NORTHERN MARIANAS COLLEGE-CNMI

COOPERATIVE RESEARCH, EXTENSION AND EDUCATION SERVICE

NMC-CNMI CREES

FY 2000 ANNUAL REPORT OF ACCOMPLISHMENTS AND RESULTS FOR THE 5-YEAR PLAN OF WORK

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Table 1. CNMI CREES Research and Extension Programs and Projects FY 2000 through FY 2004

Please see attachment for Table 1. This table reflects all the NMC-CNMI CREES formula funded programs and projects undertaken in relation to the NMC-CNMI CREES 5-Year Plan of Work. Table 1 reveals the funding source for each program, their time horizons, and which programs are involved for each goal. The table also reveals exactly what goals each program and project has met in Fiscal year 2000.

Agriculture Research and Extension Overall Executive Summary

OVERVIEW

The Northern Marianas College-Cooperative Research, Extension and Education Service provides coordinated extension educational opportunities and research projects through its Agriculture Research and Extension programs. The Agriculture Research and Extension programs are dedicated to help farmers, agriculturists, families, individuals, and the CNMI communities improve their overall quality of life. The educational programs and research projects are focused on providing services to improve the agriculture, environment, health and the economic well being of farmers, agriculturist, individuals and families. These educational programs and research projects are the results of the growing needs of the CNMI community. In addition, they are in line with the missions of the Cooperative Research, Extension and Education Service and the Northern Marianas College.

The Agriculture Research and Extension programs that address the needs of farmers, agriculturists, individuals and families in the CNMI are the *Aquaculture and Fisheries Development Program, Crop Production Improvement Program, Plant Protection Program, Soil and Water Management Program and the NMC-CNMI CREES Communications Program.*

OUTPUT INDICATORS

In the past year, Agriculture Research and Extension agents have developed culturally appropriate educational material and research projects that are used to conduct research and provide adequate and up to date information. Research scientists and Extension Agents have been working hard on projects in order to provide the people of the CNMI with a highly competitive agriculture system and safe and secure food to eat. In addition, the program helps the people of the CNMI find means to a healthy lifestyle, protect their natural resources and enhance their economic opportunities and quality of life.

OUTCOMES

Through collaborations with the Department of Lands and Natural Resources, the Department of Environmental Quality, the Soil and Water Conservation offices, the Public School System and many other partner programs, the Agriculture Research and Extension program has reached numerous farmers, agriculturists, families, and individuals throughout the CNMI.

IMPACTS

The Cooperative Research, Extension and Education Program has impacted many clients over the past year. The six programs have provided farmers with researched information on animal production, vegetable and fruit production, insect and weed control, pesticide usage, farm safety, soil and water management and have provided numerous other forms of information.

EVALUATION

All Agriculture and Research Extension programs are in line with the NMC-CNMI CREES Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. For instance, the Rota Farmers Coalition was formed in order to help address and improve the agriculture conditions of the island of Rota. The Integrated Pest Management program is being strengthened by combining the forces of NMC, DLNR and the CNMI Quarantine division due to the increased number of foreign pests throughout the CNMI.

Family and Consumer Sciences Overall Executive Summary

OVERVIEW

The Northern Marianas College-Cooperative Research, Extension and Education Service provides coordinated extension educational opportunities through its Family and Consumer Science (FCS) programs. The FCS programs are dedicated to help families, individuals and youth improve their overall quality of life. The educational programs are focused on providing services to improve the health and the economic well being of families, individuals and youth. These preventative educational programs are the result of the growing needs of the CNMI community. In addition, they are in line with the missions of the Cooperative Research, Extension and Education Service and the Northern Marianas College.

The Family and Consumer Science educational programs that address the needs of families, individuals and youth in the CNMI are the *Food Safety and Quality program, Expanded Food and Nutrition Education Program (EFNEP), Nutrition, Diet and Health, Family Development and Resource Management. The Family Development and Resource Management program consists of the Parenting program and the Limited Resource Sewing Program, 4H Youth Development, Leadership and Volunteer Development and "Handle the Safe Way," a food safety research component.*

OUTPUT INDICATORS

In the past year, FCS extension agents have developed culturally related educational materials that are used as supplemental information to pre-existing curriculums. Many of these educational resources have been distributed to homemakers, school-aged children, and individuals with limited resources. Furthermore, due to the limited number of FCS extension agents last year, each staff member participated in various professional development training such as the 4H-sponsored Leadership and Volunteer Development training. Agents also conducted different workshops and training sessions in the areas of money management, parenting basics, food preservation and processing, food and kitchen safety, food quality, nutrition integration in the classroom, promoting the consumption of local produce and making healthy food choices.

During the summer, FCS programs in collaboration with the CREES Agriculture Research and Extension conducted a pilot project entitled *The Summer Youth Program* (SYP). The goal of SYP is to promote basic life skills to at-risk youth groups. Various FCS and Agriculture extension agents taught the clients the following subjects food safety, kitchen safety, the food guide pyramid, physical activity, horticulture, aquaculture, and basic sewing and crafts.

OUTCOMES

Through collaborations with various agencies in the CNMI, FCS has reached over 3000 families, individuals and youth throughout the CNMI. These agencies are the 4H program, the Nutrition Assistance Program (NAP), the Public School System, the Department of Public Health, the Department of Lands and Natural Resources, the Division of Youth Services, and the CNMI Food and Nutrition Council.

The Container Gardening campaign, a coordinated effort among CREES Agriculture Extension and Research and FCS programs, began in various elementary and high schools throughout the CNMI. Its success is due in part largely by the help of the CNMI Food and Nutrition Council, the Public School System and the Department of Lands and Natural Resources, as well as other private agencies, which donated much time and resources to the project. In addition, the 4H promoted environmental awareness via collaborating with public and private agencies to develop educational videos and calendars, and a mulching and composting project.

Due to a limited number of FCS extension agents, every program is required to share resources and clientele. As a result of the program redirection, participants of FCS programs developed more knowledge and skills to be productive members of the family and the community. In addition, with the integration of research and extension, FCS extension agents successfully collaborated with researchers to promote food security, food safety as well as to collaborate on the pilot project *The Summer Youth Program*. Due to the success of SYP, it was agreed by coordinators to make it an annual event. Youth who participated in SYP emerged with an

increased knowledge in basic nutrition, food safety, basic sewing and crafts, horticulture and aquaculture.

The increased public interest in food safety issues in the CNMI prompted the collaboration among FCS, the Bureau of Environmental Health (BEH), the Hotel Association of the Northern Mariana Islands, the Division of Environmental Quality, the Attorney General's Office, and the CNMI Food and Nutrition Council. The collaboration resulted in the establishment of the first ever Food Safety Education Week that was proclaimed by the Governor of the CNMI in September 1999. Thus, Food Safety Education Week was celebrated again in September 2000. Additionally, in the summer of fiscal year 1999, FCS sponsored and participated along with BEH staff in the ServSafe® Food Protection Manager Examination. Ninety percent (90%) of participants passed the exam and went on to conduct their own food handler's workshops where they incorporated the HACCP method into lessons. They have sharpened their expertise and are now educating food institutions, food service establishments, retail stores, and fish vendors to be more conscientious when handling, preparing, and storing food.

In the area of food and nutrition education, FCS agents conducted workshops to promote the integration of food and nutrition education into the current public school system's curriculums. As a result, participants (mostly public schoolteachers and administrators) learned ways to include nutrition education into their lesson plans. Due to the success of the workshop, the public school system would like to train more of its teachers on integrating food and nutrition education into current curriculums. Moreover, agents attended various classes at the local high school to teach students kitchen and food safety, ways to include local vegetables into their diets, and budgeting and money management.

Lastly, because of the active role FCS has in the community, health fair organizers continually depend and rely on its support. Thus, FCS was well represented at the annual First Lady's Vision Foundation – Healthy Families, Healthy Communities Symposium, the Early Childhood Conference, the Pacific Basin Association of Conservation Districts Conference, and various public school events.

IMPACTS

With the collaboration efforts between FCS and various internal and external partners, over 3000 families, individuals and youth were reached last year. In addition, stakeholders increased their clientele numbers because of our collaborative efforts. Evaluation results from stakeholders show that FCS programs are appropriate for their clientele and program needs. Memorandums of Understanding secure the relationship and the collaborative efforts between FCS and its stakeholders. Participants who completed FCS programs were taught to become nurturing individuals with the skills to be a productive member of the family and society. They have more knowledge in the areas of basic nutrition, food safety and quality, and family development and resource management. According to clientele evaluation results, there was an approximate 50% increase in knowledge and skills of clients in various FCS programs and another 50% increase in behavior change.

EVALUATION

All FCS activities are in line with the FCS Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. For instance, the pilot project *The Summer Youth Program* had to be included because of the lack of activities offered to youth during the summer holiday. Furthermore, various activities in the Plan of Work had to be placed in a different year because of the recent staff turnover.

GOAL 1: HIGHLY COMPETITIVE AGRICULTURE SYSTEM

EXECUTIVE SUMMARY

OVERVIEW

Importation of agricultural products (e.g. fruits, vegetables, fish, etc.) has been a major hindrance in the establishment of a strong agriculture industry in the CNMI. By improving our agricultural system we can minimize importation and at the same time, stimulate the island's economy. The lack of quality agricultural produce has also prevented the development of agriculture in the CNMI. By improving practices and the quality of produce from local farmers, we can decrease the number of imported products and improve the island's economy.

Since the establishment of CREES in 1987, it has been a priority for the program to enhance agriculture in the CNMI. With newly established programs aimed at conducting research and implementing extension outreach, advancement of agriculture has taken a step further in the past year. The CREES Programs that address Goal 1 are *Crop Improvement Program, Aquaculture and Fisheries Development Program, Plant Protection Program, Plant Nutrition and Soil Management Program and the Sustainable Agriculture Program.*

OUTPUT INDICATORS

The Crop Improvement Program began vegetable trials focused on 5 specific crops. The objective of these trials were to determine varieties that can be grown in the CNMI, which are currently being imported from other countries. Seeds were germinated on Saipan and were later distributed to neighboring islands for comparison in growth. In addition, the Aquaculture Development Program conducted several studies focused on feed and species alternatives. Post larvae were acquired from Guam and were raised in recirculating Aquaculture tanks. In collaboration with the Crop Improvement Program, similar crops that were being tested on farm plots were tested in hydroponics troughs. These crops may be used as a possible feed alternatives for fish and or shrimp as well as serve as water "polisher" in recirculating filtration systems. Furthermore, the Pineapple Research and Pilot Production Project acquired and distributed 10,000 crowns to 40 farmers on the islands of Rota and Tinian. The feasibility of commercializing pineapples in the CNMI will be determined.

Additional accomplishments include the Integrated Pest Management Program, which conducted numerous workshops involving over 30 individuals from private and public sectors on Saipan, Tinian and Rota. The program also established a system that certifies produce from local farms to have implemented proper pesticide management practices. In addition, the program has established a scouting program consisting of 30 farmers from the major islands.

The Plant Nutrition and Soil Management Program provided fertilizer recommendations based on soil samples taken from private farms. In other projects, the Sustainable Agriculture Program began promoting Chinaberry and/or Neem to be used as botanical pesticide. More than six farmers have begun planted Chinaberry or Neem on the islands of Saipan, Tinian and Rota. The Neem Extract Management of Anthracnose Disease of Vegetables and Fruits Project continues to research the use of Neem as an alternative to chemical pesticides.

OUTCOME

With the collaboration efforts of involved programs and external partners, an increase in vegetable production and farmer collaboration is noticeable. Several thousands of people were

reached through extension outreach, workshops, training sessions and publications. The Rota government built a fish hatchery on the island of Rota in response to the increasing demand for fingerlings by farmers, both commercial and non-commercial. The *Sabalu* Market was established, allowing farmers to showcase their produce in a street market setting.

IMPACT

Because of the trials conducted by several of the programs, alternatives and opportunities for farmers have increased in the past year. This in turn will enhance agriculture in the CNMI by increasing local production and providing better quality produce. In addition, private and public sectors will now be more aware of the impacts of pesticide and the importance of avoiding excessive use.

ASSESMENT

Currently, all of the programs involved in goal 1 are in line with the objectives of the NMC-CNMI CREES 5-Year Plan of Work. Additions to the Plan of Work may be needed to meet the changing needs of the community.

SUPPORT

Total expenditures equal $418, 196 including approximately six FTE's.

CROP PRODUCTION IMPROVEMENT PROGRAM

VEGETABLE IMPROVEMENT PROGRAM

OVERVIEW

The majority of fresh vegetables consumed in the CNMI are imported from the U.S. mainland. This transfers capital from these island communities to more developed stateside agricultural economy. If a larger fraction of these vegetables were produced locally, this capital would help develop the local agricultural economy to make it more competitive with that in distant farming areas.

Key Theme – Small Farm Viability

SITUATION

Vegetable farms in the CNMI are farmed in less than 5 Hectares (12 Acres) of land. These farms must compete with commercial farms in the U.S. Mainland that have over 100 Hectares (250 Acres) of land. Part of the local advantage lies in producing crops that either do not transport well in refrigerated containers, or that have lower taste qualities when harvested immature before shipping. To compete, local farmers must be aware of which vegetable varieties and practices perform well on the islands of Saipan, Tinian and Rota.

IMPACT

Vegetable variety trials were established on twelve farms over the three islands in two time periods: before and after the main rainy season of fiscal year 2000. The crops include Tomato, Bell Pepper, Eggplant, Lettuce and Cucumber. Initial identification of adapted varieties was made for the first four crops and is on going. The second crop is now growing (February 2001) and results will be publicized after harvest. Weed control has centered on reducing infestations of nutsedge (Cyperus spp.).

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matches.

SCOPE OF IMPACT:

Commonwealth-wide.

ANALYSIS OF COSTS AND RETURNS AND COMPARATIVE ADVANTAGE OF VEGETABLE PRODUCTION

OVERVIEW

Agricultural systems in the CNMI consist mainly of small farm (< 5ha) production of vegetable crops. Most systems are labor intensive and utilize unskilled low wage foreign guest workers. Farm operations are often managed by a guest worker and many farm owners/lease holders are absentee farmers in that they hold other jobs or operate other businesses and rely on the guest workers to run the farm. It is uncommon for farms to keep farm records of plantings, input usage, or harvests. Further, agricultural markets are constrained by a retail consignment system, limited local demand for vegetable crops, and import market competition. Exports of agricultural products to nearby Asian markets are restricted due to the presence of the melon fly. Given these circumstances, the profitability of farm operations is not well understood by researchers or the farmers themselves. The comparative profitability of locally grown crops is not well understood and it is possible that some commonly grown crops result in net losses to farm operations. The comparative advantage/disadvantage of locally grown crops with imported crops is also not understood.

Key Themes - Agricultural Profitability, Agricultural Competitiveness, Small Farm Viability

SITUATION

In the absence of farm record keeping it is necessary to collect farm level data on planting practices to provide a foundation from which to assess production, costs and returns and comparative advantages. It is also necessary to determine which crops are marketable and to assess the strengths or weaknesses of local markets for crops.

IMPACT

Farm level data on crop plantings, including intensity of planting and square footage, is gathered on a monthly basis and entered into the Marketing Information System (MIS). The MIS was originally created using Agricultural Development in the American Pacific (ADAP) program

funding and is now part of the Agricultural Economics Program. The system consists of a Microsoft Access database with visual basic programming and allows estimation of farm and crop level potential production, average planting practices, total agricultural production in the commonwealth by crop or farm as well as monthly production estimates based on known plantings. The plantings data in the system serves as a foundation for identifying plantings that are nearing harvest, which provides the survey frame for in-field cost and returns surveys for each crop. Cost and return surveys are slated to begin in FY 2001. In addition, separate crop yield surveys will be undertaken to improve the MIS. This project will determine relative profitability and import competitiveness of crops currently grown in the CNMI. This information can be used to assist farmers with planting decisions to enhance farm profitability and their ability to compete with imports. Clearly, improved profit margins will strengthen the local farming sector and improve the local economy.

SOURCE OF FUNDS:

Hatch, State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

PINEAPPLE RESEARCH AND PILOT PRODUCTION PROJECT

OVERVIEW

Two of the greatest constraints to agricultural development on the islands of Rota and Tinian are the lack of transportation and storage for a consistent market. There is an on-going need to find non-perishable crops to allow for prolonged harvest, simple storage and transportation. Pineapples are in local demand for home consumption and hotel markets. They can be harvested at varying degrees of ripeness to allow for shipping to off-island markets and hold up well in transport. This project is a research and extension project that will allow local farmers to be more competitive with imports. Techniques to reduce costs of production and other constraints will be identified and disseminated. By the end of this project, local producers will be set on a pathway to enlarge the local fresh pineapple market and take most of it away from imports by offering a better and lower cost product.

Key Theme: Development of a new pineapple production industry and a niche market

SITUATION

The islands of Rota and Tinian are remote from all central marketing points. Produce is expensive to import and to export. This allows for a small local market that can command high prices. The prime target market for most local pineapples is the tourist using the local hotels. The pineapple crowns to be used as propagules are of the dominant Hawaiian variety 'Smooth Cayenne' which were imported from Hawaii and distributed on Tinian and Rota. Plastic mulch and alternative synthetic weed barriers were distributed to selected participants for weed control evaluation. Roundup ™ was tried for the first time as a weed control agent in pineapple plantations on Tinian.

IMPACT

To date – Approximately 10,000 crowns of the Hawaiian Smooth Cayenne variety were distributed to more than 40 clients on Rota and Tinian. On Tinian, CREES staff sprayed 2-year old plantations with Ethephon ™ to force flowering early in FY 2000. Pineapple fruits in commercial quantities were harvested for the first time on Tinian in late FY 2000. Twelve plantations on Tinian with about 3000 plants total were forced to flower. Of those, three planters sold commercial quantities of fruit. On Rota, due to the length of time to first harvest, there have been no visible results other than the presence of growing pineapples on various farms on the island. It is evident that there are tremendous differences in the capacity of certain island soils to produce pineapples. The second distribution took advantage of preferred pineapple soils. Farmers in the first distribution that planted on poor soils have mostly abandoned efforts. Approximately half of the first material is still properly managed and should produce in late summer 2001.

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matches.

SCOPE OF IMPACT:

Commonwealth islands of Rota and Tinian

AQUACULTURE DEVELOPMENT PROGRAM

OVERVIEW

The Aquaculture Development Program was established for both environmental and economic aspects. With the introduction of Aquaculture in the CNMI, degradation of natural resources and the importation of fish will be reduced. Because of the lack of land area, the program has adapted technology to better utilize land area and at the same time promote a sustainable agriculture system.

Key Theme- Animal Production Efficiency

SITUATION

The Aquaculture Development Program began testing different indigenous plants as an alternative or a supplement in feeding fish. Observations were made to determine palatability and growth rate. In addition, as an aeration alternative, the program installed a windmill to determine its reliability and durability in the tropics.

IMPACT

Tilapia responded positively with Swamp Cabbage (Ipomoea aquatica) indicating that it is a possible feed alternative, or supplement, particularly for limited resource families and or individuals. The windmill that was installed does not have such a positive effect, particularly for its unreliability during calmer days. Modification of the windmill may be needed to suit conditions in the tropics.

Key Theme- Innovative Farming Techniques

SITUATION

A study was conducted on the survivability and viability of raising White Shrimp (Litopenaeus vannamei) in city water as an alternative for Tilapia farmers. The shrimp were raised in existing recirculating fish tanks to minimize costs and avoid environmental degradation. Several trials were completed and additional ones will also be conducted on neighboring islands to compare

results as water qualities differ on each island. Future goals would include the integration shrimp tanks with hydroponics troughs to maximize production and improve water quality.

IMPACT

White Shrimp was successfully produced in Saipan's city water. This will provide farmers with an opportunity to raise shrimp inland with minimal constraints. Upon completion of this study, a workshop will be held on all islands capable of producing White Shrimp in city water.

SOURCE OF FUNDS:

Hatch and Smith-Lever 3b&c, State-local matches.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme - Aquaculture

SITUATION

Numerous projects were established in compliance with the 5-Year Plan of Work. Training sessions were conducted with students from high schools and grade schools to promote Aquaculture in all grade levels. The Aquaculture Specialist made farm visitations on the three major islands for both potential and existing farmers. A low cost aquaponics system was developed using locally available materials to give limited resource families an opportunity to practice Aquaculture. The program began airing television segments focusing on recirculating systems and how it can help protect the environment. In addition, the program has begun studying the feasibility of producing marine shrimp in city water, as an alternative for inland farmers with minimal environmental degradation.

IMPACT

The end of the fiscal year 2000 the program reached more than 1,000 people. Numerous high school students have continued training through other programs such as the Vocational Education Program. Studies indicate that White Shrimp can grow in Saipan's city water. This will allow farmers to raise shrimp in conditions similar to farming tilapia.

SOURCE OF FUNDS:

Hatch and Smith-Lever 3b&c, State-local matches.

SCOPE OF IMPACT:

Commonwealth Wide.

PLANT PROTECTION PROGRAM

OVERVIEW

The Plant Protection Program at CNMI CREES is based on the multi-disciplinary philosophy of Integrated Pest Management (IPM.) The IPM program was started from the beginning of fiscal year 2000. Field implementation needs were measured by means of a farmer KAP (Knowledge, Attitudes, and Practices) survey, carried out by CREES staff on the islands of Saipan, Tinian, and Rota. About 100 farmers were surveyed, using a one-to-one formal personal survey. Results were tabulated, and used to set the program development and implementation priorities. A technician training program was designed, developed, and delivered, through a 2-week program of classroom and field activities and lectures. Over 30 farmers, college staff, and government agency personnel participated in the program; nineteen passed the exams and satisfied the requirements to become IPM crop scouts and advisors through the program. Subsequent to the training program, monthly working visits to each island staff provided additional training and in-field practice to develop the crop scouting system, which would be implemented in 2001. This scouting system, with specially developed field data recording forms, began its operation in late 2000; evaluation of field methods and improvements of the system will be on going. Results of each field scouting trip, done weekly, are shared with the client farmers, and logged into a farm data base for long-term crop pest impact evaluation and program impact assessment studies, to be done after the program has been established for at least two years.

The IPM program allows farmers who participate with the program to reduce their pesticide use by at least 50%, allowing them to accrue savings to production costs, allowing them to better compete with imported vegetables and fruits in the local economy. The Department of Agriculture's goal is to replace at least 10% of the current 95% of imported foods in the CNMI economy with locally produced fresh foods. The IPM program should help them reach this goal.

Key Theme: Adding value to New/Old agricultural products

SITUATION

The IPM program qualifies participant client farmers to sell their fresh produce with an endorsement of the program and the Northern Marianas College that their vegetables and fruit are produced using minimal amounts of pesticides. This endorsement can be used at their sales points, to inform the public and assure them that their pesticide management practices agree with those of the IPM program, adding value and quality to their produce. The farmers voluntarily submit their fresh produce to pesticide residue testing, which validates their food safety claim.

IMPACT

To date, about 10 farmers per island (30+ total) have signed up for the scouting and advising program. The IPM certifications are in progress, to be finalized during 2001.

SOURCE OF FUNDS:

Smith-Lever and USEPA, through CNMI DEQ. 3 FTE spent time on these activities during 2000. State-local CNMI matching funds through in-kind labors contributions.

SCOPE OF IMPACT:

Plans: pesticide residue testing available to the public at open farmers' market, and at farm gates, with IPM staff at the request of client farmers. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand. Results of these program activities will supplement the revision of IPM training manuals through the ADAP program.

Key Theme: Agricultural Profitability

SITUATION

The IPM program improves client farmer profitability by reducing expenditures and investments on pesticides and equipment and labor to the bare minimum required for successful crop protection. Alternative crop protection methods other than pesticides are highly recommended, as part of a multidisciplinary and multiple approach management system, rather than the old, disproved "spray everything" approach to crop protection.

IMPACT

Results of this activity are yet to be measured and evaluated.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on IPM activities.

SCOPE OF IMPACT:

This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand. Results of these program activities will supplement the revision of IPM training manuals through the ADAP program.

Key Theme: Diversified/Alternative Agriculture

SITUATION

The IPM program encourages farmers to grow many crops, to diversify their fields for better insect and disease management. Effective crop rotations and alternative crops interrupt pest populations, and yield different crops, giving more access to markets, which might not have been advantageous previously. The agriculture here is already of the type that is called "alternative" on the U.S. mainland, and this program helps it improve its productivity.

IMPACT

Continued support of the traditional agricultural patterns improves client farmers' chances of success. This program has not changed their management in this respect.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on IPM activities.

SCOPE OF IMPACT:

Yet to be measured. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand. Results of these program activities will supplement the revision of IPM training manuals through the ADAP program.

Key Theme: Invasive species

SITUATION

All the agricultural pests in the CNMI are invasive species, and include all the insects, diseases, and most of the weedy plants. This program advises and teaches technicians and farmers how to deal with them. This includes biological control agent augmentation and protection when possible.

IMPACT

Yet to be measured. Long-term data needed to demonstrate impact.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on these activities.

SCOPE OF IMPACT:

Yet to be measured.

NEEM EXTRACT MANAGEMENT PROJECT

OVERVIEW

Anthracnose disease of vegetables and fruits is a limiting factor in the commercial production of these crops in the CNMI. The use of synthetic commercial fungicides is not commercially, nor environmentally, sustainable on small Pacific islands with delicate ecosystems. Biological pest control and a sustainable, integrated management system must be utilized whenever possible to reduce the destructive effects of pesticide uses.

Key Themes – Organic Agriculture, Tropical Agriculture

SITUATION

Since the 1950's, the use of chemical pesticides has dramatically increased within the CNMI. The importation of these chemicals comes with a very high price to farmers and to our ecosystem. Relevant factors include the high cost of the chemicals, their sporadic availability, the amount of time required to receive the product from the US mainland, and the short shelf life of chemicals due to the high temperatures and humidity of the tropical climate. Most of the agriculture parks are located over the island aquifers, raising increased public concerns regarding the possibility of pesticide residues in the drinking supply. Pesticide runoff is extremely damaging to the surrounding coral reefs, aquatic life, and marine habitats causing the eventual destruction of the ecosystem encircling the islands. Organic crop production and sustainable integrated pest management are newly reintroduced concepts to the region and require specific projects to successfully demonstrate their use to local growers.

IMPACT

Previous work in this 3-year project focused on the use of ethanolic extracts; FY2000 (Year 2) was focused on the use of aqueous extracts. During the reporting period, five incremental levels of neem extracts were compared to non-extract treated petri plates of fungus isolates obtained from symptomatic, infected mango, papaya, and pepper plants. Protocols using two time sequences were used to test concentrations of extract. These trials were inconclusive and have been continued into FY2001, (Year 3), and the last year of the project. Contamination was a serious problem in the laboratory during this reporting period; we lost eight of our trials to bacterial contamination. Increased attention to sanitation was implemented and antibiotics added to the extracts. Protocols were revised, as it was also suspected that there was insufficient extraction of the neem compounds in the aqueous trials to provide for a meaningful study. The tissue culture component of the project was initiated in August with the training of key personnel for rapid propagation.

The potential benefits of this study include the economic advantage of using locally available materials, ease in preparation and application within an integrated system, and the environmentally friendly use of a natural plant extract with proven non-toxicity to humans, animals, wildlife, and fish. Neem plant materials traditionally have a high rate of grower acceptance in the more underdeveloped countries of the world. Currently the paucity of research and lack of sufficient quantities of commercial product limit the acceptance of neem in the U.S. The use of neem plant extracts has worldwide applications for those of us trying to provide alternatives to the synthetic, restricted pesticides currently damaging our land, our water, and selves. The documentation of the fungicidal activity, in addition to its proven insecticidal, nematicidal and enhanced nutrient uptake capability for major crop plants helps provide an insight to the project.

SOURCE OF FUNDS:

Hatch, State-local matching.

SCOPE OF IMPACT:

Worldwide, Pacific region, Commonwealth-Wide.

PLANT NUTRITION AND SOIL MANAGEMENT

OVERVIEW

This project is essentially the creation, adoption, and testing of a fertilizer recommendation system for the CNMI. Fruit and vegetable farmers have become increasingly dependent on synthetic fertilizers, but have not had access to a recommendation system based on soil and plant tissue sample analyses. Without a sample-based system for guiding fertilizer application, over- and under-application may occur and producers have no way of optimizing their fertilization practices. A recommendation system based on literature values was initiated in FY 1999.

Key theme: Soil Sampling

SITUATION

The purpose of this program would be to provide detailed recommendations to CNMI farmers on the most economical use of nitrogen and phosphorus fertilizers. The recommended dosages are based on the soil samples taken from the participants' farm. These samples are then sent to the University of Guam for a complete breakdown analysis of the soil. The development of the fertilizer sources and application technologies to make a farm-level impact on the more exotic problems such as calcium or iron deficiency is yet to be developed.

IMPACT

In FY 2000, a total of twenty fertilizer recommendations were provided to CNMI producers based on the soil samples taken from each producer's farm. An adequate database for assessing the status of Rota's agricultural soils was collected and evaluated in FY 2000. Preparations were in mid-stride at the end of FY 2000 to conduct plant tissue samplings to extend the power of our recommendation system. More than 30 samples were collected in the Kagman Agricultural Park, an area of intensive commercial vegetable production on Saipan. Full analyses of the 30 samples have not been received.

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matching.

SCOPE OF IMPACT:
Commonwealth-wide.

SUSTAINABLE AGRICULTURE

OVERVIEW

Sustainable Agriculture, (SA) combines research and extension programs designed to reduce the high cost of commercial inputs such as pesticides and fertilizers. Techniques are being developed that reduce, if not eliminate the need for commercial inputs with on-site, locally available inputs. With proper management, SA farming techniques will reduce production costs and make our farmers more competitive with imported produce.

Key Theme: Developing on-site inputs to replace commercial inputs

SITUATION

Fertilizers and pesticides are usually imported and are sold at commercial prices. This project allows farmers to make fertilizers and pesticides by growing them on their farm site. Extracts from Neem, Chinaberry, Curry Leaf and other locally grown trees are being used as pesticides. These extracts have hundreds of compounds working simultaneously that effect insect pest in many different ways. The main effect is a repellent for chewing and sucking insects. The extracts also affect insect's ability to swallow (the effect is immediate), juvenile hormone and others. Leuceana, a locally available legume tree is being used as an alley crop demonstration. The Leuceana is planted as a hedgerow in rows fifteen feet apart. Crops are planted between the hedgerows. The hedgerows are trimmed periodically with the clippings placed on the ground near the crops. The clippings (green manure) decompose providing nutrients and organic matter to the soil, which is then available to the plant.

IMPACT

Six farmers have planted Chinaberry and/or Neem trees on their property in Saipan, Rota and Tinian. Three farmers are using extracts from these trees as pesticides and have reported

excellent repellent properties when used periodically. Approximately ten other farmers are interested in planting Neem and Chinaberry to be used as botanical pesticides. One farmer has attempted to plant Leuceana along the contours of his land in order to provide green manure and to establish green terraces.

SOURCE OF FUNDS:
None for this reporting period

SCOPE OF IMPACT:
Commonwealth Wide.

GOAL 2: A SAFE AND SECURE FOOD AND FIBER SYSTEM

EXECUTIVE SUMMARY

For 13 years, the Cooperative Research, Extension and Education Service (CREES) through its Family and Consumer Science and the Agriculture Research and Extension programs has helped CNMI consumers become more informed about food safety and quality issues. The educational programs deliver research-based information and education in the classroom, community group settings, and food and retail establishments to help participants prepare, handle, and store food safely. In addition, extension agents and researchers have worked together to promote container gardening to students and families in schools and homes. As a result, consumers have access to a wholesome and secure food and fiber supply.

The Family and Consumer Science and Agriculture Research and Extension programs that address Goal 2 are: *the Plant Protection Program, the Aquaculture and Fisheries Development Program, Food Safety and Quality Program, the Expanded Food and Nutrition Education Program, and the Nutrition, Diet and Health program.*

OUTPUT

In the past year, FCS, and Agriculture extension agents, with its collaborators, have developed and marketed culturally appropriate food safety education material. Many of these educational resources have been distributed to homemakers, school-aged children, consumers, and food and retail establishment employees. Furthermore, due to the limited number of extension agents last year, each staff member participated in various professional development training such as the ServSafe® Food Protection Manager Examination and the Pesticide Applicator's Training. They also conducted different workshops and training sessions in the areas of container gardening, pesticide application, and food safety education through formal and non-formal education. Additionally, the CREES official web site was created to serve as another form of outreach to the community where educational materials are available.

During the summer of fiscal year 2000, FCS programs in collaboration with the CREES Agriculture Research and Extension conducted a pilot project entitled *The Summer Youth Program* (SYP). The goal of SYP is to promote basic life skills to at-risk youth groups. Various FCS and Agriculture extension agents taught the clients the following subjects food safety, kitchen safety, the food guide pyramid, physical activity, horticulture, aquaculture, and basic sewing and crafts.

OUTCOME

Through collaborations with the Division of Environmental Quality, the Nutrition Assistance Program (NAP), the Public School System, the Department of Public Health, and the Department of Lands and Natural Resources, FCS and Agriculture Research and Extension has reached over 3000 families, individuals and youth throughout the CNMI. Additionally, 2,000 consumers were reached during September's Food Safety Education Week coordinated by the Bureau of Environmental Health, the Attorney General's Office, the Division of Environmental Quality, the Hotel Association of the Northern Mariana Islands, and the Northern Marianas College Cooperative Research, Extension and Education Service.

FCS and Agriculture extension agents and researchers conducted workshops in the areas of container gardening of high nutrient-density crops, food safety and quality education of fresh food, food label reading, HACCP method, pesticide applicator's training and certification, and food resource management. As a result, participants (consisting of public agency employees, farmers, teachers, homemakers, and food and retail establishment personnel) learned about the

effects of chemicals used in farming and its alternatives, container gardening of high nutrient-density produce, proper food label reading, and food safety education. Moreover, agents attended various classes at the local high school to teach students kitchen and food safety, ways to include local vegetables into their diets, and budgeting and money management.

Due to a limited number of extension agents within programs, every program is required to share resources and clientele. As a result of the program redirection, CREES program participants increased their knowledge and skills in order to provide and consume safe food. In addition, with the integration of research and extension, FCS extension agents successfully collaborated with researchers to develop the pilot project *The Summer Youth Program (SYP)*. Due to the success of SYP, it was agreed by coordinators to make it an annual event. Youth who participated in SYP emerged with an increased knowledge in basic nutrition, food safety, basic sewing and crafts, horticulture and aquaculture.

IMPACT

With the collaboration efforts between FCS and Agriculture Research and Extension and various internal and external partners, over 3000 families, individuals and youth were reached last year. In addition, stakeholders increased their clientele numbers because of our collaborative efforts. Evaluation results from stakeholders show that CREES programs are appropriate for their clientele and program needs. Memorandums of Understanding secure the relationship and the collaborative efforts between CREES and its stakeholders. Participants who completed CREES programs were taught skills to provide a safe and secure food and fiber system. They have more knowledge in the areas of food safety and quality, pesticide application, and container gardening of high nutrient-density crops. Ninety percent (90%) of participants who took the ServSafe® Food Protection Manager's passed and are now able to train staff within their agency. Furthermore, through IPM, PAT, and SA farming practices, the need for chemicals that may leave a residue on locally produced crops are reduced. In time, all three farming techniques can be springboards for a local organic food market where consumers can purchase safe produce grown without the use of chemicals. Also, over 100 people took part in the Pesticide Applicator's Training and 68 passed the exams. Of the 68 participants, 29 passed an additional category qualifying them for full licensing to handle restricted use pesticides.

Through collaborations with the 4-H program, the Nutrition Assistance Program (NAP), the Public School System, and the Department of Public Health, EFNEP and the Nutrition, Diet and Health program has reached over 1500 families throughout the CNMI in the last year. In addition, there was about 70 youth and families with young children throughout the CNMI

enrolled in EFNEP. According to the EFNEP evaluation report, more than 75% of the graduates showed improvement in one or more food resource management practices such as planning meals, comparing prices, using grocery lists, and not running out of food or cutting children's meals because there was not enough money to prepare them. Meanwhile, 86% of the graduates demonstrated acceptable food safety practices such as thawing or storing food properly. Also, over 85% of youth from the pilot project *The Summer Youth Program* (SYP), demonstrated the ability to wash hands properly, to avoid cross-contamination, and to use temperature control when handling food.

ASSESSMENT

All Family and Consumer Science and Agriculture Research and Extension activities are in line with the CREES Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. Furthermore, various activities in the Plan of Work had to be placed in a different year because of high staff turnover.

SUPPORT

Total expenditures equal $487, 895 including approximately seven FTE's.

NUTRITION DIET AND HEALTH PROGRAM

OVERVIEW

This project is a extension project that will shape local people to be more aware of the importance of having food available all the time, consume healthy food, and choose foods with high fiber content that will help enhance their health.

Key Themes: Food Security, Food Accessibility and Affordability

SITUATION

The Nutrition Diet and Health program reached 169 adults and 900 young students from the local college, high schools and elementary schools. Through the container gardening program, the usage of local high-nutrient density crops has been promoted to students at Marianas High School, various church groups and all other interested individuals. The program also promotes the changing of eating habits and making healthy food choices to the families of college students and homemakers. For the past three semesters a consistent enrollment of 30 plus students have enrolled in the FCS Nutrition 101 course. We collaborated with the public school system in promoting good eating habits and exercise. Our program helped in providing nutrition education to parents and teachers by disseminating useful information on how to make nutrition polices for the schools and providing nutrition education to help the food vendors provide healthy food for the daily lunch program. The NMC FCS nutritionist helped PSS in certifying the menu for the hot lunch program. We also provided food demonstration on healthy food during the World Food Day to over 500 plus students.

IMPACT

With regard to the nutrition promotion program, all clients involved have demonstrated knowledge in healthy food choices. In addition, seventy five percent (75%) of students who participated in the nutrition promotion changed their eating habits and started participating in an exercise class.

SOURCE OF FUNDS:

Smith-lever, State-local matching.

SCOPE OF IMPACT:

Commonwealth-wide.

FOOD SAFETY AND QUALITY PROGRAM

OVERVIEW

This program is a FCS Extension program developed and designed to promote safe and quality food in the CNMI and to provide food safety education to food institutions, food handlers, youths and individuals that handle food. The program provides staff development to FCS employees and the Public Health Personnel in the area of Food Safety (Serve-Safe) and Quality Measures that help enhance and protect the health of people. One of our objectives is to educate the importance observing food safety and quality on imported fresh food, educate people on the variety of pesticide residue and how to properly read labels. We work closely with the CNMI Food and Nutrition Council and try to get every food item imported to or produced in the CNMI to be labeled.

Key Themes: Food Safety, Food Quality, Food Resource Management

SITUATION

The Food Safety and Quality Program focused its first implementation on training of staff, from FCS, Public Health Personal, Food Institution, Food Service Personnel, Public School System and individuals who were available for the program. FCS sponsored a Food Safety Workshop on "Serve-Safe," to train the employees from various agencies mentioned above. Eleven staff members from Public Health and PSS along with the 10 FCS staff members participated in the "Serve-Safe" workshop. Five other workshops were also conducted on the three main islands, out of which Forty-one (41) adults participated. In addition, The program was extended to all CNMI schools. A total of 234 High School students participated in the classroom presentations while, one thousand (1000) students were reached during the Food Safety awareness month from the elementary schools and other areas in the community. The educational approach focused on the proper food handling methods, HACCP, issues of food borne illness, Food borne pathogen

protection, Food Resource Management, hand washing, cross contamination, and personal hygiene.

IMPACT

A formal test was provided in all training to measure of the knowledge and skills learned. Ninety percent of the FCS and Public Health staff passed the test. A specialist from Washington State University provided training here in the CNMI which established a stronger collaboration between Public Health and the NMC FCS programs. The training was used to educate different food institutions, fish vendors and the general public on the aspect of food quality and food safety. A survey taken after the workshop revealed that seventy percent of the food institutions and individuals that attend the program have doubled their knowledge on Food safety and Food quality. The survey also mentioned that fifty percent of employees from food establishments changed their behavior while handling food and increased their skills in some of the many Food Safety aspects. Sixty percent increased their awareness on the relationship between time and temperature, hundred percent of them learned more about the danger zone. All of the school children that participated in the food safety class increased their knowledge on hand washing. One hundred percent of college students enrolled in the NMC Nutrition 101 Course increased their knowledge in nutrition, seventy five percent actually changed their behavior and fifty percent increased their skills on the aspect of food safety.

SOURCE OF FUNDS:

Smith lever, State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

PLANT PROTECTION PROGRAM

Key Theme: Food Quality

OVERVIEW

Many consumers worry about chemical residues on locally produced fruits and vegetables. Through IPM, PAT and SA farming practices significantly reduce, if not eliminate the need for such chemicals. In time, all of these elements of farming can be the springboards for a local organic food market where consumers can purchase safe produce grown without the use of any chemicals.

SITUATION

Food produced using only low amounts of pesticides will be of higher quality, by virtue of having little or no pesticide residues.

IMPACT

Results of this activity are yet to be measured and evaluated.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching.

SCOPE OF IMPACT:

Plans: Provide pesticide residue testing with the guidance of IPM staff at the request of client farmers on all three islands of CNMI are to become available to the public at open farmers' market and/or at farm gates. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand.

PESTICIDE APPLICATOR'S TRAINING (PAT)

OVERVIEW

The Pesticide Applicator's Training (PAT) project was suspended in 1997, due to insufficient staff interest and professional commitment. At the beginning of year 2000, all Pesticide Applicator's Licenses in the CNMI had expired, and there was great demand for re-establishment of the training programs. Management and staff committed resources and man-power to a complete redesign and organization of the PAT training programs and licensing through CNMI's Division of Environmental Quality (DEQ). Beginning in June, four PAT programs were offered, starting with Category 5, Commercial pest control for structural, institutional, and public health pest control. A PAT trainer from the University of Guam was hired to deliver this program, while NMC staff learned the methods and contributed lectures and supporting information as needed. Three PAT programs for private pest control certification, mostly targeted at farmers and extension workers, were conducted over the following three months. One program was delivered on each island: Rota in July, Tinian in August, and Saipan in September. In total, over 100 people participated in these 3-day training workshops. Of those who sat for the exams, 68 passed the basic exams, certifying their understanding of pesticide safety, handling, and regulations. These applicants received a certificate of successful course completion. Of these 68, twenty-nine also passed the additional category technical and math exams, qualifying them for full licensing to handle restricted use pesticides under the DEQ-administered USEPA pesticide laws. These 29 people are now the only ones who can legally purchase and use the highly toxic chemicals, which are labeled only for restricted use.

Key Theme: Food Safety

SITUATION

The safety and quality of our food supply is improved when farmers and commercial pest-control operators handle and use pesticides properly, and with appropriate skills. These training programs were designed to educate the public and pesticide users in the safety, handling, and regulations of pesticide use. They also educated the participants in how to recognize their management problems and make well-reasoned pest control decisions. When put into practice,

these correct decisions, to use the correct pesticides for a given situation, and then only when needed, will produce a safer food supply and protect worker safety.

IMPACT

The 29 people who are now qualified to apply for and be licensed to handle the very dangerous RUP pesticides are the lowest number in recent history, except when all were expired. The requirements for passing the exams are much more stringent, requiring that those who desire to be licensed actually prove that they know their complete management system, including regulations, pesticide safety, handling, pest biology and recognition, and environmental (non-target) protection. These PAT-training programs were modeled after the national standards.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching. 1 FTE for about 6 months.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM (EFNEP)

Key Theme – Food Resource Management

SITUATION

Through collaborations with the 4H program, the Nutrition Assistance Program (NAP), the Public School System, the Division of Youth Services and the Department of Public Health, EFNEP Program Aides continue to recruit limited resource-families and individuals with young children. Program Aides used the EFNEP curriculum, Eating Right is Basic (ERIB), developed by Michigan State University, to teach clients about making most out of their food dollars, and meal planning. Towards the end of the year, EFNEP staff and volunteers were trained by the University of Hawaii EFNEP State Coordinator to better deliver program services as well as ways to increase clientele. Moreover, she trained them to use the Food and Money Basics curriculum developed by the University of Hawaii, which is more culturally appropriate than the ERIB curriculum.

IMPACT

Due to the collaboration among various agencies and EFNEP, over 1500 families, individuals with young children, and youth were reached throughout the CNMI last year. In addition, there was about 70 youth and families with young children throughout the CNMI enrolled in EFNEP. According to the EFNEP evaluation reports, more than 75% of the graduates showed improvement in one or more food resource management practices such as planning meals, comparing prices, using grocery lists, and not running out of food or cutting children's meals because there was not enough money to prepare them.

SOURCE OF FUNDS:

Smith-Lever 3(d), State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme – Food Safety

SITUATION

During fiscal year 1999-00, EFNEP staff participated in the ServSafe® Food Protection Manager Examination and 90% passed. As a result, EFNEP staffs have more knowledge of food safety and the HACCP method. EFNEP staff, also, helped to establish the Food Safety Education Week in September 1999 and 2000. EFNEP enrolled about 70 youth and families with young children last year. They were taught how to keep food safe using University of Michigan's Eating Right is Basic. Towards the end of the year, however, EFNEP staff switched to the Food and Money Basics curriculum, from the University of Hawaii EFNEP, which was more culturally relevant. Moreover, EFNEP collaborated with other FCS programs and CREES Agriculture Extension and Research to develop the pilot project The Summer Youth Program (SYP). Food safety was an activity incorporated into SYP. Materials used included UH-EFNEP Food and Money Basics curriculum as well as Glo- Germ™.

IMPACT

Through collaborations with the 4-H program, the Nutrition Assistance Program (NAP), the Public School System, and the Department of Public Health, EFNEP has reached over 1500 families throughout the CNMI in the last year. In addition, there was about 70 youth and families with young children throughout the CNMI enrolled in EFNEP. According to the

EFNEP evaluation report, 86% of the graduates demonstrated acceptable food safety practices such as thawing or storing food properly. Also, the youth from the pilot project The Summer Youth Program (SYP) demonstrated the ability to wash hands properly, to avoid cross-contamination, and to use temperature control when handling food. Due to the success of SYP, it was agreed upon to become an annual summer event.

SOURCE OF FUNDS:
Smith-Lever 3(d), State-local matching

SCOPE OF IMPACT:
Commonwealth Wide.

GOAL 3: HEALTHY, WELL-NOURISHED POPULATION

EXECUTIVE SUMMARY:

For 13 years, the Cooperative Research, Extension and Education Service (CREES) through its Family and Consumer Science and the Agriculture Research and Extension programs has helped CNMI youth and families with young children improve their overall quality of life. The educational programs deliver research-based information and education in the home, classroom, and community group settings to help participants make informed lifestyle and health decisions. The results are strong, nurturing families, healthy children, positive youth development, and savings in food and healthcare costs.

The Family and Consumer Science and Agriculture Research and Extension programs that address the health needs of families, individuals and youth in the CNMI are the *Expanded Food and Nutrition Education Program (EFNEP), Nutrition, Diet and Health, the Aquaculture and Fisheries Development Program, Plant Protection and Crop Production programs.*

OUTPUT INDICATORS
In the past year, FCS and Agriculture extension agents have developed culturally appropriate educational materials that are used as supplemental information to pre-existing curriculums.

Many of these educational resources have been distributed to homemakers, school-aged children, and individuals. Furthermore, due to the limited number of extension agents last year, each staff member participated in various professional development training. They also conducted different workshops and training sessions in the areas of nutrition integration in the classroom, promoting the consumption of local produce and making healthy food choices. In addition, a nutrition newsletter is circulated to over 1500 food stamp recipients monthly. Additionally, the CREES official web site was created to serve as another form of outreach to the community. The Pineapple Research and Pilot production project focused on increasing the availability of pineapple, a fruit rich in Vitamin C and other nutrients. Prior to the research, pineapple was only imported and was usually poor in quality.

During the summer of fiscal year 2000, FCS programs in collaboration with the CREES Agriculture Research and Extension conducted a pilot project entitled *The Summer Youth Program* (SYP). The goal of SYP is to promote basic life skills to at-risk youth groups. Various FCS and Agriculture extension agents taught the clients food safety, kitchen safety, the food guide pyramid, physical activity, horticulture, aquaculture, and basic sewing and crafts.

OUTCOME

Through collaborations with the Division of Environmental Quality, the Nutrition Assistance Program (NAP), the Public School System, the Department of Public Health, and the Department of Lands and Natural Resources, FCS and Agriculture Research and Extension has reached over 3000 families, individuals and youth throughout the CNMI. Furthermore, the Expanded Food and Nutrition Education Program (EFNEP) enrolled 70 families and youth. According to EFNEP evaluation reports, at entry, none of the participants achieved acceptable scores in nutrition practices. However, in the end, 75% achieved acceptable scores.

Additionally, FCS extension agents conducted workshops to promote the integration of food and nutrition education into the current public school system's curriculums. As a result, participants (mostly public schoolteachers and administrators) learned ways to include nutrition education into their lesson plans. Due to the success of the workshop, the public school system would like to train more of its teachers on integrating food and nutrition education into current curriculums.

Moreover, agents attended various classes at the local high school to teach students kitchen and food safety, ways to include local vegetables into their diets, and budgeting and money management.

Due to a limited number of extension agents, every program is required to share resources and clientele. As a result of the program redirection, CREES program participants developed more knowledge and skills to be productive members of the family and the community. In addition, with the integration of research and extension, FCS extension agents successfully collaborated with researchers to develop the pilot project *The Summer Youth Program (SYP)*. Due to the success of SYP, it was agreed by coordinators to make it an annual event. Youth who participated in SYP emerged with an increased knowledge in basic nutrition, food safety, basic sewing and crafts, horticulture and aquaculture.

Lastly, because of the active role FCS has in the community, health fair organizers continually depend and rely on its support. Thus, FCS was well represented at the annual First Lady's Vision Foundation – Healthy Families, Healthy Communities Symposium, the Early Childhood Conference, the Pacific Basin Association of Conservation Districts Conference, and various public school events.

IMPACT

With the collaboration efforts between FCS and Agriculture Research and Extension and various internal and external partners, over 3000 families, individuals and youth were reached last year. In addition, stakeholders increased their clientele numbers because of our collaborative efforts. Evaluation results from stakeholders show that FCS programs are appropriate for their clientele and program needs. Memorandums of Understanding secure the relationship and the collaborative efforts between FCS and its stakeholders. Participants who completed FCS programs were taught to become nurturing individuals with the skills to be a productive member of the family and society. They have more knowledge in the areas of basic nutrition, food safety and quality, and family development and resource management. According to clientele evaluation results, there was an approximate 50% increase in knowledge and skills of clients in various FCS programs and another 50% increase in behavior change.

ASSESSMENT

All Family and Consumer Science and Agriculture Research and Extension activities are in line with the FCS Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. For instance, the pilot project *The Summer Youth Program* had to be included because of the lack of activities offered to youth during the summer holiday. Furthermore, various activities in the Plan of Work had to be placed in a different year because of staff turnover.

SUPPORT

Total expenditures equal $836, 392 including approximately twelve FTE's.

CROP PRODUCTION IMPROVEMENT PROGRAM

VEGETABLE IMPROVEMENT PROGRAM

OVERVIEW

The diet of the local people of the CNMI has changed radically in the post World War II era. This work intends to increase vegetable consumption by increasing production of two major classes of vegetables.

Key Theme – Human Nutrition

SITUATION

Since the year 1945, the fraction of calories consumed in the form of fresh vegetables has declined for local peoples of the CNMI. Vegetables such as tomatoes and bell peppers are mostly imported, and thus are both expensive and low in taste and nutrition since these are harvested in an immature stage. Most residents live in urban settings where topsoil was removed prior to construction of homes. This majority generally does not have a suitable place for home gardening in the soil.

IMPACT

The research and extension work mentioned in Goal 1 has made an impact in the Kagman Commercial Farm Plots, which is the most intensive vegetable production area on the highly populated island of Saipan. Vegetables grown under CSREES-sponsored on-farm research have been sold in Saipan since June 2000 in local storefront and street-sale markets. Our extension-research has taught farmers on Saipan, Rota and Tinian how to grow better seedlings (in full-sun nurseries) and how to conduct variety trials of state-of-the-art commercial hybrids (purchased direct from seed companies). This knowledge will shift the balance to more disease-resistant varieties that will produce high yields with less pesticide than older, unnamed varieties.

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matching.

SCOPE OF IMPACT:

Commonwealth-wide.

PINEAPPLE RESEARCH AND PILOT PRODUCTION PROJECT

OVERVIEW

The project goals are not just to compete with imports, but to expand the market by bringing the cost and availability of pineapple into reach for the majority of consumers in the CNMI, hence adding a new fresh-fruit product to people who previously did not consume significant quantities of pineapple. This goal will be achieved most readily by vigorously pursuing Goal one: bringing down costs and other barriers to local production of pineapple at a cost affordable to the average consumer.

SITUATION

Fresh fruits and vegetables are imported into the CNMI.

IMPACT

Producing pineapples on-island will add freshness and return money into the local economy. The distribution of planting material of improved varieties will yield better fruit and increase the local consumption, thus improving local diets. Approximately 1000 pineapples were sold to a retail store on Saipan, a Saipan hotel, and were sold house to house and in stores on Tinian and Rota. Prices received by growers ranged from $0.40 to $1.20, depending on fruit quality and buyer preference. Most marketed fruits ranged between 7 to 10 pounds.

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matching.

SCOPE OF IMPACT:

Commonwealth-wide.

NUTRITION DIET AND HEALTH PROGRAM

OVERVIEW

This program is addressing the risk factor of an unhealthy diet, bad eating habits, over weight that affect many people ranging from infants to the older adult population.

Key themes: Low birth weight, Human nutrition, poor pregnancy out come, human health

The Nutrition Diet and Health program is promoting the healthy eating habits and exercise because diet is a major risk factor involved in all the chronic diseases. Our workshops on the chronic diseases put an emphasis on the main risk factor of all chronic diseases in the CNMI, which is obesity. Poor eating habits are the number one contributors to the obesity problem that plagues the obese adult and children populations. Through the collaborations with Public Health and the Food and Nutrition Council we are combining forces to provide education to help end this epidemic. Three workshops on chronic diseases were conducted in order to provide education and information about obesity and other non-communicable diseases. The program also provides Nutritional Education on Pregnancy. We encourage mothers to practice good eating habits and how to choose healthy foods in order to maintain healthy pregnancy and a healthier baby. We provide information on the proper diets to be on during pregnancy and we also provide services to teen mothers who avail for the nutrition education program.

IMPACT

As a result of the workshops, fifty percent of diabetes patients now have regular visits to the local hospital for checkups. Eighty percent of pregnant women now make extra efforts to visit the women's clinic in the first trimester and other trimesters thereafter. One third of the participants (adult and children) are now involved in various exercise regimes.

SOURCE OF FUNDS:
Smith Lever, State-local matching

SCOPE OF IMPACT:
Commonwealth Wide.

Key themes: Food Safety, Food Quality, Food Resource Management

OVERVIEW

One of our main objectives is to reduce the incidence of food borne illnesses by improving safe food handling practices, improving process that safeguard the food supply and improve the understanding of food related risk. This program is developed to provide food safety education to the general public.

SITUATION

We educate people on the contents of the food label and how to read it. We encourage food venders to have labels on all ready-to-eat food items, including imported food items. Our program works closely with lawmakers in order to write and pass policies on any imported items to be labeled in English. This program provides education on preservation and food processing techniques in order to help people process their surpluses, to have more food available at home and even to help them establish a small business. Another education awareness campaign is to provide education on pesticide residues so that individuals will understand the harmful effects that may happen to them when they eat foods that are full of chemicals. Our program aims to promote health and wellness to the people of the CNMI. In addition, we wish to safeguard the food for the health and well being of the CNMI community. To promote these programs, there were five- food preservation and food processing workshops conducted for homemakers, farmers and all other interested individuals.

IMPACT

In effect, one hundred percent of the food vendors who sell ready to eat products, food items, are now required by law to have labels in English. Seventy percent of individuals who attended the workshops have changed their attitude on how to handle food products, and one hundred percent of the participants in food preservation and food processing workshops are practicing what they learned in the workshop at home. Some have sold finished products they preserved at home to the general public.

SOURCE OF FUNDS:

Smith- lever, State-local matching.

SCOPE OF IMPACT:

Commonwealth wide.

Food Safety (Handle the Safe Way) Program

OVERVIEW

Food Safety: Handle the Safe Way, is the research component of the Food Safety program. This program addresses Goals 2 and 3. Handle the Safe Way is an education program sponsored through Cooperative Research, Extension, and Education Service (CREES) designed to help educate the general public and businesses in the aspect of food safety such as proper storage of fresh, perishable food. The objective of the project is of mutual benefit, to share information on

food safety with the business vendor for consumer safety. CREES and the cooperators agree to work as partners in cooperative research. CREES is especially interested in specific vendor needs and vendors suggestions help enhance the project study. An identification number will be assigned to each vendor for the purpose of confidentiality during the project and at no time will the identities of a specific vendor be made public. All information and analysis results will be reported as averages of the total number of vendors cooperating in data collection.

PROJECT OBJECTIVES

a. Understand proper food handling and sanitation.
b. Understand the proper storage of perishable food
c. Learn about cross-contamination
d. Understand the relationship between time and temperature.

SITUATION

Two students were hired to help assist the FCS Associate Director to conduct research on the fish vendors selling fish along the roadsides of the CNMI. The "Handle the Safe Way" food safety, project is designed to test whether the fish sold along the roadside are safe to eat. In order for us to know if the fish are safe, testing of the temperature of the coolers is a very important component of the project. The cooler 's ideal temperature should be below 40 degrees Fahrenheit. The students went out to measure the temperature of the coolers of each roadside vendor and at some of the super markets that also sell fish.

The report revealed that all the fish vendors' coolers temperature that the students visited were in the danger zone. The danger zone ranges from 40 degrees to 140 degrees Fahrenheit. The temperature for each cooler tested ranged between 59 degrees to 65 degrees Fahrenheit. This means that since the coolers' temperatures are in the danger zone, people could get food poisoning by eating the fish bought from these vendors. The most vulnerable groups of people that are prone to food poisoning are the aging, the young children and the group of people who have chronic diseases. A new protocol is being added that instead of sampling cooler's temperature alone, the project is looking into gathering water samples and actual fish specimens in addition to the cooler's temperature to test exactly how safe the fish really is. This is an ongoing project and results are will be reported in the next accomplishment report.

IMPACT

Due to the shocking results of the project, all the fish vendors and markets survey included in this study now understand the relationship between time and temperature. Fifty percent of the participants increased their knowledge on proper storage, and twenty percent increased their skills and knowledge on sanitation aspect of their facilities. A hundred percent of the clients have started to practice safer food storing practices as a result of the study.

SOURCE OF FUNDS:

Smith Lever, State-local matching

SCOPE OF IMPACT:

The project will be limited to the island of Saipan.

EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM (EFNEP)

Key Theme – Human Nutrition

SITUATION

Through collaborations with the 4H program, the Nutrition Assistance Program (NAP), the Public School System, the Division of Youth Services and the Department of Public Health, EFNEP Program Aides continue to recruit limited resource-families and individuals with young children. Program Aides used the EFNEP curriculum; Eating Right is Basic (ERIB), developed by Michigan State University, to teach clients about the Food Guide Pyramid, feeding young children, and prenatal nutrition. Unfortunately, the culture of the CNMI is not reflected in the ERIB curriculum. Therefore, Program Aides had to adapt some of the material to include culturally appropriate information. One of the resources used was the CNMI Food Guide Pyramid, which emphasizes local food sources. Towards the end of the year, EFNEP staff and volunteers were trained by the University of Hawaii EFNEP State Coordinator to better deliver program services as well as ways to increase clientele. Moreover, she trained them to use the Food and Money Basics curriculum developed by the University of Hawaii, which is more culturally appropriate than the ERIB curriculum. Besides regular client outreach, EFNEP staff conducted workshops in local elementary and high schools to promote healthy food choices. Furthermore, culturally adapted nutrition education materials were distributed to homemakers, families, and youth at the various health fairs and events. Finally, EFNEP collaborated with other FCS programs and CREES Agriculture Extension and Research to develop the pilot project The Summer Youth Program (SYP). Basic food and nutrition education lessons were taught using Food and Money Basics curriculum as well as locally adapted material.

IMPACT

Due to the collaboration among various agencies and EFNEP, over 1500 families, individuals with young children, and youth were reached throughout the CNMI last year. In addition, there was about 70 youth and families with young children throughout the CNMI enrolled in EFNEP. According to the EFNEP evaluation reports, more than 80% of graduates showed improvement in one or more nutrition practices. The graduates learned topics such as making healthy food choices, preparing foods without adding salt, reading nutrition labels for fat and sodium content, having children eat breakfast, and feeling that the food and nutrition needs of their families are being met. Furthermore, evaluation results of workshops, which were attended by 500 elementary and high school students, showed that more than 60% of students understood how to make healthier food choices. Also, the 90% of The Summer Youth Program (SYP) participants demonstrated the ability to read nutrition labels, to identify food sources in the food guide pyramid, to make healthy 'pyramid' meals, and to make healthy food choices. Due to the success of SYP, it was agreed upon to become an annual summer event.

SOURCE OF FUNDS:

Smith-Lever 3(d), State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

PLANT PROTECTION PROGRAM

ñGoal 3: Healthy, well-nourished population **Key Theme: Human Health**

SITUATION

Proper pesticide handling and use can only improve human health, by reducing the risk of pesticide exposure to the consumer public and to farm laborers and food handlers. Proper regulation of toxic chemicals and appropriate training in their use form the foundation of safe use, to minimize risk of poisoning and damaging human health.

IMPACT

The 29 people who are now qualified to apply for and be licensed to handle the very dangerous RUP pesticides are the lowest number in recent history, except when all were expired. The requirements for passing the exams are much more stringent, requiring that those who desire to be licensed actually prove that they know their complete management system, including regulations, pesticide safety, handling, pest biology and recognition, and environmental (non-target) protection.

SOURCE OF FUNDS:
Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:
Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

FARM SAFETY PROGRAM

OVERVIEW

The low level of inputs and limited mechanization typifies Agriculture in the CNMI. Much of the physical work of farming is done by hired labor and/or by people of cultures other than the indigenous population. Due to the hiring practices and limited security offered to alien workers, farm accidents are rarely reported. Predominant accidents are thought to be from hand-tools, animal handling, and poor maintenance of surroundings and from heat exposure. Larger equipment such as tractors and tillage equipment that is common on the mainland is restricted to a few farms or to government services. Farm chemicals are restricted and due to costs, are not used extensively.

Key theme: Human Health

SITUATION

A survey was distributed to all directors of Health Services, Emergency Medical Services, Departments of Lands and Natural Resources requesting statistics of farm related accidents. No responses were received. In the absence of recorded accidents relating to agriculture, the program has been focused on general education and prevention especially amongst youth. Programs have been initiated through the 4H program to include Safety in elementary school programs and within the 4H program. In addition, food safety issues include education of people to adhere to withdrawal periods recommended post-application of pesticides. One Pesticide Applicator Training course was offered on each of the islands through the IPM Program. Farm visits regularly include the observation and discussion of safety standards for food crops. Food and Consumer Science representatives discuss safe handling procedures for foods with home clients.

IMPACT

Due to the lack of baseline statistics, no publishable results are evident. Anecdotal information seems to indicate a lack of concern for safe chemical handling and consequent food safety issues. Programs to address this issue must be developed in languages suitable for the farm workers and for the farm managers.

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

EXECUTIVE SUMMARY

OVERVIEW

Because of limited land area, invasion of harmful insects and weeds, the depletion of natural resources and the health of the CNMI people, protecting the environment have always been a high priority for CNMI CREES. Steps have been taken to protect the environment by educating extension agents, partner agencies, farmers, families and the community, about the options and practices that are available to protect our natural resources. CNMI CREES's IPM program has formed an environmental protection team, which tests and recommends alternative methods of controlling pests and diseases while producing good crops. These IPM methods reduce farmers' dependence on pesticides and chemical fertilizers, and protect food, soil, and water resources from chemical contamination.

OUTPUT INDICATORS

To help minimize pesticide use, the Plant Pathology Program has conducted research aimed at reducing the use of chemical pesticides by finding effective botanical pesticide alternatives that will have minimal environmental impact. Prior to fiscal year 2000, there were many uncertified pesticide applicators that were handling all types of pesticides. The new Pesticide Applicator Training courses were redesigned, requiring a series of pesticide safety training, certification workshops and exams in order to help train the applicators and keep the CNMI's environment, food supply and people safe. The IPM Project also conducted crop protection and pesticide safety workshops on the islands of Saipan, Tinian and Rota to support the IPM Crop Scouting teams and programs.

The Neem Extract Management Program's relevant factors include the high cost of the chemicals, their sporadic availability, the amount of time required to receive the product from the US mainland, and the short shelf life of chemicals due to the high temperatures and humidity of the tropical climate. Most of the agriculture parks are located over the island aquifers, raising increased public concerns regarding the possibility of pesticide residues in the drinking supply. Pesticide runoff is extremely damaging to the surrounding coral reefs, aquatic life, and marine habitats causing the eventual destruction of the ecosystem encircling the islands. Organic crop production and sustainable integrated pest management are newly reintroduced concepts to the region and require specific projects to successfully demonstrate their use to local growers.

In addition to the projects and programs aimed at reducing pesticide use, the Plant Nutrition and Soil Management Program began projects aimed at reducing the over-use and mismanagement of fertilizers. The program collected soil samples that were analyzed off-island. Fertilizer recommendations have been made to over 20 farmers.

OUTCOME

Program development and implementation priorities were key issues to many of the programs related to goal 4. In the Plant Protection program, an IPM Technician training program was designed, developed, and delivered, through a 2-week program of classroom and field activities and lectures. Over 30 farmers, college staff, and government agency personnel participated in the program; nineteen passed the exams and satisfied the requirements to become IPM crop scouts and advisors through the program. Subsequent to the training program, monthly working visits to each island staff provided additional training and in-field practice to develop the crop scouting system, which is being implemented in 2001. This scouting system, with specially developed field data recording forms, was designed and field-tested in late 2000; evaluation of field methods and improvements of the system will be on going. In the PAT project, CREES management and staff committed resources and manpower to a complete redesign and formalization of the PAT training programs and licensing through CNMI's Division of Environmental Quality (DEQ). Beginning in June, four PAT programs were offered, starting with Category 5, Commercial pest control for structural, institutional, and public health pest control. A PAT trainer from the University of Guam was hired to deliver this program, while NMC staff learned the methods and contributed lectures and supporting information as needed. Three PAT programs for private pest control certification, mostly targeted at farmers and extension workers, were conducted over the following three months. Due to high costs and dangers of pesticide use, the Neem Extract Management project focused on finding alternatives to the use of chemicals and pesticides. The Plant and Soil Nutrition Management Program provided recommendations to farmers on fertilizer use.

IMPACT

With the collaboration efforts between the NMC-CNMI CREES programs and various internal and external partners, over several thousand farmers and individuals were reached last year. In addition, stakeholders increased their clientele numbers because of our collaborative efforts. In the PAT program, twenty-nine people are now qualified to apply for and be licensed to handle the very dangerous RUP pesticides. The requirements for passing the exams are much more stringent, requiring that those who desire to be licensed actually prove that they know their complete management system, including regulations, pesticide safety, handling, pest biology and recognition, and environmental (non-target) protection. The Neem Extract management project has potential benefits that include the economic advantage of using locally available materials, ease in preparation and application within an integrated system, and the environmentally friendly use of a natural plant extract with proven non-toxicity to humans, animals, wildlife, and fish. This research will help anyone trying to provide alternatives to the synthetic, restricted pesticides currently damaging our land, our water, and us. The principal impact of the Plant Nutrition and Soil Management program is the detailed set of recommendations provided to 20 farmers on the most economical use of nitrogen and phosphorus fertilizers. Due to recent activity in all the programs involved, the major impacts and results are yet to be determined.

ASSESSMENT

All Agriculture Research and Extension activities are in line with the overall NMC CNMI CREES Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. For example various activities in the Plan of Work were started late or placed in a different year because of staff turnover.

SUPPORT

Total expenditures equal $348, 496 including approximately five FTE’s.

PLANT PROTECTION PROGRAM

INTEGRATED PEST MANAGEMENT

The Integrated Pest Management (IPM) program was started from the beginning of Fiscal year 2000. Field implementation needs were measured by means of a farmer KAP (Knowledge, Attitudes, and Practices) survey, carried out by CREES staff on the islands of Saipan, Tinian, and Rota. About 100 farmers were surveyed, using a one-to-one formal personal survey. Results were tabulated, and used to set the program development and implementation priorities. A training program was designed, developed, and delivered, through a 2-week program of classroom and field activities and lectures. Over 30 farmers, college staff, and government agency personnel participated in the program; nineteen passed the exams and satisfied the requirements to become IPM crop scouts and advisors through the program. Subsequent to the training program, monthly working visits to each island staff provided additional training and in-field practice to develop the crop scouting system, which would be implemented in 2001. This scouting system, with specially developed field data recording forms, began its operation in late 2000; evaluation of field methods and improvements of the system will be on going. Results of each field scouting trip, done weekly, are shared with the client farmers, and logged into a farm data base for long-term crop pest impact evaluation and program impact assessment studies, to be done after the program has been established for at least two years. With these newly formed IPM Protection teams, the CNMI now has certified natural resource protectors.

Key Theme: Agricultural Waste Management

SITUATION

In conjunction with training provided by the Pesticide Applicators' Training program, farmers are taught how to use only the correct type and amount of pesticides, thus aiming at having no waste products in the form of excess or expired pesticides and agricultural chemicals. This helps prevent unnecessary diseases and adverse environmental side effects. Proper disposal of excess or expired pesticides are also taught during PAT classes.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide; training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Biodiversity/Biological Control

SITUATION

The IPM program advocates all pest management techniques and measures that will enhance biodiversity and biological control components of crop protection management. Individual crop pests are monitored for natural predators, and appropriate natural enemies are introduced to help control the pest populations without using pesticides when the possibility exists.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Hazardous materials

SITUATION

The IPM program advocates the use of only the safest pesticides, and then only when it can be demonstrated using economic measurements when they are needed. Farmer and IPM technician training programs stress the importance of safe use of chemicals.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Pesticide Application

SITUATION

IPM teaches farmers to apply pesticides correctly, and only when needed. The advice of IPM scouts who visit the farms weekly should be used in making their crop protection decisions.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching. 1 FTE for about 6 months.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Sustainable Agriculture

SITUATION

IPM activities, to advise farmers on safe and optimal use and non-use of farm inputs will help clients develop more sustainable agricultural systems on their small-hold and leased farms.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching. 1 FTE for about 6 months.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Pesticide Applicator Training Project

OVERVIEW

The Pesticide Applicators' Training (PAT) project was suspended in 1997, due to insufficient staff interest and professional commitment. At the beginning of year 2000, all Pesticide Applicators' Licenses in the CNMI had expired, and there was great demand for re-establishment of the training programs. Management and staff committed resources and manpower to a complete redesign and formalization of the PAT training programs and licensing through CNMI's Division of Environmental Quality (DEQ). Beginning in June, four PAT programs

were offered, starting with Category 5, Commercial pest control for structural, institutional, and public health pest control. A PAT trainer from the University of Guam was hired to deliver this program, while NMC staff learned the methods and contributed lectures and supporting information as needed. Three PAT programs for private pest control certification, mostly targeted at farmers and extension workers, were conducted over the following three months. One program was delivered on each island, Rota in July, Tinian in August, and Saipan in September. In total, over 100 people participated in these 3-day training workshops. Of those who sat for the exams, 68 passed the basic exams, certifying their understanding of pesticide safety, handling, and regulations. These applicants received a certificate of successful course completion. Of these 68, twenty-nine also passed the additional category technical and math exams, qualifying them for full licensing to handle restricted use pesticides under the DEQ-administered USEPA pesticide laws. These 29 people are now the only ones who can legally purchase and use the highly toxic chemicals, which are labeled only for restricted use.

Key Theme: Food Safety

SITUATION

The safety and quality of our food supply is improved when farmers and commercial pests control operators handle and use pesticides properly, and with appropriate skills. These training programs were designed to educate the public and pesticide users in the safety, handling, and regulations of pesticide use. They also educated the participants in how to recognize their management problems and make well-reasoned pest control decisions. When put into practice, these correct decisions, to use the correct pesticides for a given situation, and then only when needed, will produce a safer food supply and protect worker safety.

IMPACT

The 29 people who are now qualified to apply for and be licensed to handle the very dangerous RUP pesticides are the lowest number in recent history, except when all were expired. The requirements for passing the exams are much more stringent, requiring that those who desire to be licensed actually prove that they know their complete management system, including regulations, pesticide safety, handling, pest biology and recognition, and environmental (non-target) protection.

SOURCE OF FUNDS:

Smith-Lever 3 (d).

SCOPE OF IMPACT:

Commonwealth specific. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Integrated Pest Management

SITUATION

The foundation of IPM is built upon sound decision-making for the use of toxic pesticides. These training programs empower pesticide users to understand if, when and how to use which pesticides, and to make the decisions based on economics and environmental safety. This is a very important management skill for IPM practitioners to have, and will greatly improve their chances of success.

IMPACT

Yet to be measured. IPM scouting records will help verify the acceptance and practice.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Pesticide Application

SITUATION

Training in the understanding of pesticide regulations, pesticide handling and application is what the Pesticide Applicators' Training program is all about.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

Key Theme: Water Quality

SITUATION

Proper application of toxic chemicals will minimize the risk of contaminating the vulnerable water resources of the CNMI. Appropriate training in pesticide application is thereby required.

IMPACT:

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3 (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide. Training plans and modules will be shared with Guam and other ADAP and Micronesian agencies that wish to share the materials, including SPC.

NEEM STUDY

OVERVIEW

Anthracnose disease of vegetables and fruits is a limiting factor in the commercial production of these crops in the CNMI. The use of synthetic commercial fungicides is not commercially, nor environmentally, sustainable on small Pacific islands with delicate ecosystems. Biological pest control and a sustainable, integrated management system must be utilized whenever possible to reduce the destructive effects of pesticide uses.

Key Themes – Biological Control, Integrated Pest Management, and Sustainable Agriculture

SITUATION

Since the 1950's, the use of chemical pesticides has dramatically increased within the CNMI. The importation of these chemicals comes with a very high price to farmers and to our ecosystem. Relevant factors include the high cost of the chemicals, their sporadic availability, the amount of time required to receive the product from the US mainland, and the short shelf life of chemicals due to the high temperatures and humidity of the tropical climate. Most of the agriculture parks are located over the island aquifers, raising increased public concerns regarding the possibility of pesticide residues in the drinking supply. Pesticide runoff is extremely damaging to the surrounding coral reefs, aquatic life, and marine habitats causing the eventual destruction of the ecosystem encircling the islands. Organic crop production and sustainable integrated pest management are newly introduced concepts to the region and require specific projects to successfully demonstrate their use to local growers.

IMPACT

Previous work in this 3-year project focused on the use of ethanolic extracts; FY2000 (Year 2) was focused on the use of aqueous extracts. During the reporting period, five incremental levels of neem extracts were compared to non-extract treated petri plates of fungus isolates obtained from symptomatic, infected mango, papaya, and pepper plants. Protocols using two time

sequences were used to test concentrations of extract. These trials were inconclusive and have been continued into FY2001, (Year 3), and the last year of the project. Contamination was a serious problem in the laboratory during this reporting period; we lost eight of our trials to bacterial contamination. Increased attention to sanitation was implemented and antibiotics added to the extracts. Protocols were revised, as it was also suspected that there was insufficient extraction of the neem compounds in the aqueous trials to provide for a meaningful study. The tissue culture component of the project was initiated in August with the training of key personnel for rapid propagation.

The potential benefits of this study include the economic advantage of using locally available materials, ease in preparation and application within an integrated system, and the environmentally friendly use of a natural plant extract with proven non-toxicity to humans, animals, wildlife, and fish. Neem plant materials traditionally have a high rate of grower acceptance in the more underdeveloped countries of the world. Currently the paucity of research and lack of sufficient quantities of commercial product limit the acceptance of neem in the U.S. Through the documentation of the fungicidal activity, in addition to its proven insecticidal, nematicidal, and enhanced nutrient uptake capability for major crop plants, the use of neem plant extracts has worldwide applications. This research will help those of us trying to provide alternatives to the synthetic, restricted pesticides currently damaging our land, our water, and ourselves.

SOURCE OF FUNDS:

Hatch, State-local matching.

SCOPE OF IMPACT:

Pacific region, Commonwealth Wide.

PLANT NUTRITION AND SOIL MANAGEMENT

OVERVIEW

There is a concern for the potential impacts of uninformed fertilization practices on water quality. Use of sample-based recommendation systems in fertilizer management to prevent over-application and excessive loss of fertilizer to the environment is an environmental 'Best Management Practice,' as defined by USDA.

Key theme: Soil Sampling

SITUATION

Twenty recommendations provided to CNMI producers were distributed on the basis of soil-sample analyses in FY 2000. An adequate database for assessing the status of Rota's agricultural soils was collected and evaluated in FY 2000. Preparations were in mid-stride at the end of FY 2000 to conduct plant tissue samplings to extend the power of our recommendation system.

More than 30 samples were collected in the Kagman Agricultural Park, an area of intensive commercial vegetable production on Saipan. To date, sample analyses results are yet to be determined.

IMPACT

The principal impact of this program so far would be detailed recommendations to 20 farmers on the most economical use of nitrogen and phosphorus fertilizers. We have still not developed the fertilizer sources and application technologies to make a farm-level impact on the more exotic problems such as calcium or iron deficiency.

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

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

EXECUTIVE SUMMARY:

For 13 years, the Cooperative Research, Extension and Education Service (CREES) through its Family and Consumer Science and the Agriculture Research and Extension programs has worked hard to help CNMI youths, families, limited resource individuals, and agriculturists enhance their economic opportunities and improve their overall quality of life. The educational programs deliver research-based information and education in the home, classroom, farms and community group settings to address and help improve their economic opportunities and face the social challenges that they face daily. The results are well informed, economically prepared individuals who use the skills, tools and newly learned knowledge to improve their overall quality of life and seek economic opportunities.

The Family and Consumer Science and Agriculture Research and Extension programs that address the health needs of families, individuals and youth in the CNMI are the *Aquaculture Development Program, Family Development and Resource Management Program, Farm Safety*

Programs, Pineapple Research and Pilot Production Project, Plant Protection and Crop Production programs.

OUTPUT INDICATORS

In the past year, FCS and Agriculture extension agents have developed culturally appropriate educational materials, that are used as supplemental information to pre-existing curriculums and introduced new methods of obtaining economic opportunities which provided information on economic practices and non-labor intensive practices. Many of these educational resources, economic opportunities and non-labor intensive practices have been made available to homemakers, school-aged children, limited resource individuals and farmers. A variety of different workshops and training sessions in the areas of aquaculture and hydroponics development, money management, farm safety, farm management, IPM, PAT, weed control were conducted in the classroom or on site in order to promote means of economic opportunities and improve their quality of life. News releases on economic programs, practices, workshops and training were used to attract interested individuals and the general public. Additionally, the CREES official web site was created to serve as another form of outreach to the community. The Pineapple Research and Pilot Production project focused on increasing the availability of pineapples and focusing on a "niche market" that could eventually bring additional revenues into the CNMI's economy. Prior to the research, pineapple was only imported and was usually poor in quality, now the CNMI can produce good quality pineapples and eventually export it.

OUTCOME

Through collaborations with the Division of Environmental Quality, the Nutrition Assistance Program (NAP), the Public School System, the Department of Public Health, and the Department of Lands and Natural Resources, Farmer Cooperatives, FCS and Agriculture Research and Extension has reached over 7000 families, individuals and youth throughout the CNMI. The creation of new jobs, employment opportunities and businesses in the fields of landscaping or aquaculture is now high in demand.

Youth farm safety programs are being implemented with the help of the 4-H clubs of the CNMI. Farm safety and workforce safety programs work hand in hand to protect individuals from

committing farm work related accidents and are used to teach the laborers the proper and safe techniques of operating farm machinery. The IPM and PAT programs are providing businesses with the opportunities to be legally certified in pesticide application and provide another form of competitive advantage.

Additionally, FCS extension agents conducted workshops to promote the integration of money management education into the current public school system's curriculums. As a result, participants (mostly students, public schoolteachers and administrators) learned ways to include money management education into their lesson plans and daily lives. The parenting and limited resources sewing programs help families find ways to prolong the use of their limited resources and how to spend money wisely.

Due to a limited number of extension agents, every program is required to share resources and clientele. As a result of the program's redirection, CREES program participants developed more knowledge and skills to be productive members of the family and the community. Multitudes of services are now available to the participants.

IMPACT

With the collaboration efforts between FCS and Agriculture Research and Extension and various internal and external partners, over 60 students now have economic opportunities by operating and maintain their own aquaculture facility. Through the aquaculture program, students, families and farmers that have facilities not only produce their own fish, but can grow their own vegetables through the aquaponics system. Now days, farmers are practicing effective farm management and are cutting all unnecessary costs. They do so by cutting down on hired laborers and using the product Round Up to kill weeds. The money management program made headway when they started a money management course in the public school system. MOU with partnering agencies have provided access to many limited resource families to participate in the limited resource-sewing program. Farmers on the islands of Tinian and Rota are working on establishing a "niche" pineapple empire in the CNMI. Participants who completed the various CREES programs are now more financially and economically aware individuals with the skills to be a productive member of the family and society.

ASSESSMENT

All Family and Consumer Science and Agriculture Research and Extension activities are in line with the CREES Plan of Work. Various activities in the Plan of Work had to be placed in a different year because of staff turnover. Impacts and results for recently approved programs will be reported next fiscal year.

SUPPORT

Total expenditures equal $487, 895 including approximately seven FTE's.

Aquaculture Development Program

Key Theme- Youth Development /4-H

SITUATION

As part of its efforts in promoting the importance of Aquaculture, the Aquaculture Development Program began collaborations with the high school on Saipan. A program was established which allowed Aquaculture students from the high school to attend a two-week training at the Aquaculture facility located at the main campus. The training included the basic principles of Aquaculture and how to start up and maintain a system at home. In addition to the collaboration with the high school, the Aquaculture Development Program has organized several grade school field trips to the Aquaculture facility.

IMPACT

More than 60 students have completed the program and continue to increase. Students have continued their interests by building small systems at home. Some students have also continued their interests by taking additional training opportunities through the high school's Vocational Education Program.

SOURCE OF FUNDS:

Smith-Lever 3b&c State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme- Supplemental Income Strategies

SITUATION

The Aquaculture Development Program has begun building cheaper alternative hydroponics trough that can be coupled with fish tanks. By connecting a hydroponics trough to an existing fish tank, production of vegetable crops can be achieved thus increasing profits. These troughs were originally intended to improve filtration of recirculating tank systems. These troughs are made of locally available materials that are easily constructed and are also easily moved. Different crop trials have been completed to determine crops most suitable for this system.

IMPACT

Farmers will not only produce fish but will also produce vegetables thus increasing their income opportunities. Numerous leaf crops were found to do well in these troughs giving farmers options on what they would like to plant.

SOURCE OF FUNDS:

Hatch, State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

CROP PRODUCTION IMPROVEMENT PROGRAM

WEED CONTROL

OVERVIEW

A large fraction of the local population does not have the educational background to compete for the middle-class salaries paid by government and certain businesses. Yet farming offers few lucrative positions due to poor farming methods.

Key Theme – Jobs and Employment

SITUATION

The majority of the farm workers in the CNMI are contract laborers from the countries of the Philippines, China and Bangladesh. Part of this reason is the low wages due to the low return on investment (ROI) of farming using existing methods of weed control. Roto-tilling the area between the rows every several weeks, followed by hand-pulling weeds near the base of the plant are the general practices of weed control. Such high-labor control of the severe infestations of Nutsedge (Cyperus) and Morning Glory (Ipomoea) make farming a very undesirable goal for most local people. If federal immigration legislation revokes the work visas of most of these farm workers, local workers are poised to fill the job slots. If weed control can be made a non-issue, vegetable production will be more attractive to local workers.

IMPACT

Our research and extension efforts on two farms on Saipan and one farm on Rota have shown very acceptable weed control through the technique of two sprays of glyphosate (Roundup) before planting of vegetable crops. This herbicide has very low toxicity to the environment. After soil preparation, the Nutsedge usually grows into a thick carpet in three weeks. After an initial spraying, two weeks later another less-dense growth of Nutsedge reappears. Once this re-growth is sprayed, the vegetable crop can be planted with minimal weed competition. Several farmers have already adopted the use of Roundup.

SOURCE OF FUNDS:

Hatch and Smith-Lever, State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme: Promoting Business Programs

SITUATION

The climate and soils of the Commonwealth of the Northern Mariana Islands' (CNMI), is ideal for producing a wide range of vegetables through out the year. However vegetable production, in the commonwealth, is limited to relatively few traditional crops (cucumbers, watermelon, okra,

egg- plant, tomato, etc.) and is highly seasonal. Only small amounts of vegetables are produced during the wet months of July - October. As a consequence, a high proportion of the vegetables, consumed in the CNMI, is imported from such places as California.

An excellent opportunity may exist to increase the role of agriculture in the CNMI, by locally growing more of the imported vegetables consumed, and by exporting more produce that has a comparative advantage. However the marketing system, in the Commonwealth, has to be improved. Farmers prefer to be informed, prior to planting, of the prices they can expect to receive for their produce. When making decisions on imports, retailers need estimates of the amounts of high-quality, locally grown produce that will be available a few months in the future. Further, the marketing costs for locally grown produce, should be kept as low as possible, to help insure an advantage over imported vegetables.

IMPACT

A marketing specialist was hired to undertake this project. A 3-month professional service contract was extended an additional 5 months for a total of 8 months, ending June 30, 2000. The specialist has not submitted a written report of his findings (as of November 2000) and as a consequence the impact is yet to be determined.

SOURCE OF FUNDS:

Hatch, State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

ANALYSIS OF COSTS AND RETURNS AND COMPARATIVE ADVANTAGE OF VEGETABLE PRODUCTION

Key Theme: Jobs and Employment

SITUATION

The farm sector of the CNMI is not currently a potential employer for local people other than farm owners/lease holders. This is largely due to the availability of low cost foreign labor. However, it is not clear whether farm operations are profitable enough to pay acceptable wages to local laborers in the event of federal restrictions on the use of foreign labor. It is also not clear whether current farm operations are providing positive net returns to farm owners or lease holders.

IMPACT

The analysis of costs and returns is focused on determining which crops are most profitable as well as which crops can potentially compete with imported crops. Once this determination is made the information will be provided to farmers so that they can better plan their farm operations and improve profitability. Improved farm profitability should lead to enhanced farm sector income and possibly job creation for local workers.

SOURCE OF FEDERAL FUNDS:

Hatch, State-local matching

SCOPE OF IMPACT:

Commonwealth Wide.

PINEAPPLE RESEARCH AND PILOT PRODUCTION PROJECT

OVERVIEW

One of the greatest constraints to agricultural development on Rota and Tinian is the lack of transportation and storage for a consistent market. There is an on-going need to find non-perishable crops to allow for prolonged harvest, simple storage and transportation. Pineapples are in local demand for home consumption and hotel markets. They can be harvested at varying degrees of ripeness to allow for shipping to off-island markets and hold up well in transport.

Key Theme: Niche Market

SITUATION

Rota and Tinian both have more land than is needed to feed the local population. With the introduction of improved varieties of pineapples, there is the opportunity to produce a fresh, well-accepted product with potential for export to Saipan and Tinian. The potential exists to ship to the Guam market with simple phyto-sanitary procedures. Further potential is in the added value of processing to jams, dried/candied fruit and alcohol. Any added value will require some labor and add to local jobs.

IMPACT

To date – Approximately 10,000 crowns of the Hawaiian Smooth Cayenne variety were distributed to more than 40 clients on Rota and Tinian. On Tinian, CREES staff sprayed 2-year old plantations with Ethephon ™ to force flowering early in FY 2000. Pineapple fruits in commercial quantities were harvested for the first time on Tinian in late FY 2000. Twelve plantations on Tinian with about 3000 plants total were forced to flower. Of those, three planters sold commercial quantities of fruit. On Rota, due to the length of time to first harvest, there have been no visible results other than the presence of growing pineapples on various farms on the island. It is evident that there are tremendous differences in the capacity of certain island soils to produce pineapples. The second distribution took advantage of preferred pineapple soils. Farmers in the first distribution that planted on poor soils have mostly abandoned efforts. Approximately half of the first material is still properly managed and should produce in late summer 2001.

FAMILY DEVELOPMENT AND RESOURCE MANAGEMENT PROGRAM

OVERVIEW

Due to the economic crisis in the Asian region, the economy of the CNMI is also suffering. More people than ever are struggling to "make ends meet" and are looking for better ways to effectively manage their money and prolong their limited resources.
The CNMI is dealing with a growing incidence of child abuse and neglect, a high rate of teenage pregnancy and a concerning rate of alcohol and drug abuse among its population. Self-esteem related issues are known to play a great role in many of these social problems. Lack of knowledge in effective parenting practices is also seen as a strong contributing factor.

Key Theme – Parenting Program

OVERVIEW

The Coordinator for the Parenting Program took a long leave of absence due to a pregnancy complication, which started around August 1999, after giving birth to a healthy girl; she again was required to take an extended leave of absence. It was in July of 2000 when she officially resigned. However, the Parenting Program was not totally paralyze for the Family Consumer Services (FCS) extension agents continue to collaborate with external agencies as well as

providing Parenting lessons and training to clients who were referred by the Division of Youth Services, Karidat, and from the Ayuda Network.

Although, there is no report of any significant program accomplishment from September 1999 to October 2000, FCS extension agents and program leaders all contributed their time and efforts in addressing the program main focused Goal and that is to enhance economic opportunities and quality of life. The Family and Consumer Services Program just recently hired a Parenting Program Coordinator and the individual is expected to report to work on the first week of May 2001.

IMPACT

In an effort to provide quality Parenting services, all FCS extension agents were required to attend the Parenting Symposium, which is an annual event, and other Parenting related training, workshops and seminars.

SOURCE OF FUNDS:

Smith-Lever 3b&c, State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme – Money Management

OVERVIEW

The MONEY 2000 is a Cooperative Extension System program designed to help presenters and participants to increase their NET WORTH significantly through better spending and saving habits. In October 1999, a Home Economic teacher at Marianas High School conducted a Money Management survey to her 234 students. The objective of her survey was to determine if her students are spending money earned or allowance given to them wisely. The results of the survey was so alarming, for 99% of the 234 students who responded to the survey indicated that they spent an average of $2,000 per year on junk food, partying with friends, even sharing their cash allowances with friends and for other unnecessary expenses. Furthermore, 100% stated that they are always broke. As a result of her survey, the MHS, Home Economic teacher requested FCS-CREES Program to conduct a Money Management Workshop. FCS presented the MONEY 2000 System Program to the 234 students who participated in the survey and the workshop. An evaluation reviewed that 75% of the students changed their behavior realizing the need to budget and spend wisely also that 100% claimed to have increased their knowledge.

Despite FCS limited resources (reference materials) on MONEY 2000 and no actual training, participants were taught Basic Credit Management Skills, Creating a Spending Plan, Living on a Fixed Budget and the Six Step Plan from the MONEY 2000 Program. The other Money Management Workshop was conducted at the request of a Church Group Leader. There were 32 participants and 100% of the participants are considered limited resources. Although great emphasis was geared on the subject of Money Management and Food Stamps smart budgeting and shopping, other FCS available program areas were also taught. They are as follows Sewing for Limited Resources, Container Gardening, Nutrition, Diet and Health and Saying NO to Smoking and Drugs.

IMPACT

The workshop evaluation reviewed the effectiveness of the MONEY 2000 System program. FCS Money Management Coordinator and Assistance will be required to attend workshop and training on MONEY 2000 System program. Money Management Program will develop curriculum on Money Management for Limited Resources, Food Stamps recipients and for Elementary and High School level.

SOURCE OF FUNDS:
Smith-Lever 3b&c, State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme – Sewing for Limited Resources

OVERVIEW

The Sewing Program for families with limited resources is the corner stone of FCS Program. Individuals signing up for the Sewing for limited resources are mainstreamed into the EFNEP and Family Financial Management Program within FCS Program. Upon completion of training (hand on experiences), an exit evaluation is administered to determine the level of knowledge gain before participants are officially informed to participate in a simple Graduation Ceremony. The Program is in the process of developing a Sewing Curriculum not for a degree program but more or less for individuals who are considered limited resources (income, skills, knowledge, and resources). Upon completion, the Sewing Curriculum will be presented to the Merit Review Committee. The Merit Review Committee composed of the Associate Director of CREES-FCS Program, EFNEP Program Leader, Money Management Program Leader, Parenting Program Leader and the Community Resource Development Program Leader.

Three graduations took place within this reporting period (September 1999 to October 2000). The Program required participants to be able to sew potholders, aprons, pillowcases, tablecloth covers, table skirts, curtains, and clothing for male/female infants, adults and formal bridal outfit. Participants are also required to sew their graduation outfit.

Participants' finished products are kept for display during graduation ceremony and released to them after graduation. As an incentive, the Program gives each of the graduates four yards of the different kinds of fabrics, two hand full of buttons in different shapes and colors, 10 zippers and seven to eight different colors of threads. Contact with participants does not end after their graduation. The Program does follow up to see if knowledge gained by participants continue to be applied, the Program also offer to issue a good recommendation letters for employment and recommends that they passed on the knowledge gained to friends, families and neighbors. The fabric materials, buttons, scissors, zippers, threads are all donations from the many Saipan Garment Factories.

Aside from the actual sewing, participants are thought the different parts of the sewing machine and the proper ways of cleaning and maintaining the machine. The Sewing Program has a youth component and offers classes in flower arrangement, using beads for making bracelets, necklaces and earrings and the recycling of newspaper for weaving Easter baskets for children, beautiful fruit baskets etc.

IMPACT

The Sewing Program for families with limited resources is in great demand here in the CNMI. Lately, a good number of federal programs catering to low-income families such as the Marianas Housing Authority requested FCS to extend services to their low-income tenants.

The Sewing Program Coordinator was able to reach and deliver informal out of the classroom sewing lessons to more than 300 clients. The 300 clients were able to complete five lessons but were not able to continue due to transportation problems or no baby sitters. Thirty percent of the 300 clients completed the Sewing Program requirements and graduated. The remaining seventy percent continue to increase their knowledge in Sewing at their convenience time. Out of the

300 clients, seventy five percent can now make children cloths and able to manage or make good use of whatever available resources they have. One hundred percent of the clients increased their knowledge in Sewing with limited resources.

The CRD Coordinator negotiated the MOU with the Marianas Housing Authority (MIHA) Board of Directors for Community Programs. In order for FCS to provide quality services and for MIHA tenants to equally acquired knowledge and skills from the many FCS programs, the CRD Coordinator requested that a Model Home be provided by MIHA at the site, for the majority of the MIHA tenants do not own a vehicle.
In December 2000, the Board of Directors, Chairman for Community Programs endorsed his support for MIHA to avail a Model Home for FCS Programs to use as classroom and lab. The FCS Sewing Program continues to get support from the Saipan Business Community especially from the garment factories.

SOURCE OF FUNDS:
Smith-Lever 3b&c, State-local matching.

SCOPE OF IMPACT:
Commonwealth Wide.

PLANT PROTECTION PROGRAM

FARM SAFETY PROGRAM

Key Theme: Youth Farm Safety

SITUATION
There has been no concentration, nor realization of the dangers of the agriculture occupations promoted previously in the CNMI. There are no statistics of the accidents that have occurred in relation to agriculture. Consequently, the youth of CNMI have had no training in the dangers associated with life on a farm. The youth, however, are recognized as an access point to the

family, and an available coherent group through which a message can be transmitted. Therefore, this is the focus of the first efforts to spread the message throughout the family.

Programs are being developed with the 4H program and school agriculture programs. The focus will be to raise the level of awareness within the youth in such areas as heat stress on the farm, a safe environment and surrounding on the farm and safe use of hand tools. Children are also taught the safe use of small, mechanized tools, safety with farm animals and chemical safety. Competitions have been planned to adapt existing mainland children's safety programs to include locally identifiable farm situations. Posters, coloring books and videos are being developed to relate the message through the use of local settings and themes. Inter-Island competitions to be sponsored by the Farm Safety Program and to be judged at the local agriculture fairs will encourage the youth to imagine safety concerns on Chamorro farms.

IMPACT

No impact is yet measurable. Approximately 75 members of local 4H programs will be involved. 4H agents will also address local elementary schools where the potential audience is approximately 3-400 students.

SOURCE OF FUNDS:

Smith-Lever 3(d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme: Farm Safety

SITUATION

No previous effort has been undertaken to address the issue of farm safety in the CNMI. No statistics exist to indicate the types of hazards affecting farm workers in CNMI. Laborers on farms in the CNMI are typically alien workers or foreign leas-holders. In both cases, different

languages and cultural norms must be addressed. For native Chamorro farmers, the lack of information and lack of perceived dangers has made it difficult to draw an audience to discuss Farm Safety issues.

EFFORT

Exhibits have been developed for local fairs and open house displays to promote safety with machinery, especially where children are involved. An advisory council has been established on one of the islands to help focus the work in the future. Other efforts have been to include chemical handling safety as a major portion of the Pesticide Applicator Training sessions. Slow moving vehicle signs have been distributed to one of the local Departments of Lands and Natural Resources for use on the tractors and machinery that normally travels on public roads. An effort has been made to collaborate with other territories to develop material that is common to all the islands.

IMPACT

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever 3(d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme: Agricultural Financial Management

SITUATION

Implementation of IPM practices by client farmers will enhance their record keeping, as they learn to record their management practices with the IPM scouts/advisors. The IPM program teaches them to make sound crop protection and cultural management decisions, based on assessed needs, rather than tradition or time of the calendar for expensive chemical use. This will improve their decision-making processes, resulting in better farm economics.

IMPACT

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on these activities.

SCOPE OF IMPACT:

Yet to be measured. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand.

Key Theme: Farm Safety

SITUATION

Training programs provided through the IPM program teach client farmers and laborers to handle farm chemicals safely.

IMPACT

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on these activities.

SCOPE OF IMPACT:

Yet to be measured. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand.

Key ñTheme: Work Force Safety

SITUATION

Training for safe and reduced use of agricultural chemicals enhances the safety of the farm laborer work force. In addition, publicity on land owners' and contractors' requirements to provide for worker safety are improved by recent laws which support the IPM program demonstrations of safe and "use only when necessary" lessons about agricultural chemicals.

IMPACT

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on these activities.

SCOPE OF IMPACT:

Yet to be measured. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand.

PESTICIDE APPLICATORS' TRAINING

ñGoal 5: Enhanced economic opportunity and quality of life.Key Theme: Farm Safety

SITUATION

Proper training in pesticide use and handling will minimize the risk of exposure to toxic chemicals by the farm labor force.

IMPACT

Yet to be measured.

SOURCE OF FUNDS:

Smith-Lever and USEPA funds, State-local matching. 3 FTE spent time on these activities.

SCOPE OF IMPACT:

Yet to be measured. This is a state (Commonwealth) specific program. Results of this program development and implementation will be shared with Guam, American Samoa, other members of ADAP, and other members of this Western Pacific region, including Secretariat for the Pacific Community (SPC) countries and territories, supported by Australia and New Zealand.

MANAGEMENT GOAL:

Cooperative Research, Extension and Education Service Communications Program

EXECUTIVE SUMMARY

The Northern Marianas College – CNMI Cooperative Research, Extension and Education Service Communications Program is a management program that has cross-functional duties that are indirectly related to the five national goals set by the CSREES and the USDA. The Communications Program is designed to work closely with both the Agriculture Research extension agents and Family and Consumer Sciences extension agents of the federally funded NMC-CNMI CREES programs in order to gather, produce and disseminate up to date and adequate information to agriculturists, extension agents, clients and major stakeholders. Since the NMC-CNMI CREES is situated on three main islands in the Marianas chain, Rota, Tinian and Saipan, a means for a much quicker way to disseminate information was needed. In order to connect agriculturists, extension agents, clients and major stakeholders with each other and provide them with the most up to date and relevant information, the NMC-CNMI CREES Communications Program uses the following mediums: the World Wide Web, press releases, brochures, publications, slides, workshops, posters, audio and video programs.

OUTPUT INDICATORS

To help disseminate information and meet the program's goals, a new Communications Program Coordinator was hired. The Coordinator's first three months were dedicated to training and preparing the NMC-CNMI CREES web site, as well orientating him to the CREES program. The Communications Coordinator was tasked to design create, and maintain a new web site with numerous links to partner institutions and agricultural and FCS related sites. The coordinator was also tasked to produce brochures, bulletins, pamphlets, and other printed materials useful to CREES clientele. In addition, the coordinator has to undergo the necessary training to produce slides, audio, radio, and television and video programs.

OUTCOME

Within a few short months, the communications coordinator accomplished many things. He designed, created and maintains the new web site. He has found and created relevant and useful agriculture and FCS links that provides extension agents and clients with a virtual library. Numerous bulletins, brochures, pamphlets, newsletters, press releases and other printed materials were designed and disseminated into the public.

IMPACTS

With all the new and improved services that the communications program has provided information has been successfully disseminated to the public. The creation of the web site provides extension agents and clients with around the clock access to information and serves as a means of communicating through email. Forms of media have been increased and target audiences have been expanded. A questionnaire is being designed to help assess the overall impact of the program.

ASSESMENT

All communications program activities are in line with the CREES Plan of Work. Various activities in the Plan of Work had to be placed in a different year due to training schedules.

Key Theme: CREES Communications Program

Connecting Clients through the World Wide Web:

The NMC-CNMI CREES Communications Program was developed in order to meet the growing demand for up to date, easily accessible and relevant information. Agriculturists, Extension Agents, major stakeholders and clients now have access to a world of information at the click of a button. The NMC-CNMI CREES Communications Program developed the following web site http://www.crees.org to help provide and easily disseminate information to the agriculturists, extension agents and our major stakeholders anywhere in the world. This web site focuses on all the programs and projects that the NMC-CNMI CREES have been providing in accordance with the five-year plan of work. Information on Agriculture and Family Sciences can be easily downloaded and/or read off the Internet. Links to major sites such as the Agriculture Development in the American Pacific site, USDA, CSREES, NASULGC, Universities, Sister Colleges and many other resourceful links have provided Agriculturists, Extension Agents and stakeholders to a virtual library full of information. Agriculturists, Extension Agents, clients and stakeholders can now access the web site and download agricultural guidebooks, press releases, nutrition and health information, agricultural opportunities and many more. The NMC-CNMI CREES Communications coordinator is a member of the NMC Web site committee. This committee has an abundance of web masters that provide an abundance of information. Web site Development classes have been provided to fellow NMC-CREES personnel as a form of in house training. Training on the proper methods and ways to access the ADAP Libraries have also been provided for the NMC-CNMI CREES personnel through the communications program.

Dissemination of Information:

In addition to the World Wide Web, the major means of disseminating information throughout the CNMI come from the mediums of press releases, public speaking, workshops, brochures, bulletins, publications, radio and television shows. Since the induction of the official communications program, numerous press releases on all major events that have occurred at NMC-CNMI CREES have been reported throughout the three islands. The CNMI has two main newspaper carriers (Marianas Variety and Saipan Tribune) together these media outlets have over 10,000 readers. With the newspaper being the number one source of information, the

number of participants in the program featured in the press release has increased. The press releases provide information to our clients on important program awareness, events, environmental issues, who, how and where to get a hold of our extension agents and services. In relation to press releases, the communications program is in the process of starting a monthly newsletter to better serve our clients and extension agents. A questionnaire is being designed to evaluate and accurately document the number of program participants that hear or read about our programs through press releases or other media. Many of the NMC-CNMI CREES staff and faculty members help promote their programs and success in local radio talk shows and television interviews.

Community Relations and Expanding Target Markets:

To further address our diverse target market, the communications program coordinator is a member of many highly regarded committees, such as the CNMI-wide liberation day committee, CNMI Labor Day committee and the NMC PROA. The Liberation Day and Labor Day committees have given the communications coordinator a chance to promote NMC-CNMI CREES to other government agencies and keep in close contact with leaders and the general public of the CNMI community. The NMC PROA is the major college newsletter that has over 900 readers and provides access to more publication channels and readers. Small-scale newsletters, bulletins, brochures have been designed in order to provide the general public of all the services that the NMC-CNMI CREES has to offer. Large-scale production of the newsletter bulletins, brochures, and publications are awaiting the arrival of the necessary equipment and proper training. Collaborations with the Northern Marianas College Video and Radio production are on the way to produce top quality and informational shows. Current Video and Radio shows are being conducted in collaboration with partner agencies such as the Commonwealth Utilities Corporation and the Department of Lands and Natural Resources.

In addition, many of our respected scientists and staff members provide extra curricular activities to help promote their programs. For example, Dr. Lee Eavy opens up the Sabalu Market “Bug Doctor Clinic.” In the clinic, farmers learn about the various bugs, weeds, and pests that are destroying local crops. Children and family members frequent the clinic and walk away with loads of useful information.

IMPACTS

World Wide Web:

With the development of the web site, agriculturists, extension agents and major stakeholders now have easier access to most agriculture-related topics and references. In addition, using the World Wide Web as a medium to disseminate information provides a twenty-four hour source of information. Agriculturists, Extension agents, stakeholders and clients can access the web site from anywhere around the world. Since the development of the new and improved web site (http://www.crees.org) the number of hits by Agriculturists, Extension Agents and major stakeholders living in the CNMI are listed at over 500 per month. In addition, 200 hits per month come from fellow stakeholders from Micronesia, parts of Asia, the mainland USA and parts of Europe.

Press Releases:

The access to the many mediums has provided the communications program with an abundance of reading resources and distribution outlets. The press releases have been the most successful way of promoting our programs. Some small-scale brochures, bulletins, newsletters and major publications have been produced but we lack the necessary equipment to produce high quality large-scale media.

Radio/Television Interviews:

Many members of the NMC-CNMI CREES participate in local radio talk shows and Television interviews. Dr. Lee Eavy, head entomologist has been providing local farmers and various listeners with many important tips about insects, our environment and the IPM program. Many of our faculty and staff members have been interviewed about the successes of their programs, and/or to provide general information about their particular programs. These forms of media are essential to the program, because it provide us with free advertising, free air time, and most of all they disseminate information to thousands of people all at the same time.

Sabalu Market “Bug Doctor’s Clinic:

This clinic provides an alternative source for farmers, children and the general public to interact with scientists from the CNMI CREES. This clinic is run on a voluntary basis, therefore no formal impacts are recorded.

SOURCE OF FUNDS:

Hatch and Smith Lever 3(d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme: Enhancing Customer Service/Satisfaction

OVERVIEW

The NMC-CNMI CREES Communications Program is highly customer orientated. Our program is designed to meet every need of the customer/client. The Communications Program has devoted the web site, press releases, and production of brochures; bulletins, publications and other media to better serve our agriculturists, extension agents, clients and stakeholders. Although done in small-scale bulletins, brochures, publications, visual aides, video and audio programs are an excellent source of disseminating information. A questionnaire is being developed as to which, what and how reliable these forms of media would be useful to our clients and how they can be improved.

IMPACT

From the late 1980’s to 1998, extension material produced by the previous Agriculture Department has been a very limited handful. Over a span of nine months, the creation of the NMC-CNMI CREES Communications Program has published over 20 press releases; four brochures; six test editions of a CREES newsletter and a fully interactive web page with helpful guidebooks full of information. The CREES communications program has is in the process of partnering with agencies for training and actual production of radio, television and video programs. Although small in scale, all these forms of media were created to enhance and improve the customer service, access a bigger clientele group, disseminate information and promote the organization.

SOURCE OF FUNDS:

Hatch and Smith Lever (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

Key Theme: Institutional Engagement

OVERVIEW

Through the NMC-CNMI CREES web site, press release and other forms of media, the NMC-CNMI CREES Communications Program promotes interaction and cooperation with other institutions. The NMC-CNMI CREES in cooperation with the University of Guam P.E.O.P.L.E project, the University of Hawaii, and the ADAP program, has provided access to numerous extension materials and an online library service for agriculturists, extension agents, clients and stakeholders. In addition, Eileen Herring, the University of Hawaii Agriculture Librarian, conducted a three-day workshop on the ADAP library system. In fiscal year 2000, the Northern Marianas College expanded its partnership with several 1890 Historically Black Colleges and the NASULGC organization.

IMPACT

Having a wider scope of resource provides many CNMI agriculturists, extension agents, clients and stakeholders with the access to specialized professionals. The partnership with the 1890 historically black colleges provides NMC with contacts, links and information that has not been available in the past. With the increase in resources a more balanced and diverse approach to information is also met. The benefits of these partnerships are 1) both extension agents and clients have access to agricultural and other specialists from each school. 2) Information about each program can easily disseminated by linking to the participating school's web site. 3) Up to date and relevant research and studies can now be publicized to all partnering agencies. With the 3-day workshop provided by the University of Hawaii's Eileen Herring, members of the CREES faculty and staff as well as other participants learned the full insights in to how to access and navigate for information on the ADAP library server. This workshop extended the resources for all our extension agents by providing them with an online library with all the agricultural information that they request.

SOURCE OF FUNDS:

Hatch and Smith Lever (d), State-local matching.

SCOPE OF IMPACT:

Commonwealth Wide.

STAKEHOLDER INPUT PROCESS

CNMI Cooperative Research, Extension, and Education Service utilizes a number of forums, conferences and periodic meetings, with stakeholders, to solicit advice and discuss agricultural research and extension needs and priorities. Periodic meetings attended by CREES staff include the monthly: Tinian Soil and Water Conservation District Meeting; Saipan and Northern Islands Soil and Water Conservation Meeting; Luta (Rota) Soil and Water Conservation District Meeting, and the CNMI Interagency Watershed Committee Meeting. Other less regularly held meetings attended, which provide inputs from stakeholders on research and extension needs, include the General Farmers' Meetings, the Farmers' Association Meetings, the Food and Nutrition Council meetings, and others.

During FY 2000, on the island of Rota, an Agricultural Advisory Committee was established, specifically to provide stakeholder input to our programs. The committee is composed of vegetable, fruit and livestock farmers, businessmen (involved in marketing agricultural products and in supplying inputs), educators, the Director of the Department of Land and Natural Resources a representative from the Soil Conservation Service, an agricultural educator, religious and other leaders. The council meets monthly and provides advise on priority program and staffing requirements, highlights problem areas of immediate concern and provides assistance is forming multi-agency cooperation and agreements on joint activities.

More formal and objective methods of involving stake holders in the process are as follows:

1) Problem identification.
2) Estimation of problem importance
3) Problem diagnosis
4) Assessment of research and extension priorities
5) Program and project planning
6) Program implementation and
7) Program evaluations will be developed, implemented and explained in updates to the 5-year plan of work.

PROGRAM REVIEW PROCESS

CNMI Cooperative Research, Extension, and Education Service (CNMI-CREES) holds formal Merit/Peer reviews of each federally funded research and extension project proposal, prior to submission. Since the number of CNMI-CREES staff members are relatively small, all of the professional level staff members are encouraged to participate in Merit or Peer reviews. Senior employees from the Department of Land and Natural Resources, stakeholders and others are encouraged to also participate in the reviews.

The review process is carried out in two steps. To begin with, a draft of the proposal to be reviewed is e-mailed to all of the CNMI-CREES staff and other participants for suggestions and comments, well before the review meeting. The draft of the proposal is revised, based on the comments and suggestions received. The revised proposal is made available to all of the participants, prior to the merit/peer review meeting.

The second step in the review process is the peer/merit review meeting. All available professional research and extension staff, the Director of CNMI-CREES and any anyone else interested, participates in the review meeting.

During the review we assess:

1) The priory or importance of the proposed project
2) The review of literature
3) The completeness of the proposal
4) The relevance of the proposal
5) The quality and scientific value of the proposed research or extension activities and
6) The opportunities for cooperation with others.

The proposals are revised to incorporate the suggestions given and agreed upon during the merit/peer review meeting. The Director assures that the agreed upon suggestions are made. The proposal is then submitted to the President of the Northern Marianas College for concurrence.

After the concurrence of the President is received, the proposal is then submitted to the appropriate funding agency.