

American Samoa Community College (ASCC)

Division of

Community and Natural Resources (CNR)

FY 01 Annual Report of Accomplishments & Results

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INTRODUCTION

American Samoa is submitting a joint Research and Extension report. This report covers activities supported by Hatch and Smith Lever funds. In addition, there are programs and projects that are joint efforts with Hatch, Smith Lever, Smith Lever 3-d, and Forestry funding. The other sources of funding are given under the “sources of funding” section. There were 28.65 FTE for FY 2001 supported by Hatch and Smith Lever and local funding for these two programs.

GOAL 1: AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

I. OVERVIEW

A comprehensive multi-faceted approach was implemented to insure the accomplishment of the goals and objectives of the planned programs. Programs and projects primarily focus on but are not limited to outreach activities such as workshops, demonstrations, farm visitations, and special events, such as fairs, field days, National Pig Week, Arbor Week, school presentations, and career days. As a result of these collaborative efforts, the local farmers tend to rely heavily on the Cooperative Extension Service (CES) to provide good quality seeds, pigs, disease resistant banana and taro planting materials, and to have solid, scientifically based information to assist their farming efforts. Many farmers have learned and adopted management skills and marketing knowledge as well, through non-formal education.

The Cooperative Extension Service and Agricultural Experiment Station (Research) led programs in the following areas:

- Vegetable Production
- Traditional Crop Production
- Swine Management
- Waste Management
- NxLevel® Agricultural Business/Entrepreneurship
- Medicinal Plants
- Pesticide Safety

Agricultural Experiment Station projects have been conducted in the following areas:

- Assessment of Honey Bees in American Samoa
- Fruit Fly Ecology and Quarantine Surveillance

CES and Research efforts have contributed tremendously to the success of agricultural production and the marketing of local produce. CES, in conjunction with Research, has been charged with executing programs that promote sustainable farming practices and diversified agriculture in the territory, with a strong emphasis on the marketing of local produce. For example, CES worked diligently with the local Farmers’ Cooperative to negotiate contracts with the local USDA School Lunch Program, protecting local farmers from competition from off-island bidders.

The Cooperative Extension Service and Agricultural Experiment Station of the American Samoa Community College (ASCC) Division of Community and Natural Resources have successfully accomplished many of the activities outlined in Goal 1 of the 5-Year Plan of Work. Through their collaboration on a variety of approaches, they have achieved the following outputs in 2001:

- 26 appearances and programs on local television news
- 564 farmers visited
- 34 educational programs (Farm Fair, Arbor Week, Pig Week, ASCC Career Day, field trips and tours)
- 45 presentations to schools, government agencies and independent farmers
- 4 Extension/Research non-scientific publications
- 4 educational visual aids/materials, video, poster
- 2 marketing directories for producers and local stores
- 26 workshops

Understanding of the traditional Samoan culture and knowledge of indigenous medicinal plant use is unfortunately beginning to disappear. Historically, the Samoan people used local plants to treat a wide variety of ailments long before Europeans arrived in the country. A medicinal plant garden has been established at the Agricultural Experiment Station in order to provide a demonstration site for traditional healers and students, in order to increase awareness and highlight the potential economic importance of these natural resources.

Bee-keeping has never been exploited as a money-making enterprise in the territory due to lack of experience, but its proven economic potential in the mainland U.S. and other countries shows promise for American Samoa as well. Because the bee-keeping project is in its early stage of development, breeding, observation and evaluation, more awareness programs are being devised to increase knowledge and skills for indigenous farmers. An assessment of the impact of this program will be included in the next reporting period.

Fruit flies are responsible for more than fifty percent of the breadfruit and guava crop damage in the territory, according to earlier research. Because little is known about fruit flies of American Samoa, research is now focused on local species, including their phenology, host ranges, and natural enemies. The two most economically important fruit fly species in the territory are *Bactrocera kirki*, which is relatively abundant throughout the year, and *B. xanthodes*. Two species of parasitoids were found attacking the immature stages of flies. These discoveries are now serving as the basis for further observation and surveillance, but fortunately there have been no exotic fruit flies detected in 2001.

Local farmers seem to be somewhat hesitant to try newly introduced ideas and exotic species of crops. Integrating new strains so that they might maintain the existing markets and increase production requires more than one approach. Integrated approaches to heightening the awareness of the community of the potential of these crops should utilize TV programs, publications, visitations, and community-based workshops.

The most reliable and honest assessment to obtain feedback from the community is the farm visitation record and documentation based on focused group discussions at the end of farmers' workshops. Written evaluations are not always reliable due to farmers' literacy limitations and hesitance to commit to a written opinion. However, on-farm conversations and interacting on a one-to-one basis have proven successful and have provided more privacy, even though this process is time consuming.

A & B. Outputs/Outcomes

1. Number of farmers completing all forms of non-formal education programs and presentations and adopting new practice or technology.

Non-formal Ed		Adopting New Practice		
Baseline	Target	Actual	Target	Actual
2000	120	355	30	46
2001	150	378	45	141
2002	180		60	
2003	190		72	
2004	250		90	

2. Number of materials, including newspaper articles, fact sheets/brochures and television programs produced on topics related to improving productivity and global competitiveness.

Baseline	Target	Actual
2000	20	28
2001	24	36
2002	29	
2003	35	
2004	42	

3. Total number of farmers loaned tools/equipment from local businesses, Department of Agriculture and ASCC Land Grant.

Baseline	Target	Actual
2000	12	23
2001	14	19
2002	17	
2003	20	
2004	24	

4. Number of farmers buying seed cultivars, fertilizers and pesticides from local businesses, Department of Agriculture and ASCC Land Grant.

Baseline	Target	Actual
2000	25	120
2001	30	153
2002	36	
2003	43	
2004	52	

5. Number of farmers interviewed regarding their attitude towards marketing and their marketing practices.

Baseline	Target	Actual
2000	40	53
2001	48	61
2002	58	
2003	69	
2004	83	

6. Number of Organizations/groups given assistance in developing gardens.

Baseline	Target	Actual
2000	2	5
2001	3	4
2002	4	
2003	5	
2004	7	

7. Number of farmers receiving financial assistance to develop existing enterprise and increased production.

Baseline	Target	Actual
2000	3	3
2001	5	6
2002	7	
2003	8	
2004	10	

E. Financial and Human Resources:

8.5 FTE

Hatch Federal	\$105,981
Hatch Local	\$33,940
Smith Lever Federal	\$103,118
Smith Lever Local	\$25,433
Multistate Research Funds Federal	\$3,134
Multistate Research Funds Local	\$1,450

II. KEY THEME: ALTERNATIVE AGRICULTURE

A. Activity:

Medicinal plants have a long history of use in Samoa for treating a variety of ailments. However, as in other traditional cultures, maintaining indigenous knowledge of plant uses is difficult in the face of increasing Westernization. In an area with limited natural resources such as American Samoa, these plants have the potential to make significant contributions to the local economy, especially as they attract the attention of major pharmaceutical companies. The Cooperative Extension Service's Forestry Program continues to be interested in identifying traditional healers, documenting the abundance and diversity of existing medicinal plants, and helping local people establish a market for their medicinal plant products. In 2001, with assistance from WSARE, a two-day workshop entitled, "Medicinal Plant Crops and Product Development for U.S. Markets," led by two University of Hawaii botanists, was conducted at the Research Experiment Station. Additionally, two University of Hawaii students completed internships in 2001 with the Forestry Program, focusing on documenting traditional knowledge, developing signs for the demonstration medicinal plant garden, and producing a poster documenting traditional plant uses, together with identifying photographs and scientific and common English and Samoan names for each plant.

B. Impact:

The 20 participants in the medicinal plant workshop are now better informed as to the quality standards expected by U.S. nutraceutical and pharmaceutical companies. They also are better informed about marketing opportunities both locally and overseas, and the varying regulations that may apply.

The continuing development of the medicinal plant garden continues to attract the attention of not only local healers, but is also a favorite field-trip destination for elementary and high school students, resulting in an increased awareness of the historical and potential economic significance of these natural resources.

One of the University of Hawaii interns, now a graduate student at Oregon State, will be returning to intern with the Forestry Program in 2002, and will continue to focus on medicinal plants as non-timber forest products.

C. Source of Federal Funds: Smith-Lever and other Federal Funds

D. Scope of Impact: State-Specific

II. KEY THEME: APICULTURE

A. Activity:

Small scale bee-keeping could help American Samoan farmers increase income through honey and wax sales while improving crop yields by increasing pollination. Importing queens risks introducing exotic bee diseases or pests that could hinder a nascent cottage industry. But feral honeybees, *Apis mellifera*, introduced in a failed experiment decades ago, are abundant. As opportunities arose, feral honeybee colonies were collected from hollow trees, between house walls, and swarms. They were placed in hives at the Agriculture Experiment Station for observation and evaluation. Productive colonies will be retained and multiplied until there are enough colonies to use for demonstrations and training.

B. Impact:

Research will have a better understanding of the potential for honey production in the next reporting period.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: INVASIVE SPECIES

A. Activity:

Fruit flies are a major constraint to increasing production of many fruit crops in American Samoa. Earlier research found that typically more than half of breadfruit and guava crops is destroyed by fruit flies. Little is known about the fruit flies of American Samoa. Our research seeks to determine the species of fruit flies occurring in the territory, their host ranges, phenology, and natural enemies as an essential prerequisite for developing farm-level or area-wide management strategies.

B. Impact:

Year-round trapping and host fruit collections identified four species of fruit flies occurring in American Samoa. Host range studies based on the fruit collections found 13 wild and cultivated fruits to be important fruit fly hosts in the territory. In addition, two species of parasitoids were found attacking the immature stages of the flies, one of which appears to be quite effective, killing over half of the fruit flies developing in guavas. Of the two economically important fruit fly species, *Bactrocera kirki* appears to be relatively abundant throughout the year. The other economically important species, *B. xanthodes*, showed very weak response to the attractant used in the traps, so its phenology will be harder to determine. Based on the large numbers found emerging from breadfruits in the host range study, however, it is expected that the abundance of *B. xanthodes* throughout the territory will be closely tied to the fruiting phenology of breadfruits.

Fruit flies are also a concern from a quarantine standpoint. Hawaii and other islands which trade with American Samoa have fruit fly species that are not present in American Samoa and which, if accidentally introduced, could cause enormous damage to agriculture. The trapping network and periodic host fruit collections on the main island of Tutuila are designed to detect any accidental introductions of exotic flies to allow eradication to be undertaken before a population can become established. Fortunately no exotic fruit flies were detected in 2001.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: TROPICAL AGRICULTURE

A. Activity:

Samoan farmers traditionally have used shifting cultivation and monocropping systems. Due to population pressures forcing many people to farm in small parcels of communal lands, the Cooperative Extension Service (CES) tried hard to insure that vegetable production and traditional crops such as taro and bananas were maintained in a more sustainable manner. CES took advantage of every possible avenue to reach the community. Today's system of agriculture in the territory is basically mixed cropping. CES was involved in maintaining small multiplication plots of taro and banana disease resistant cultivars to distribute to the farming community. Workshops were conducted by the extension agents in the villages with the intent to promote sustainable agriculture with emphasis on marketing. CES felt it would be more effective and more convenient for the isolated farmers to have these workshops in the villages with the support of the mayors. Several programs were aired on KVZK-TV, and the release of Extension/Research publications drew attention that helped some farmers to obtain better planting materials for the future.

B. Impact:

Since the local farmers took control of the School Lunch program, the Cooperative Extension Service wanted to ensure that quality and consistency were maintained to avoid outside competition. This was done through farmer workshops and awareness programs on KVZK-TV. About 34 participants attended the Banana Production Workshop in which all participants had hands-on training in corm and bit preparation. As a result, 81 farmers received at least 1 or 2 disease resistant banana suckers (Goldfinger, Ducasse, etc) and taro corms (Filipino & Palauan cultivars) from CES multiplication plots. These indicators show increased understanding of farmers by accepting newly introduced cultivars of crops and improved techniques. These efforts have also motivated the Western District Governor to order all village mayors on the western side of the island of Tutuila to ensure that every household has some bananas, yams, taro, and even 'ava, *Piper methysticum*, planted in their backyards. In September 2001, the district governor indicated that follow-up visitations would be held within 6 - 12 months to monitor the progress.

C. Source of Federal Funds: Smith Lever

D. Scope of Impact: State specific

Goal 2: A SAFE AND SECURE FOOD AND FIBER SYSTEM. TO ENSURE AN ADEQUATE FOOD AND FIBER SUPPLY AND FOOD SAFETY THROUGH IMPROVED SCIENCE BASED DETECTION, SURVEILLANCE, PREVENTION, AND EDUCATION

EXTENSION

The programming for this goal in American Samoa is covered under the 3-d Food Safety and Quality (FSQ) initiative and EFNEP (Expanded Food and Nutrition Education Program). Since there are no formula funds used for this goal, this goal was not addressed in the plan of work, and therefore, not reported on here. At this point in time, there are no researchers having responsibilities relating to food safety and food security.

Goal 3: A HEALTHY, WELL-NOURISHED POPULATION

I. OVERVIEW

The traditional American Samoan society is communally based. This means the extended family is prevalent, and people share their resources. Normally, food benefits from federal food programs and produce from family gardens is shared within family groups. The traditional diet consisted of fish, pork, chicken, root crops, greens, and fruit, with coconut cream added to flavor foods. Today, animal protein and starches make up the bulk of the local diet, as well as an increasing amount of imported food.

The goal of the 5-Year Plan of Work is to increase the production and consumption of locally grown nutrient dense fruits and vegetables through demonstrations, offering workshops, assisting with gardening, developing and promoting recipes, tours of ASCC demonstration plots and vegetable gardens, and providing seeds, seedlings, tools and fertilizers to church groups, farmers, food stamp and ES-WIC clients, schools and other youth groups. An integrated approach to fruit and vegetable productions incorporating locally grown produce in the diet was used to help accomplish this goal. During the reporting period, programs were presented in villages, schools and appropriate government offices. Food demonstrations used recipes with locally grown produce. Using local produce as part of the food stamp allocation was promoted with demonstrations of recipes using fruits and vegetables. Educational handouts on the Pacific Food Guide Pyramid, recipes, “Team” nutrition, and “Five-a-Day” materials were given to food stamp recipients, students, teachers, and other clients. In-school programs emphasized the production and consumption of local fruits and vegetables with gardening projects. Seeds and seedlings were free for the people participating in the programs. Many food stamp clients commented that they are using the recipes and nutrition ideas to reduce the amount of fat in their family meals, increase their use of local produce, and get more from their food stamp dollars.

- 777 people completed vegetable gardening programs

- 138 additional people increased their knowledge of vegetable gardening
- 29 new vegetable gardens were started
- 233 people completed fruit production programs
- 650 new fruit trees were planted
- 233 people increased their knowledge of fruit production
- 1500 people completed fruit and vegetable related food, nutrition and food safety education programs
- 1500 people increased their knowledge of the importance of fruit and vegetable consumption, including how to select, prepare, safely handle and store produce
- 65% of people ate one or more fruits daily
- 71% of people ate two or more vegetables daily
- 2150 educational handouts on the Pacific Food Guide Pyramid, recipes, “Team” nutrition, and “Five-a-Day” materials were distributed
- 50 fact sheets on tree pests and 50 posters on land use distributed at the Forestry Division’s greenhouse

E. Financial and Human Resources:

5.75 FTE

Hatch Federal	\$90,841
Hatch Local	\$29,029
Smith Lever Federal	\$68,745
Smith Lever Local	\$16,955
Multistate Research Funds Federal	\$2,090
Multistate Research Funds Local	\$967

II. KEY THEME: HUMAN NUTRITION

A. Activity:

Agriculture Extension agents, CYFAR contacts, Forestry extension agents and 4-H extension agents offered many workshops and demonstrations about plant propagation, soil preparation and management, pest and disease control, fertilizer application, composting, and harvesting and marketing of produce. The Agriculture Extension division of the Cooperative Extension Service (CES) provided vegetable seeds and seedlings, plant materials and tools for the demonstrations. Vegetable seeds and starter trays distributed through the gardening programs included bak choy cabbage, cucumber, string bean, corn, white radish, green onion, leaf lettuce, taro (leaf), green pepper, tomato, swamp cabbage, sweet potato, pumpkin, eggplant, chili pepper, watercress, chives, and kohlrabi.

The CES Forestry Division provided fruit tree seedlings and assisted with demonstrations on planting and caring for the trees. The seedlings included avocado, citrus lemon, citrus lime, citrus orange, papaya, soursop, mango, mountain apple, guava, cocoa, chestnuts, *Rollinia*, and “Seasea” (a traditional medicinal bush).

Major collaborators for this activity included the American Samoa Department of Education, Department of Health, Department of Agriculture, local parent-teacher associations, Americorps volunteers, and the Diabetic Association. This collaboration has solidified working relationships with ASCC’s partners, creating stronger collaboration on other programs as well. In fact, one of

CES's commitments is to assist every interested member of the Diabetic Association to attain better nutrition and more physical exercise.

B. Impact:

There were 650 fruit tree seedlings distributed, and it is estimated that most of them were planted. Information was given on pest and disease control, including 50 fact sheets on tree pests and 50 posters about land use distributed to students and teachers visiting the Forestry greenhouse. 233 students, teachers and farmers completed fruit production programs and increased their knowledge of fruit production. 915 students, teachers, parents and farmers completed vegetable gardening programs and increased their knowledge of vegetable gardening. Seventeen of the farmers were members of the Diabetic Association. Program participants helped develop 29 new gardens, with 13 located at local schools. Harvested produce from the school gardens was used to provide wholesome and nutritious meals for the children and parents. Excess produce was sold to fund other projects for the other students. Many of the students and parents have started vegetable gardens on family lands or in small backyard containers. There are now 81 small-scale vegetable farmers in American Samoa. One of the farmer-participants in the program has been able to effectively utilize his new knowledge of farming fruits and vegetables. He farms about 15 acres, which is a large farm in American Samoa. He provides produce about once a week to the Department of Education for the USDA School Lunch Program. Many other farmers have been able to sell their produce at roadside stands, as well as at the Farmers' Market in the downtown area.

In Manu'a, the Palauan taro that was distributed at the beginning of the project has now expanded from the island of Olosega to neighboring Ofu. The taro is now replacing the Samoan taro variety, which was essentially wiped out by taro leaf blight several years ago. Families have started new taro plantations using the Palauan cultivars from the Olosega School taro multiplication plot.

Media coverage of the island-wide vegetable gardening projects was seen on KVZK TV and appeared in the Samoa News newspaper. The media campaign has drawn attention to the school district's agriculture programs, despite their not being an area of emphasis within the Department of Education. It is hoped that this attention will help CES expand its "Ag in the Classroom" programs within local schools in the future.

C. Source of Funding: Smith-Lever and other Federal Funds

D. Scope of Impact: State-specific

II. KEY THEME: HUMAN NUTRITION

A. Activity:

The Food Stamp Program is one of many long-running nutrition programs in American Samoa. The first five business days of each month, CES Nutrition agents continue to provide services for food stamp recipients. Through lessons, songs, games, fact-sheets, recipes, and cooking demonstrations using local ingredients from each of the five food groups, clients are receiving nutrition education. Emphasis is placed on eating more fruits and vegetables, reducing

fat and salt consumption, and eating a variety of different foods. Educational handouts on the Pacific Food Guide Pyramid, recipes, “Team” nutrition, and “Five-a-Day” materials were given to food stamp recipients, students, teachers and other clients. When the Food Stamp staff members distribute the coupons immediately following each nutrition session, attendance rises tremendously.

B. Impact:

There was an average of 126 clients who attended the FY 2001 nutrition classes during each Food Stamp distribution week. These clients learned about nutrition, food safety, and how to select and prepare fruits and vegetables. They also learned safe storage and handling of produce. Many clients commented that they are using the recipes and nutrition ideas to reduce the amount of fat in their family meals, increasing their use of local produce, and getting more from their Food Stamp dollars.

Approximately 2,150 educational handouts were distributed to food stamp recipients, students, teachers, and clients, increasing their awareness of balanced nutrition. Participants in the Women, Infants, and Children (WIC) program also completed information and activity lessons related to the “Five-a-Day” program. There were also 32 schools where the “Five-a-Day” program was led. Total client participation was approximately 1500 people during FY 2001. According to food recalls and verbal responses, 65% of clients eat one or more fruits each day, and 71% eat two or more vegetables each day. This is not necessarily a full serving of fruits and vegetables.

In September 2001, a team of six representatives from Public Health, Department of Education, Social Services, and ASCC-CES attended the National Nutrition Meeting in Dallas, TX. Upon their return, a Nutrition Coalition was organized for the territory. It includes representatives from the above agencies, as well as the Lyndon B. Johnson Tropical Medical Center, the ASCC Nursing Department, and the Diabetic Association. It is hoped that this inter-agency partnership will further efforts to educate the public about the importance of balanced nutrition.

C. Source of Funding: Smith-Lever

D. Scope of Impact: State-specific

II. KEY THEME: HUMAN HEALTH

A. Activity:

Presentations about safe food handling, storage and preparation were part of the training for childcare providers in April. During the month of May, the “Sope” hand-washing posters arrived in American Samoa, and were distributed to all government agency offices, public buildings, schools, and daycare centers. September was “Food Safety Month.” A food safety video, developed by the CES Food Safety agent, was played on local television several times each week. Two high schools invited the CES Families, 4-H and Nutrition division to make presentations about safe food handling, storage and preparation during September.

B. Impact:

After hearing the CES presentation on food safety, some students have reported they are now asking local establishments that sell tuna and egg salad sandwiches, “Why are these not in a cooler?” An estimated 1,000 viewers watched the food safety video on television. There were at least five letters to the editor of the Samoa News during that time commenting about food safety and the concepts covered in the video. Now that awareness has increased, more people are calling the paper, radio, and CES about cases of food poisoning, and requesting more information. This may help CES work more closely with the Department of Health to improve the safety of fast food sold on the roadside and in markets in the territory.

The owner of the ABC Day Care center shared her food safety experience with her family and employees. The principles she learned in the workshop on safe food handling, storage and preparation made her determined that her family and childcare workers would take extra caution with food handling. She was thankful for what she learned about food safety issues, such as avoiding food poisoning by following rules in food preparation, keeping food at the proper temperature, and washing hands in soap and water. She joked about how frustrated everyone is when she makes sure they wash their hands before handling food, and especially when she sends them away from the dinner table to wash their hands with soap. Although it is difficult for her and those around her to change from former poor habits, a change is taking place within her family, as they develop better food safety habits around the dining table. Employees at her day care center are also teaching the children to wash their hands before receiving their food.

A month after distribution of the “Sope” posters, a staff member visited the Food Stamp restroom, and noticed the “Sope” poster on the wall above the sink. She also noticed that liquid antibacterial soap was placed neatly on the sink. Normally soap is rarely seen in public restrooms in American Samoa.

C. Source of Funding: Smith-Lever

D. Scope of Impact: State-specific

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT. ENHANCE THE QUALITY OF THE ENVIRONMENT THROUGH BETTER UNDERSTANDING OF AND BUILDING ON AGRICULTURE'S AND FORESTRY'S COMPLEX LINKS WITH SOIL, WATER, AIR, AND BIOTIC RESOURCES.

I. OVERVIEW

American Samoa is blessed with the two most species-rich ecosystems on earth: the tropical rain forest and, its marine equivalent, the coral reef. Furthermore, as an isolated group of oceanic islands, it is a natural laboratory for the study of evolution. Therefore, efforts to ensure greater harmony between agriculture and the environment assume a greater importance here than elsewhere. Outputs and outcomes of projects undertaken at the American Samoa Community College (ASCC) were directed towards impacts that would help ensure that ecosystems achieve a sustainable balance of agricultural activities and biodiversity. To accomplish this, the

Agricultural Experiment Station, Cooperative Extension Service, Forestry Service, and their partners focused on protecting, sustaining, and enhancing soil and water resources.

Because of limited resources in staff and budget, ASCC has concentrated on forming partnerships with other on-island federal agencies as well as local government agencies in fulfilling its mission. One prime example of such inter-governmental agency cooperation is the Interagency Piggery Management Council. Under the leadership of the ASCC Cooperative Extension Service, the following coordinate efforts to reduce the amount of effluent discharged by piggeries into streams: Natural Resource Conservation Service, Environmental Protection Agency, Coastal Management Program, and the AS Department of Agriculture. Their efforts served as a catalyst in implementing and expanding existing programs. For example, a NRCS-sponsored workshop inspired one farmer to implement a drip irrigation system with solid waste composting, funded in part through a Western Sustainable Agriculture Research and Education Program Farmer/Rancher Grant.

Biological control has long been the cornerstone of integrated pest management in American Samoa. When new crop pests arrive on the archipelago, usually through the action of commerce, they initially cause severe damage. Within a year or two, natural enemies, and sometimes abiotic factors, often reduce their populations. The success of natural enemies in American Samoa may be due to traditional farming methods such as intercropping and agroforestry, the limited use of expensive imported pesticides by subsistence farmers, and the proximity of virgin rain forest—which may contain alternative hosts and suitable habitats for natural enemies—to plantations. Sometimes, though, additional biological control agents are needed.

In 1998 the Manua Group of three inhabited islands experienced a severe outbreak of the Seychelles Scale insect on breadfruit, an important source of starch in the Samoan diet. The foliage of mature trees was blanketed by this tiny white insect, which feeds on leaf sap. Yield losses were compounded by large patches of black sooty mold, that thrives on the insect's exudate, thereby reducing photosynthesis. In cooperation with the South Pacific Commission and the AS Department of Agriculture, the Agricultural Experiment Station imported an extensively tested, host-specific coccinellid beetle to help control the scale. Over 150 beetles were released on 13 May 1999 in a heavily infested area on Ofu Island. A survey one-month later confirmed that the coccinellid predator was well established and breeding. Another survey one year later found that the infestation rate on Ofu Island was reduced by 96% while the infestation rate on adjacent Olosega Island was reduced by 99%. Returning visitors, who recalled the conspicuous and extensive infestations on village trees, were amazed to now find lush verdant foliage once again.

As the only land grant institution south of the equator, ASCC occupies a unique position in the USDA CSREES family. It successfully maximizes its modest resources by developing partnerships with other on-island federal agencies and with local government agencies. ASCC's leadership role in initiating such partnerships is recognized and appreciated by policy makers and the public. As long as this spirit of intra-governmental agency cooperation continues to enjoy administrative support, ASCC's impact on the community and on the environment will contribute towards a healthier, more self-sufficient lifestyle for all.

The Cooperative Extension Service and Agriculture Experiment Station have collaborated on the following efforts in order to disperse their research efforts to the public:

- 4 referred articles, technical reports, and poster sessions
- 10 non-technical publications, workshops, or broadcasts

E. Financial and Human Resources:

10 FTE

Hatch Federal	\$105,981
Hatch Local	\$ 33,940
Smith Lever Federal	\$120,304
Smith Lever Local	\$ 29,672
Multistate Research Funds Federal	\$5,223
Multistate Research Funds Local	\$ 2,418

II. KEY THEME: AGRICULTURAL WASTE MANAGEMENT

A. Activity:

The Cooperative Extension Service spearheaded the formation of the Interagency Piggery Management Council, an inter-governmental agency partnership between AES, USDA-NRCS, American Samoa EPA, the American Samoa Coastal Management Program, and the American Samoa Dept. of Agriculture. The IPMC's goals are to reduce the amount of effluent being discharged from local piggeries into streams, and to promote better swine husbandry among local farmers. Currently, local streams and mangrove areas are contaminated by bacteria associated with animal waste, the result of the practice of (illegally) building piggeries adjacent to waterways. The IPMC conducted a series of workshops addressing waste management, composting, and the threat of zoonotic diseases. The workshops were held for several different audiences, including religious leaders, village mayors, legislative representatives and local farmers. A total of 188 participants attended these workshops.

The IPMC also developed several publications to promote new management techniques, including a Samoan language poster illustrating a well-maintained piggery entitled, "Proper Pig Husbandry: Good for Us, Good for the Environment." An accompanying 8 ½ X 14" fact sheet in both English and Samoan was also produced and widely distributed to farmers and local high school and ASCC students.

CES also successfully applied for USDA-NRCS EQIP Educational Assistance funds in order to bring down two University of Hawaii Livestock Extension Specialists who are in charge of the UH Nutrient Management Project. These two Cooperative Extension agents presented several alternative nutrient management systems that had been successful for limited resource farmers in Hawaii.

B. Impact:

After working with the Agriculture Extension agents to develop his application, one farmer was successful in obtaining a \$5,000 WSARE grant to implement a drip irrigation nutrient management system. Using the knowledge gained from their meetings with the UH

extension agents, the Ag Extension agents worked with the NRCS Soil Technician and Engineer to help the client design an effective system that combined drip irrigation with solid waste composting.

The IPMC has, as a result of meetings with the UH extension agents, recognized the need to establish baseline data for stream health, to help farmers understand actual costs of production, and to conduct basic research on the efficacy of alternative systems in American Samoa before disseminating recommendations to the public. The UH extension agents are returning to American Samoa to set up demonstration sites with the assistance of NRCS EQIP funds.

The Agriculture Extension division of CES is better prepared to make nutrient management and composting recommendations to the general public and has seen an increase in information requests related to piggery construction as a result of their workshops. The 188 participants in the 2001 workshops reported increased understanding and awareness of the impact of animal wastes on human and environmental health.

C. Source of Federal Funds: Smith-Lever

D. Scope of Impact: State specific

II. KEY THEME: BIODIVERSITY

A. Activity:

In cooperation with the American Samoa Department of Commerce and the AS National Park Service, the AS Community College Agricultural Experiment Station visually surveyed the entire courses of three pristine and two impacted streams for fishes, snails, benthic invertebrates, and crustaceans. The findings were compared with a 1981 survey that employed electroshock sampling at up to four sites within 1 km of stream mouths. Near-daily readings of rainfall, stream height, pH, turbidity, dissolved oxygen, temperature, and salinity were taken along the lower reach of a moderately impacted stream to determine normal fluctuations of these parameters during various hours of the day and night. Several overnight drift samples were also collected.

B. Impact:

No impact to report this first year. An anticipated outcome will be to apply this and additional information towards identifying an indicator species from each level of the food chain in order to develop multimetric indices of stream health and water quality.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: BIOLOGICAL CONTROL

A. Activity:

Forestry, Entomology, and Plant Pathology divisions conducted surveys on Tutuila Island for damage inflicted on coconut trees, *Cocos nucifera*, by the rhinoceros beetle, *Oryctes rhinoceros*. A fungus, identified as the long-spored *Metarhizium anisopliae* var. *major*, was isolated from beetle larvae collected from breeding sites. Disease-free larvae were inoculated with this fungus or with a commercially available short-spored form of *M. anisopliae* var. *major*. The long-spored form killed all inoculated larvae, while the short-spored form killed less than 10 percent.

B. Impact:

Most areas surveyed had damaged foliage due to *O. rhinoceros* feeding, and some yield loss was predicted for the most affected locations. Though *M. anisopliae* var. *major* proved effective against *O. rhinoceros* larvae, the extent of its role in reducing beetle populations in American Samoa is unknown. In other countries the fungus against the larvae is usually used together with a more effective baculovirus against the adults. Because of a low estimated yield loss and lack of interest from growers (coconuts are a subsistence crop in American Samoa with a small local market) there are no immediate plans to pursue this strategy.

C. Source of Federal Funds: Hatch and McIntire-Stennis

D. Scope of Impact: State Specific

II. KEY THEME: BIOLOGICAL CONTROL

A. Activity:

Knowledge about the naturally occurring predators and parasitoids that help reduce pest populations can help in developing ways to conserve these beneficials and enhance their effectiveness against pests. Immature stages of key vegetable insect pests from farmers' fields and research plots were collected. These pests were reared in the laboratory to determine what species, if any, of parasitoids were attacking them in the field. Three species of parasitoids were found attacking the taro armyworm, *Spodoptera litura*, and three attacking agromyzid fly leafminers, *Liriomyza* spp. No parasitoids were found from two of the most important insect pests of cruciferous vegetables: the cabbage cluster caterpillar, *Crocidolomia pavonana*, and the diamondback moth, *Plutella xylostella*. In other parts of the world diamondback moth is attacked heavily by parasitoid wasps of various species, so it may be worthwhile to consider introducing a host specific parasitoid from elsewhere in a classical biological control program aimed at reducing diamondback moth populations in American Samoa.

B. Impact:

These natural enemy surveys are continuing and identifications of the parasitoids from taxonomic experts are expected during the coming year. Knowledge of which species of natural enemies are important in vegetable systems will enable research to be targeted at finding ways to conserve and enhance populations of these natural enemies in crops. Increased natural enemy impact can reduce damage from pests with little or no cost to farmers and without adverse effects on the environment.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: BIOLOGICAL CONTROL

A. Activity:

In 1999 the lady beetle, *Rodolia limbata*, was introduced from Australia to the island of Ofu in American Samoa by the Division of Entomology to help control a severe infestation of the Seychelles scale, *Icerya seychellarum*, on breadfruit and many other important plants. This lady beetle is known to attack only Seychelles and closely related scale insect species. It was introduced to many Pacific Island countries to control *I. aegyptiaca*.

B. Impact:

Follow-up surveys on Ofu Island the following year found that scale infestations had been reduced by 96%. The beetles had dispersed to adjacent Olosega Island and reduced the scale infestations there by 99%. Returning visitors, who recall the conspicuous and extensive infestations of village trees by white scale insects and the accompanying black sooty mold, were amazed to see lush verdant foliage instead.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: FOREST RESOURCE MANAGEMENT

A. Activity:

The divisions of Plant Pathology and Forestry surveyed 20 sites, totaling 8.8 ha, on Tutuila Island for brown root rot disease. This pantropical disease, caused by *Phellinus noxius*, has devastated plantations of rubber, cacao, hoop pine, mahogany, timber, and fruit trees worldwide. The goal was to determine the incidence and severity of brown root rot in both primary (relatively undisturbed) and secondary (disturbed) forests. Vegetation types included montane, ridge, slope, valley, coastal, and plain. *P. noxius* was found at 19 of 20 sites on 325 trees comprising 37 species in 30 genera and 22 families. The incidence of disease in each primary forest site was less than 5 percent. Three valley sites of secondary forest, however, had twice the number of diseased trees as all 15 primary forest sites combined. Infection centers were also larger at the secondary site.

B. Impact:

Population pressure is forcing American Samoans away from coastal lowlands and into primary forests in search of land for homes and farms. Newly planted fruit and ornamental trees may be at risk in areas cleared of *P. noxius*-infested trees. Forty-six host species have been recorded to date. The divisions of Plant Pathology, Forestry, and Extension now have a better understanding of the extent of the disease and its biology. Newspaper and television programs in English and Samoan are recommending options for people with brown root rot disease on their

land. A journal article, color brochure, and website publications will make this information available to other tropical countries.

C. Source of Federal Funds: Hatch and McIntire-Stennis

D. Scope of Impact: State specific

II. KEY THEME: INTEGRATED PEST MANAGEMENT

A. Activity:

Surveys of banana growers confirmed that the banana scab moth, *Nacoleia octasema*, is their major insect pest concern. The surveys found that despite the use of broad-spectrum organophosphate insecticides, damage levels from the moth larvae are often high, rendering a substantial portion of the fruit unmarketable. Two parasitoid species were found attacking the larvae of the scab moth, and numerous arthropod predators were found on the banana plants. These natural enemies could prove useful in helping reduce scab moth eggs and larvae if the relatively ineffective broad-spectrum insecticides could be replaced by products that are more effective against scab moth but less hazardous to the beneficials. Several such insecticides have been identified and improved application equipment has been obtained. The insecticides and application equipment will be tested in field trials in FY 2002.

B. Impact:

Development of reduced-risk management for banana scab moth promises to improve banana production by enabling farmers to produce high quality fruit while reducing production costs and environmental impact through improved application of less hazardous insecticides.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: INTEGRATED PEST MANAGEMENT

A. Activity:

Proper identification is key to effective pest management. A reference collection containing specimens of key pests can be an invaluable aid in their identification. As natural enemies are also collected and identified, these voucher specimens can serve as a reference for future efforts to use natural enemies to reduce pest problems. The American Samoa Community College Entomology collection has now been reestablished in a temperature and humidity controlled facility designed to exclude agents that can quickly destroy an arthropod collection. New specimens will continually be added to the collection as research continues and more pest and natural enemy species are identified.

B. Impact:

The collection is already serving as a crucial aid to pest and natural enemy identification and a repository for voucher specimens of arthropod species that have been subjects of ASCC

research or applied biological control programs. Several earlier misidentifications have been corrected and potentially useful biological control agents that occur on some of our islands but not on others have been identified as candidates for introduction into islands where they do not occur.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

II. KEY THEME: WATER QUALITY

A. Activity:

In cooperation with the local Natural Resource Conservation Service, the American Samoa Environmental Protection Agency, and the AS Power Authority (the local water utility), the AS Community College Agricultural Experiment Station collected 256 grab samples from 27 permanent streams representing 21 of 33 major watersheds on Tutuila Island, American Samoa. *In situ* tests included pH, turbidity, dissolved oxygen, temperature, and salinity. Laboratory analyses for levels of calcium, magnesium, potassium, and sodium were performed on all samples, while analyses for levels of inorganic phosphate, nitrate-N, and ammonium-N were performed on samples exhibiting high turbidity, low dissolved oxygen, or foul odor. This information, together with bacteriological test results performed by ASEPA, will be compiled into a database for display using GIS software and made available on the ASCC-CES Web page.

B. Impact:

No impact to report this year. An anticipated outcome is to supply policy makers, government agencies, and the public with accurate information on stream water quality for unbiased comparison with water quality standards listed by the Federal Water Pollution Control Act of 1972. A short-term anticipated impact is to increase swine producer participation in NRCS's Environmental Quality Incentive Program. A long-term anticipated impact is to reduce or eliminate the need to boil water in villages dependent upon catchment systems for potable water.

C. Source of Federal Funds: Hatch

D. Scope of Impact: State specific

Goal 5: ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS

I. OVERVIEW

There are many economic and social challenges that face families in American Samoa. One that seems to underlay almost every issue is the confrontation of two very different cultures. As American Samoa becomes more and more westernized, families are forced to reconcile their traditional culture of respect for elders and communal living with the often oppositional values of western individualism. There is a need to help ease the transition for local youth and assist them in understanding and valuing their Samoan culture. Another great challenge for American Samoa is its changing demographics and growing population, which affects the availability of inhabitable land, and thus family values. With a 17% unemployment rate, an ever-increasing cost of living, almost 60% of the population with incomes below the U.S. poverty level, and more than 50% of average spending going to food and housing, the people need enhanced economic opportunity to maintain and increase their quality of life.

To address this goal during FY 2001, programs were offered in the following areas:

- Entrepreneurship and Home-based business
- Youth-at-Risk
- Samoan Culture and Arts/Crafts
- Clothing Construction
- Farm Safety
- *Elei* (block print) Fabric Art Printing
- Self-care for Mental Health Clients
- Youth Development

Samoan culture has also been included in all aspects of program development and delivery. To help ease the difficulties created by cultural clashes and social transition, the CES Families, 4-H and Nutrition staff have increased workshop offerings in Cultural Awareness. Pilot projects have included cultural arts and crafts, nature art, and *siapo* (tapa) making. To increase social stability, the Childcare Provider training program was updated and adapted to American Samoa. There was also an increase in enrollment in Children, Youth and Families at Risk (CYFAR) programs. Economic opportunities for homemakers, farmers and workers were increased through workshops on Entrepreneurship and Home-based business.

- 899 children and youth participated in youth-at-risk programs
- 333 parents participated in Family and Consumer Science programs
- 550 youth and parents participated in cultural awareness programs
- 100 children in the elementary and after-school programs participated in computer literacy programs
- 102 program participants plan to adopt one or more principles, behaviors or practices learned
- 56 participants actually adopted one or more principles, behaviors or practices within six months of completion of one or more of the above programs
- More than 400 school-age children participated in reading and enrichment programs
- 196 children attended farm safety presentations
- 27 ASCC field workers and CES staff attended farm safety training

- 188 participants actively attended non-certification pesticide presentations and reportedly increased awareness of pesticide safety
- 49 participants attended and completed the Pesticide Applicator Safety Certification Training Program

E. Financial and Human Resources:

4 FTE

Hatch Federal

Hatch Local

Smith Lever Federal \$51,560

Smith Lever Local \$12,717

Multistate Research Funds Federal

Multistate Research Funds Local

II. KEY THEME: HOME-BASED BUSINESS EDUCATION

A. Activity:

The ASCC Cooperative Extension Service (CES) has collaborated with the ASCC Small Business Development Center (SBDC) and the Women’s Business Center to form the American Samoa Small Business Development Network. Through the network, five CES staff members were certified to instruct all the courses offered through the NxLevel entrepreneurship series. They include *Business Start-Ups*, *Micro-entrepreneurship: Business Plan Basics*, *Entrepreneurs*, *Agriculture Entrepreneurs*, and *Youth Enterprise Academy*. In this reporting period, CES agents co-taught with SBDC counselors three courses of Micro- and Business Start-ups. Participants who completed the courses during the reporting period included the territory’s only commercial ‘ava farmer, a manufacturer of traditional block print (*elei*) fabrics, and several florists using exclusively locally grown flowers. CES agents also presented their business programs to taxi drivers, bus drivers and local artisans at the Office of Tourism’s annual “Moso’oi Festival,” a week-long tourism promotion effort. CES agents also conducted a workshop for over 75 participants promoting the Western SARE Farmer/Rancher Grant. Applicants for the FY 2002 grant still awaiting a decision on their application include several pig farmers, and a local farmer hoping to increase her vegetable productivity and better market her homemade coconut jam.

B. Impact:

During this reporting period, over 40 participants completed the NxLevel courses. Business start-ups included a pool hall, a sewing shop, and an expansion of a grocery store, a mini-mart, and a travel agency. Other participants improved their business techniques for their present businesses. Several participants have obtained commercial loans from the ANZ Amerika Samoa Bank after submitting business plans completed in the courses. The ‘ava farmer has submitted an application for a second SARE grant, and has also been short-listed to receive a micro-loan from the Hawaii Community Loan Fund. The network partners have collaborated with the Community Loan Fund and the Bank of Hawaii to implement a local micro-fund program. As a result of the presentations of the CES and SBDC instructors and their clients, the Bank of Hawaii has approved funding for this project, and the local program will begin in 2002. The NxLevel courses and instructors have received high praises from participants, and have

been endorsed by both the Bank of Hawaii and the ANZ Amerika Samoa Bank. As a result of the impact seen during the first year, the American Samoa Power Authority is now encouraging its marketing and customer service employees to enroll in the course.

C. Source of Funding: Smith-Lever

D. Scope of Impact: State-specific

II. KEY THEME: CHILDREN, YOUTH AND FAMILIES AT RISK

A. Activity:

The CES Families, 4-H and Nutrition staff promoted a 4-H Cross-cultural Awareness Project. Its purpose was to promote Samoan traditional costumes, arts, crafts, language, music, culture, sports and agricultural practices. The importance of cultural identity and an appreciation of the unique nature of Samoan culture were emphasized throughout the workshops. Workshop topics included Samoan music, dance, oratory, legends and myths, *siapo*-making (tapa cloth), *elei* printing (block-print fabric), carving, and respectful language and behavior.

The Families, 4-H and Nutrition staff also promoted their “Reading Readiness” project. The purpose of this project was to instill in young children a love for and interest in reading. The project staff designed activities to build self-confidence and equip children with behavioral skills needed for the successful completion of this activity. In addition, on-going tutorial sessions were available to children who were school dropouts or falling behind in the project.

Staff members involved in the Children, Youth and Families at Risk (CYFAR) project, together with project site contacts and CYFAR volunteers, served as facilitators and mentors for training children in the elementary schools and after school programs emphasizing computer literacy, with the goal of developing their computer skills and helping them recognize the importance of computer literacy in their future.

Currently, Children and Youth At Risk program materials are being developed, translated and adapted for the territory. Pilot testing has already begun with some materials, in order to identify what changes must be made so they can be adopted and used with all youth development programs. Program materials include projects on science and math applications, clothing/sewing information, and Samoan cultural materials.

B. Impact:

More than 550 youth were involved in 60 cultural workshops and activities. 85% of the participants reported that their attitudes towards the Samoan culture have changed, and they have developed a sense of pride in their identity as Samoans and appreciate their cultural uniqueness and diversity. CES has successfully collaborated with the Department of Education, the ASCC Department of Samoan and Pacific Studies, the Amerika Samoa Humanities Council, and local village councils on these workshops.

More than 400 school-age children participated in more than 35 in-school and after-school reading and enrichment programs using the “big book” approach, CD-ROM reading packages (e.g., Hooked on Phonics Kit) and Samoan reading materials. Parents also used the books brought home by children from the workshops to read to their children, enhancing family togetherness. Reading programs were conducted in both Samoan and English.

CYFAR staff, project site contacts, and volunteers served as facilitators and mentors to more than 100 children in the elementary schools and after-school programs in computer literacy. This project allowed participants access to the Internet so they could communicate with friends and families abroad. Participants also held on-line conversations with pen pals, which helped develop children's spelling and vocabulary skills. At one project site, a contact facilitator discussed the usefulness of the computer in writing research and term papers, as well as the ease of finding information, saying, "Even the latest news of the world is now at the touch of the children's fingertips. Gone are the days when current events were being discussed 2 weeks behind in a magazine or newspaper. Now everything is updated and the knowledge of technology is right at their fingertips!" Some parents have reported buying computers because, "the kids are always late getting home, waiting for their turn to use the computers at school for their school projects. Now they [the parents] don't have to call them in for dinner, the children are right there surfing the net for everything they want to know."

C. Source of Funding: Smith-Lever

D. Scope of Impact: State-specific

II. KEY THEME: FARM SAFETY

A. Activity:

Farming in American Samoa still remains largely untouched by mechanization. Dramatic population increases over the last few decades have increased pressure on farming production as agricultural land becomes less and less available to farmers. ASCC CES has been charged with establishing farm safety and health programs with the intent of encouraging farmers to adopt safe farming practices in order to reduce the incidence of disabilities incurred by agricultural workers resulting from disease or injury. Phase One of the project was to train the CES staff, research assistants and ASCC groundskeepers working on-site and at demonstration sites. Phase Two was to organize and conduct group workshops in the villages and at special college events to attract more participants. Three different workshops were conducted in the islands of Manu'a and Tutuila. One workshop entitled, "Treating Animal Bites on the Farm," was held at the Agriculture Experiment Station in cooperation with Emergency Medical Service (EMS) personnel. This workshop was held during the first American Samoa "Pig Week" festivities.

B. Impact:

FY 2001 saw the first ever farm safety awareness program for ASCC field workers and local producers. Though many people still overestimate the adequacy of their own safety precautions, CES continues to promote the idea that "an ounce of prevention is worth a pound of cure." CES piloted its comprehensive training with ASCC field workers before extending it to the farming community. Ten Forestry field crew members, 6 Agriculture Extension agents and staff, 3 Experiment Station maintenance personnel, 3 Experiment Station research assistants and 5 ASCC groundskeepers attended the first training. Since then, staff members have been wearing proper protective clothing and practicing safe habits. There have been no documented reports of fatalities or major injuries on campus. Though a few minor injuries have occurred, they could be treated at home. The Lyndon B. Johnson Medical Center documented only two poisoning cases during this reporting period, neither of which was farm-related.

Because children play an important role in family farm tasks, CES programming also focused on children's safety as a priority. About 145 children attended farm safety presentations held at two environmental summer camps and at a church group. The adult sessions were conducted at various locations with a total number of 51 participants attending.

C. Source of Funding: Smith-Lever and 3-D funds (Farm Safety)

D. Scope of Impact: State-specific

II. KEY THEME: PESTICIDE SAFETY

A. Activity:

The CES Agriculture Extension division, in conjunction with the American Samoa Environmental Protection Agency (ASEPA), continued to address pesticide safety in the territory using several different approaches. Three Pesticide Applicator Safety Certification Trainings were administered for this reporting period, with each lasting 20 hours. Non-certificate awareness programs were also presented at fairs, schools and workshops for government agencies, non-profit organizations and farmers. Six presentations were delivered at two "Le Tausagi" Annual Environmental Camps, isolated farmers in the Manu'a islands, church groups and government agencies. These programs were aimed at education different segments of the population with the hope of providing a better understanding and to make better choices about pesticide use and safety.

B. Impact:

EPA enforcement has been very effective in tracking down illegal pesticide applicators in the territory, resulting in the citing of 10 non-certified applicators, and stopping three separate incidences of illegal importation of non-EPA registered pesticides into the territory. The island-wide pesticide monitoring has revealed that other government agencies and private companies were applying pesticides illegally around warehouses and offices. Of the 49 participants attending and completing the Pesticide Applicator Safety Certification Training, there were 3 Commercial Structural Pest Control Company owners/operators, 3 Commercial Structural Pest Control applicators, 2 Public Health groundskeepers, 3 Ace Hardware sales agents, and 2 Starkist Samoa safety supervisors. The remainders were private farmers. All of the participants successfully completed the course and passed the certification exam. One certified applicator even sent a thank-you letter to the ASCC-Community and Natural Resources director expressing his appreciation for the information and skills he learned from PAT. According to a focus group discussion, 51% of the participants that attended these trainings have incorporated at least two environmentally friendly pest control methods, especially mulching and intercropping. Hundred eighty-eight (188) participants actively attended non-certification pesticide presentations and reportedly increased awareness. ASCC CES and ASEPA also worked together to coordinate a special pesticide awareness training for 26 Quarantine, Customs and Public Safety/Fire Department employees, during which participants unanimously indicated during group conversations that this was their first opportunity to learn and understand the skills needed to deal with pesticide safety, leaks at port of entry, and especially the smuggling of illegal pesticides.

C. Source of Funding: Smith-Lever and 3-D (PAT)

D. Scope of Impact: State-specific

III. STAKEHOLDER INPUT PROCESS

The low turnout of clients during public meetings last year encouraged us to modify our approach in obtaining stakeholder inputs. Rather than waiting for the clients to come to public meetings, our staff went out into the community and collected stakeholder inputs through surveys. The extension staff took the lead in this process due to their direct daily contact with our clients. The extension and research staff work closely together, and the research staff are kept in the loop concerning client needs. The surveys were given during farm visits, village presentations, program council meetings, and when clients visit or call our office. While all persons living in American Samoa had the opportunity to participate in this process, the vast majority of the participants were students, farmers, homemakers, entrepreneurs, 4-H leaders and 4-H members. These clients participate in the extension programs and receive direct benefit from the research projects. They have a vested interest in the programs and have strong ideas on how the financial resources should be allocated.

According to the 2000 U.S. population census, the population of American Samoa is 88% Samoan and 3% other Polynesian groups, so the majority of the persons participating in the stakeholder input process are from the Pacific Islander ethnic group. The other ethnic groups, primarily Filipino, Korean, Chinese and Caucasian, to a large extent form the merchant, technical and professional classes. Few persons from this “other” group participate in the CNR programs.

Similar to last year, the Samoan/Polynesian program participants cross all socio-economic groups, especially the lower income levels, and include some persons with questionable immigration status. 58.3 % of the territory’s population fall under the U.S. poverty level, and 36.9% of the population are foreign born. It is not difficult, therefore, to serve those persons normally considered the “underserved,” and persons from this category participated in the input process.

All persons residing in American Samoa (including the main island of Tutuila and the Manu’a Island Group of Ofu, Olosega, and Ta’u) were given the opportunity to participate in the stakeholder input process. The majority of the persons participating in the process fell into what would be considered the “normal client base.”

The surveys/interviews were usually held in the Samoan language with available English translation. The interviews were conducted either on an individual basis or group sessions. The data and information collected from surveys were used in developing the text of this report’s respective goal areas.

A total of 1,472 persons participated in the process. All villages in the four major islands of Tutuila, Ofu, Olosega, and Ta’u were covered.

The following is a summary of the stakeholder inputs:

1. Families, 4-H & Nutrition (F4HN) Community Survey.
2. Seventy-two (72) F4HN clients and members of the community who completed the survey provided the following prioritized program areas for CNR to address:
 - Sewing
 - Money Management
 - Vegetable Gardening
 - Nutrition
 - Flower Gardening
 - Parenting Education
 - Food Preparation
 - Food Safety
 - How to Develop and Run a Small or Home Based Business

Other topics listed in the order of importance included:

- Tree planting
- Food & Farm Fair
- Swine production
- Traditional handicraft, *elei* (fabric printing using a *upeti* or carved board with traditional designs) *siapo* (tapa)
- Health Fair
- Small engines repair
- More community outreach programs

Agriculture Extension Service (AES) Survey

Forty-seven (47) clients who attended the Pesticide Applicators Training (PAT) and eighty-four (84) farmers who were interviewed during farm visitations and office visits recommended that CNR address the following prioritized needs and issues:

- Need more improved planting materials (taro – Filipino cultivar, banana – Goldfinger variety, vegetable seeds and seedlings)
- Need assistance in securing funds from lending institutions and grants to start and improve farming operation and entrepreneurship
- Availability of cheaper pesticides and fertilizers
- Need tractor services to cultivate land for vegetable, taro, and banana production
- Improved breeding swine stocks
- Pig waste management
- Free planting materials

Forestry Survey

1249 participants of forestry village meetings, school presentations, Arbor week activities, UCF & FSP Council meetings, visitations and individual sessions strongly recommended the following topics in the order of importance:

- Training on invasive species, pesticide safety, and different aspects of forestry
- Traditional medicinal and native hardwood species plot
- Agroforestry demonstration plots
- Tree pruning demonstrations
- Coastal Stabilization
- Vegetable Gardening
- *Autalavou* (youth) and *aumaga* (young untitled men) volunteers for village forestry projects
- Greenhouse construction
- Establishment of Seed Bank
- Christmas tree plot (Norfolk Island Pine)
- Extension agent position for Tau, Manu'a
- Flowering shrubs
- Ag. Pests (Insects and Diseases) - taro armyworm, rhinoceros beetle
- Ecotourism
- Adopt a beach project (environmental project)
- Manu'a Food & Farm Fair
- High school Ag. Curriculum (ag. & natural resources)
- Use of appropriate shrubs and trees for conservation buffer zones on Ta'u island
- Forest Legacy Project
- Develop posters of local trees
- Control of invasive species
- Trail Building
- Continuation of Arbor Week program
- Staff development opportunities - off island workshops
- Grafted fruit trees that bear fruit earlier
- Information on *Nonu* (noni) juice production and marketing
- *Ava* (kava) production
- Revival of non-timber forest products especially for medicinal purposes
- Indigenous tree species production
- Hedgerow species for soil erosion control
- National tree of Samoa

CNR division has programs in place addressing many of the aforementioned issues. Some of the expressed needs are outside our mission, cannot be addressed due to internal issues, or are issues where the cost exceeds the benefit. Supplying cheaper fertilizers and tractor services are outside our mission. We do work with farmers to explore other avenues to address these needs. The suggestion of off-island training for staff is an internal issue. The CNR staff is given the opportunity to participate in appropriate off-island training. This applies to staff in all units and levels with the exception of administrative assistants and the buildings and grounds crew. There has been demand for an extension agent stationed in Ta'u, an island in the Manu'a

group. This island is 80 miles from the main island of Tutuila and has a population of 380 people. Having a full-time extension agent in a remote location for so few people has posed problems. The research and extension staff do make periodic visits to the Manu'a Group of Islands. The Food and Farm Fairs for both Tutuila and Manu'a have not been held in over 10 years. These fairs were very time consuming and expensive. Alternative events like the "4-H Mini-fair" and "Pig Week", "Show and Sell" and "Arbor Week" took place last fiscal year. These smaller events are more focused and manageable.

Other programs, though popular, made little impact. Sewing is a prime example. Fabric is inexpensive and uniforms made from the same fabric are needed for school, church, and work. Few households have sewing machines. Since few households have a sewing machine, teaching individuals how to sew had little impact. The client has no opportunity to continuing using the skills developed after the program is completed. Sewing techniques for entrepreneurs will be addressed.

There are areas that we can and will address. The forestry unit in conjunction with the USFS is in the process of developing the application package for the Forest Legacy program. We will explore ways to address the small engine repair need.

ASCC Partnerships

Many of the ASCC Division of Community & Natural Resources staff members serve as members of councils and committees of external organizations. Inputs are generated through these interactions with collaborating agencies and organizations. The following government and non-government stakeholder organizations have regular opportunities to provide input:

- American Samoa Community College (ASCC) Board of Higher Education
- Community & Natural Resources (CNR) Advisory Council
- Urban and Community Forestry Advisory Council
- Forest Stewardship Advisory Council
- Conservation Education Council
- ASCC Small Business Development Center
- ASCC Department of Samoan & Pacific Studies
- Interagency Piggery Management Council
- American Samoa Soil & Water Conservation District
- Natural Resources Conservation Service (USDA-NRCS)
- U.S National Park Service
- American Samoa Historic Preservation Office
- American Samoa Environmental Protection Agency (ASEPA)
- Department of Commerce (DOC)
- Coastal Zone Management Program
- Fagatele Bay Marine Sanctuary
- Department of Agriculture (DOA)
- Public Health Department (PH)
- Department of Marine & Wildlife Resources (DMWR)
- Office of Samoan Affairs (OSA)

- Governor's Office
- Department Parks & Recreation
- Territorial Administration on Aging (TAOA)
- Department of Port Administration
- Department of Public Safety
- Office of Tourism
- Feleti Barstow Library
- Territorial Emergency Management Coordinating Office (TEMCO)
- Department of Public Works
- American Samoa Power Authority
- Office of Protection & Advocacy for Disabled
- Office of Public Information
- Samoa News
- Samoa Post
- Private Schools:
- SPA-South Pacific Academy
- Manumalo Baptist School
- Pacific Horizon School
- SDA-Seven Day Adventist-Iakina School.
- Saint Francis School
- South Pacific International Center
- Faasao High School
- Marist High School
- Bible School of American Samoa
- Fatu-o-Aiga Elementary
- Saint Theresa Elementary
- Kananafou Elementary
- National Council of Churches
- Church Parishes
- Church Youth groups
- Church Women's groups
- Village Councils
- Village young men's organization (*aumaga*)
- Village women's groups
- International Pacific Women's Organization
- Le Tausagi Environmental Group
- Boys Scouts of America
- LDS Boys Scouts
- 4H school & village clubs
- Women's Business Center
- American Samoa Small Business Development Network
- Diabetic Association
- Humane Society
- American Samoa Farmer's Cooperative

- American Samoa Vegetable Farmer's Federation
- Tongan Community
- Parent Teacher Associations
- American Samoa Nutrition Coalition
- American Samoa Coalition for Teen Pregnancy Prevention
- Star Kist Samoa
- Samoa Packing
- ACE Hardware – American Inc.
- Bank of Hawaii
- ANZ – Amerika Samoa Bank

IV. PROGRAM REVIEW PROCESS

No changes have been made in the programs review process. The guidelines as outlined in the 2000-2004 Plan of Work are being followed.

V. EVALUATION OF THE SUCCESSFUL MULTI AND JOINT ACTIVITIES

The multi-state and integrated research and extension requirements do not apply to the formula funds received by American Samoa. American Samoa, the only Land Grant Institution south of the equator, is somewhat isolated. The University of Hawaii is the closest Land Grant Institution and is approximately 2,500 miles away. However, ASCC does participate in joint projects with partners in the American Pacific through Agricultural Development in the American Pacific (ADAP) projects, CYFAR, multistate research projects, and research coordinating committees. The work supported by Hatch and Smith Lever funds included multidisciplinary and joint research and extension projects. The following questions are addressed focusing on multidisciplinary and joint research and extension.

Did the planned programs address the critical issues of strategic importance including those identified by the stakeholders? Where feasible, the stakeholder-input process is included in the programs and projects. Some of the issues that continue to be identified by the stakeholders include issues already addressed and those outside the scope of our mission.

Did the planned programs address the needs of the under-served and under-represented populations of the Territory? The population of American Samoa is 88% Samoan with 58% of the population living below the poverty level. A large majority of the population consists of second language English speakers. The programs and projects have been designed with these demographic facts in mind. The extension agents are bilingual (English and Samoan). Most extension programs are conducted in Samoan with a few in English with Samoan translation. Printed materials are Samoan/English, as is television programming. Researchers visiting clients make use of translators when necessary. All persons requesting programs, information, technical assistance from research and extension receive assistance.

Did the planned programs describe the expected outcomes and impacts? The programs did achieve the expected outcomes. The programs/projects were designed to meet the needs of the people of American Samoa and for the most part were on target. The staff did underestimate

the demand for the SARE grant writing workshop. Twenty persons would have been a good turnout. Instead, 93 people attended the Friday 4:00 PM meeting. With a population of 57,000 people the vast majority of whom are second language speakers, this turnout was a pleasant surprise.

Did the planned programs result in improved effectiveness and/or efficiency? There is increased communication between research and extension and among disciplines. This is resulting in more joint programs/projects and better utilization of expertise of the staff. The program managers are also revising program delivery for better utilization of staff time and more effective program delivery.