	5%		10%	
302	Nutrient Utilization in Animals	0%		1%	
305	Animal Physiological Processes	0%		9%	
307	Animal Management Systems	10%		5%	
308	Improved Animal Products (Before Harvest)	5%		10%	
315	Animal Welfare/Well-Being and Protection	0%		5%	
401	Structures, Facilities, and General Purpose Farm Supplies	0%		10%	
402	Engineering Systems and Equipment	0%		5%	
404	Instrumentation and Control Systems	0%		5%	
405	Drainage and Irrigation Systems and Facilities	0%		5%	
502	New and Improved Food Products	10%		10%	
504	Home and Commercial Food Service	10%		0%	
601	Economics of Agricultural Production and Farm Management	10%		0%	
610	Domestic Policy Analysis	0%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Extension	Research

Year: 2012	1862	1890	1862	1890
	Plan	3.0	0.0	1.5
Actual Paid Professional	5.3	0.0	6.1	0.0
Actual Volunteer	0.0	0.0	4.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
190213	0	213193	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
249773	0	899081	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1632471	0	2287436	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research and outreach was integrated to assure that best management practices appropriate to Alaska are provided to the target audiences. 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 agricultural production are taking place. Emphasis was 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 are providing individuals and businesses with important information. Increased reliance on the Internet and distance technology enhanced delivery to more people. Partnerships are important strategies in maintaining pest species below threshold levels. Outreach included classes, workshops, conferences, forums, tours, response to emails, phone calls and walk-in stakeholders.

2. Brief description of the target audience

The target audiences included 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. Users included arborists, farmers, garden and plant associations, public and commercial greenhouses, homeowner associations, landscapers, state and federal park employees, gardeners, museums, military base personnel, local governments, pest control operators, property managers, public health organizations, public and private schools, recreational facilities, resorts and hotels, rural residents, youth groups and school districts. Advisors and the target audience include: Alaska Farm Bureau, USDA Natural Resource Conservation Service, the USDA Forest Service, the Alaska Department of Natural Resources, local governments, and Alaska Native corporations.

3. How was eXtension used?

One agent says he uses the eXtension search engine on a daily basis and recommends its use to his Master Gardener volunteers. One AFES researcher has learned to utilize eXtension as well.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	15040	283229	3890	6639

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	2	12	14

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target 1: Faculty will provide non-food agricultural and horticultural workshops, short courses, classes, field days, and conferences including IPM.
 Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Output Target 2: Faculty will provide non-food agricultural, horticultural and pest management information through one-on-one consultations and consultations with other organizations (in contact hours).

Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Output Target 3. Horticultural crop research will concentrate on home and commercial varieties appropriate to Alaska. Publications and presentations are the output measures.

Year	Actual
2012	5

Output #4

Output Measure

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

Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Output Target 5. Turf research will continue including variety selection and expansion into multiple use. Output measure will be publications, presentations and technology transfer.

Year	Actual
2012	6

Output #6

Output Measure

- Output Target 6: Faculty will provide agricultural and horticultural workshops, short courses, classes, field days, and conferences including IPM.

Year	Actual
2012	160

Output #7

Output Measure

- Output Target 7: Faculty will provide agricultural, horticultural and pest management information through one-on-one consultations and consultations with other organizations (in contact hours).

Year	Actual
2012	4882

Output #8

Output Measure

- Output Target 8. Controlled environment horticulture will focus on controlled environment

technology and technology transfer and appropriate crops and best management practices for crop production in specific environments. Output measures will be publications and presentations.

Year	Actual
2012	313

Output #9

Output Measure

- Output Target 9: Focus will be on best management practices for crops and variety evaluation. Output measure will be publications.

Year	Actual
2012	2

Output #10

Output Measure

- Output Target 10: Focus will be on best management practices for livestock management and production. Output measures will be publications and presentations.

Year	Actual
2012	15

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Outcome Target 1: Increase non-food agricultural and horticultural producers' ability to understand and assess optimum production practices.
2	Outcome Target 2: Increase non-food livestock producers' ability to understand and assess optimum production practices.
3	Outcome Target 3: Increase the number of activities that monitor and control invasive species.
4	Outcome Target 4: Increase the number of adopters of new technology and management practices.
5	Outcome Target 5: Increase agricultural and horticultural producers' ability to understand and assess optimum production practices.
6	Outcome Target 6: Increase livestock producers' ability to understand and assess optimum production practices.
7	Outcome Measure 7: Increase agronomic crop producers ability to understand and assess best management practices. Outcome measure is number of producers adopting change.
8	Outcome Measure 8: Increase livestock producers' ability to understand and assess optimum production practices for food animal production.
9	Outcome Measure 9: Improve commercial and home horticulture best management practices. Measure is number of individuals adopting practices.
10	Outcome Measure 10: Increase producers' knowledge of promising new horticultural crops. Outcome measure is number of producers assisted.
11	Outcome Measure 11: Improve and access producers' ability to understand and assess optimum soil. Measure will be workshop participants.

Outcome #1

1. Outcome Measures

Outcome Target 1: Increase non-food agricultural and horticultural producers' ability to understand and assess optimum production practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska's need to diversify from extractive industries led to a Congressional appropriation on new crop research, which resulted in a budding new industry. Research conducted at the Fairbanks Experiment Farm has shown that peonies can be produced in Alaska when no other peony is available in the world.

What has been done

Research and Extension are providing best management practices including advice on cultivation, management, post harvest handling, packaging, distribution and marketing. Information is being provided on composting, soil amendments and disease management. Publications are online, articles, blog posts, posters and presentations are available. Extension has provided support to 70 potential and existing growers with site visits, soil analysis, weed management presentations and grower consultations. Herbicide and nonchemical weed control options were tested for effectiveness and cost and results presented at two peony conferences.

Results

Alaska is poised to enter the competitive world flower trade with Anchorage, AK being the fourth largest air cargo transport hub in the world. There are 67 growers in Alaska and 101,000 peony plants in the ground to date. In 2012 nearly 25,000 Alaskan fresh cut stems were sold in Canada, Taiwan, Hawaii and the contiguous 48 states. Prices average from \$2.75 wholesale to \$5.85 retail. Projected yield by 2015 is over one million stems, which will inject approximately \$2,750,000 into the Alaska economy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
----------------	-----------------------

205	Plant Management Systems
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Outcome Target 2: Increase non-food livestock producers' ability to understand and assess optimum production practices.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska hosts thousands of visitors every year. The state also imports most of its food and many horticultural and agricultural products, so it remains vulnerable to imported pests. Retail sales of plant materials contaminated with a variety of pests continue to challenge the state. Invasive weed infestation can reduce land values and agricultural productivity, and negatively impact recreation, tourism and subsistence harvesting. Improving citizen, farmer and land manager ability to assess pest management practices is critical.

What has been done

Agents and integrated pest management (IPM) staff hosted 115 workshops and presentations and worked with producers, agencies and individuals to identify pests and reduce impacts. New outreach included a university class on recreational impacts and a partnership with Anchorage

schools that included student research on moose consumption of the European bird cherry tree. Pest technicians trap for invasive species of concern, including the gypsy moth and emerald ash borer. An invasive species conference brought together researchers, agencies and citizens statewide in Anchorage to discuss research and prevention efforts. CES trained 126 commercial pesticide applicators and 23 weed-free forage inspectors.

Results

After the invasive species conference, participants agreed to increase efforts to manage and monitor invasive species. Evaluations showed that participants valued networking with representatives of other agencies and organizations. The annual conference helps bring agencies and individuals to help coordinate invasive plants response and research. Agents developed a publication on bird vetch control because of public and private concern about that invasive plant. The recreation class identified and inventoried invasives along three trails in Alaska, near Gulkana, Anchorage and in Prince William Sound. Nearly 12,000 contacts were made by the IPM staff and additional contacts were made by faculty through educational workshops. Pesticide applicator certification, which is required by the state of Alaska, results in safer and more effective application of pesticides. Of the 97 people who took the state's challenging certification exam, 54 passed. The weed-free forage program helps prevent the spread of noxious weeds to natural ecosystems and provides a higher value market opportunity for farmers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A researcher is using technology to define an animal unit appropriate to Alaska's environment and to quantify grazing activities in small pastures. The knowledge gained may provide information useful in the debate between federal agencies and Western farmers and ranchers regarding the use of public range land. The Bureaus of Land Management and Fish and Wildlife have made statements that the riparian ecosystem is in danger from overgrazing.

What has been done

Satellite collars enabled GPS tracking to map distinctive grazing patterns of cattle in Palmer, AK. Tracking collars have been adapted with rapid chips, which give readings every second instead of the standard tracking of every 10 minutes. Satellite collars currently in use cost approximately \$4,000 each. The adapted collars used in this study cost \$250 each and utilize 4 D-cell batteries making this technology more affordable. Currently this type of collar works well with cattle that are not free ranging.

Results

Satellite data suggests that cattle spend little time in riparian areas. Researchers made the common sense observation that since wet areas soften their hoofs, cattle spend only the time necessary in wet environments. If conservationists wish to limit or abolish the use of public lands for cattle grazing they may need to provide a different justification.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
216	Integrated Pest Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Outcome Target 5: Increase agricultural and horticultural producers' ability to understand and assess optimum production practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is steadily growing interest in small farms, Community Supported Agriculture (CSA) groups and producers interested in supplying grain products. Interest in locally grown food has increased with the recognition that Alaska's three-day grocery supply is heavily dependent on expensive transportation. There is also growing concern about the quality of imported, commercially produced food.

What has been done

Educational opportunities and research-based practical advice tailored to Alaska are offered annually to producers to help improve the economic viability of grower operations. A recent event hosted by CES and AFES was held at the Fairbanks Experiment Farm for small grain producers. Fifty people attended a workshop to learn best management practices and compost advice from AFES researchers. The CES kitchen coordinator presented best uses for barley seed and flour and passed out recipes. Articles and blogs were published about the event.

Results

The experiment farm, which has researched grains since its inception in 1905, successfully developed a grain that does well in the short growing season and cold soils of Alaska. Sunshine barley can be purchased now from the Alaska Division of Agriculture's Plant Material Center for \$85 for 50 lbs. With ¼ lb of seed, a 100-square foot plot can, in a good year with an experienced grower, produce a 5-10 lb yield. Local industries are now using Alaska grown Sunshine barley to mill into flour. It is also being pelletized for food and straw for animals, and distilled into beer and vodka. CES hosted a grain growers meeting in FY13.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #6

1. Outcome Measures

Outcome Target 6: Increase livestock producers' ability to understand and assess optimum production practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Consumers increasingly are seeking locally produced, high quality, chemical and hormone-free meat. Reindeer perfectly fill the bill. They are uniquely adapted to the northern climate eating less during the cold season. Reindeer are also an ideal option for 4-H market livestock programs. They are good natured animals responding well to intensive human contact typical of 4-H and FFA livestock projects and are hardy, doing well on commercially available feeds and in farm settings.

What has been done

Students, in 4-H market livestock programs, participate in sessions covering all aspects of reindeer husbandry including health, handling, feeding & nutrition, herd management, and facilities design & maintenance. These hands-on sessions provide a sound knowledge base for participating youth and their families. Under the guidance of experienced reindeer handlers, students begin the fundamental work of socializing their calves and building a healthy and safe human-animal relationship. After the completion of these sessions the students are given charge of their animal, which they raise at their own facilities for the next year. Like other market animals, they are managed in a manner consistent with the 4-H livestock program guidelines and shown at the state fairs. They are sold in the market auction at 15 months of age, by which time they are of slaughter size.

Results

Almost every major meat distributor in Alaska desires to buy reindeer meat. Reindeer meat is valued because it is tender and tasty while rich in protein, high in minerals and low in fat and cholesterol. Even though reindeer seems expensive at \$25 lb, an average serving is 4 ounces. Market possibilities are high due to demand. Twenty youths in Kenai and 16 in Fairbanks contacted the AFES reindeer herder about starting a 4-H market livestock project with reindeer. The Kenai youth raised their own money to bring him to town. Parents provided housing, meals and local transportation. He presented on raising and managing reindeer and helped them develop a 4-H project. One youth in Kenai and 6 in Fairbanks have purchased calves and remain in close contact with AFES personnel. Discussions are under way to pursue collaboration with CES.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
305	Animal Physiological Processes
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
601	Economics of Agricultural Production and Farm Management

Outcome #7

1. Outcome Measures

Outcome Measure 7. Increase agronomic crop producers ability to understand and assess best management practices. Outcome measure is number of producers adopting change.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	53

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alaska imports most of its food supply. Educational opportunities and research-based practical advice offered to producers will help new producers enter the market and improve the economic viability of existing operations. The management of farm nutrients, pest scouting and pesticides also will improve financial sustainability of farm operations while making producers cognizant of environmental concerns.

What has been done

After a potato farmer suffered significant losses due to bacterial ring rot, an agent wrote and distributed a bulletin with prevention recommendations. The Delta Farm Forum offered information about a barley flour mill, cooking with barley and food processing regulations. The Harvest Wrap-Up brought AFES and ARS researchers together with farmers to discuss the past crop season and current and future research. Produce Growers Conference included presentations on weeds, diseases and pesticide resistance. Nutrient and pest management plans were provided to producers associated with EQIP long-term contracts.

Results

Because there is no known pesticide to control ring rot, the disease is managed through proper sanitation, the use of clean, certified seed and vigilance. A dozen of the state's largest potato farmers in Palmer and Delta Junction indicated that they changed their disinfecting practices as a result of the ring rot publication. Through the EQIP program in Delta Junction, 25 participants applied pesticides and nutrients at the specified rates and were educated in weed identification and soil sampling. Five producers at the Harvest Wrap-up have decreased their use of herbicides based on a study that showed herbicides degrade at a slower rate in Alaska's environment. Produce Growers Conference evaluations showed that eight participants of past conferences said they changed their practices regarding variety choice, pesticides and pest management, soil testing and herbicides.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Measures

Outcome Measure 8: Increase livestock producers' ability to understand and assess optimum production practices for food animal production.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	410

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock production enterprises in Alaska provide meat and dairy products for commercial markets as well as agritourism enterprises in this state. Educating livestock producers will

improve their ability to assess production practices. The program goal is to facilitate the development of management strategies to support sustainable, high-latitude livestock production in species ranging from poultry to ruminant animals.

What has been done

CES/AFES livestock specialist taught workshops on nutrition, genetics, lactation, reproduction, herd health and disease in seven Alaska communities. Sixty hours were logged consulting with livestock producers and organizations around the state. CES and AFES organized a Sustainable Livestock Conference attended by 80 livestock producers and processors individuals to increase in-state red meat production. Agents taught six classes to 260 individuals with information about raising chickens and egg production and a DVD on raising egg layers in the winter was created and distributed.

Results

Participants in the livestock workshops provided ideas on what is needed for livestock research and outreach. Participants in artificial insemination classes in three communities demonstrated knowledge gains with pre- and post-test scores averaging 31 and 72 percent respectively. Pre- and post-test scores for a physiology workshop were 18 percent and 67 percent. Sustainable Livestock Production Conference participants included livestock producers and processors. They developed ideas about how Alaska producers could provide a greater share of the red meat consumed in our state. A team will consider ideas with the goal of developing better teaching, research and outreach efforts. The conference resulted in a follow-up conference in FY13 about grazing management and an advisory group for livestock fiber producers. Participants in chicken classes learned how to provide their own meat and eggs safely.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #9

1. Outcome Measures

Outcome Measure 9: Improve commercial and home horticulture best management practices. Measure is number of individuals adopting practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	413

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Horticulture is the largest agricultural industry in Alaska amounting to 50 percent of cash receipts for all agricultural crops. Alaska imports most of its food and costs are high, particularly in rural areas. Dependence on imports poses a food-security risk if supply lines are interrupted. Teaching more residents how to garden or grow horticultural crops increases the quality of food available to consumers and lowers food security risk.

What has been done

Many composting and gardening classes include hands-on components. Three conferences target industry and home horticulture. Greenhouse and Nursery Conference provided information about fertilizer calibration, growing tips, variety selections and marketing. Sustainable Agriculture Conference highlighted solar greenhouses, community gardening, business strategies and plant varieties. The Peony Growers Conference included marketing ideas, CES and AFES presentations on soil testing, weed control options and updates on the phenology project and other research. Nutrient and pest management plans were provided to horticulturalists associated with EQIP long-term contracts.

Results

More than 180 Master Gardeners were trained and practiced the techniques they were taught. Eight months after taking the Anchorage class, all 15 respondents said they had used course information, including new varieties or plants, fertilizer practices and pest management techniques. A dozen participants of greenhouse conference incorporated recommendations on lawn care, fertilization, varietal selection as a result of previous conferences. Sixty-one participants of Sustainable Agriculture conference made changes in fertilization, marketing, pest management, grant writing and weed management as a result of previous conferences. CES worked with 142 high tunnel growers, who were educated in weed identification and soil sampling and improved soil conservation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #10

1. Outcome Measures

Outcome Measure 10: Increase producers' knowledge of promising new horticultural crops.
Outcome measure is number of producers assisted.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Growers in the agricultural non-food sector produce bedding plants, cut flowers, landscape ornamentals and forage. They face many of the same growing challenges as food producers, including a short growing season, cold soils and limited soil fertility. Research and outreach education help growers meet challenges and support new markets. Rhodiola rosea production has the potential of being highly profitable for growers.

What has been done

Rhodiola rosea is a high-value medicinal plant that is native to Siberia and thrives in cold regions. Its roots are used as an ingredient for sports drinks and in skin care products. Agents provided support to 22 Rhodiola rosea growers with site visits, soil analysis, weed management presentations and grower consultations. Greenhouse and nursery conference participants received information about growing rhodiola and a growers school offered hands-on training with experienced growers and information.

Results

Rhodiola presentations and grower meetings have contributed to modest beginnings of a new Alaska crop. As of summer 2012, 10 Alaska producers had planted commercial quantities of rhodiola, which has the potential to net a farmer \$25,000 to \$40,000 an acre. During the school, 20 potential rhodiola growers learned about plant and row spacing, weed control and nutrient needs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #11

1. Outcome Measures

Outcome Measure 11: Improve and access producers' ability to understand and assess optimum soil. Measure will be workshop participants.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	24

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Building Alaska Garden Soils project, funded by SARE, was designed to get Alaskans growing food in raised-beds and to motivate and educate local producers by teaching them how to build garden soils from locally available materials. A video, "Building Alaska Garden Soils from the Ground Up," is now a teaching tool that gives AFES and CES the opportunity to provide outreach to villages we don't have the personnel to reach. This is one more step toward food security for our state.

What has been done

Research focused on soil improvement methodologies, comparing nutrient availability. Producers in five different locations, representing each "region" of Alaska, built four raised-beds and filled them with locally manufactured soils. Two beds were fertilized with local organic nutrient sources and two beds were fertilized with conventional fertilizer. Using potatoes as an indicator crop, biweekly soil samples were evaluated for nutrient availability and potato yield data was collected. After soil data was analyzed, recommendations for further amendments will be given to the producers so they have a guideline for improving crop yields the following growing season.

Results

No longer do producers need to barge soil into the state at great expense. The use of local materials and education both provide a solid foundation for sustainable agriculture in Alaska communities. The research done to determine nutrient values of local materials will help producers throughout the state by identifying sources of important plant nutrients. With assistance

from UAF Cooperative Extension Service, soil workshops were held in Angoon and Bethel.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

The high cost of petroleum products and fertilizers are expected to impact the productivity and the economic viability of horticultural and agricultural operations in the state. The small number of agricultural staff working for Extension and the limited number of AFES or CES researchers present challenges to providing a supporting role for horticultural and agricultural production. Other challenges include the geographic distances between communities and high transportation costs involved in traveling to communities off the road system. The Fairbanks and Kenai area districts did not have a full-time agriculture and horticulture agent for most of the year so programming has decreased in both areas. The cool, rainy summer led to poor growing conditions and contributed to prime conditions for potato pathogens, which affected some producers' ability to market their products. The weather also contributed to increased pests and the incidence of disease in peonies grown in the Kenai area, resulting in the need for future increased disease management research and education for growers.

Since most basic research has been accomplished in the 48 contiguous states, there is little interest in funding work that benefits only one state. Alaska is a state still in desperate need of basic research. At a time when food security is a national priority and Alaska imports most of its food, it is hard to comprehend the decision to remove USDA's Agricultural Research Service entirely from the state. USDA Agricultural Research service closed in Alaska Spring 2012. The loss of ARS shut a door on a long history of research. According to ARS spokeswoman Sandy Miller-Hays in Washington, D.C., for every dollar spent on agricultural research the country sees a return on investment of \$10. UAF graduate students felt the pinch, as many worked for ARS and were mentored by ARS scientists.

The loss of appropriations through Congressional funds severely delayed the very positive outcomes of the new peony industry. Two remarkable attempts to secure peony research competitive funding failed, even though it had well represented nationwide consortium support and support from the floral industry.

The School of Natural Resources and Agricultural Sciences and the Agricultural and

Forestry Experiment Station are going through a reorganization and strategic reassessment. The School of Natural Resources and Agricultural Sciences, the Agricultural and Forestry Experiment Station and the Cooperative Extension Service at UAF will continue to serve the needs of the citizens of the State of Alaska.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

All of our Extension agents used surveys after our major conferences and many agents surveyed following individual classes. We are learning through surveys what areas interest clients for future programming and what they have used from previous workshops. Comments on the 2012 Sustainable Agriculture Conference evaluation led to programming for the 2013 conference, including sessions on soil fertility and nutrient management, weed management and alternative energy use on farms. Greenhouse and Nursery Conference evaluations in 2012 provided information on which presentations the participants found most useful and what information they have used from past conferences. A dozen participants of the greenhouse conference said they had incorporated ideas as a result of previous conferences. Subjects included lawn care, fertilization, use of varieties and plant care.

Sixty-one participants of Sustainable Agriculture conference made changes in fertilization, marketing, pest management, grant writing and weed management as a result of previous conferences. Livestock pre and post-tests demonstrated participants' gains in knowledge. Producers' Conference evaluations showed that eight attendees from previous conferences have used information from the conference. Produce Growers Conference evaluations showed that participants of past conferences said they changed their practices regarding variety choice, pesticides and pest management, soil testing and herbicides.

Key Items of Evaluation