

**PROJECT ON REGIONAL MANAGEMENT OF FRUIT FLIES
IN THE PACIFIC: RAS/97/331 (RMFFP)**

**Funded by: AusAID, UNDP
New Zealand Government**

**Implemented by: FAO
Executed by: SPC**

REPORT

THIRD STEERING COMMITTEE MEETING

**Tanoa International Hotel, Nadi
9 - 10 February 2000**

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INTRODUCTION

The third meeting of the Steering Committee of the Project on Regional Management of Fruit Flies in the Pacific (RAS/97/331) (RMFFP) was held at the Tanoa International Hotel in Nadi, Fiji, on 9-10 February 2000. The Committee comprised two national representatives from each of four sub-regions, together with representatives of the donor agencies (UNDP and AusAID), the Executing Agency (SPC), and the Implementing Agency (FAO). The New Zealand Government was not able to send a representative. Also, a representative from the Republic of Nauru was invited, because of the eradication programme for four fruit fly species, that is being conducted there. A representative from Solomon Islands was also invited, due to the civil disruptions that have adversely affected the project activities there. The Government of Fiji provided a Chairperson for the Meeting (Dr. Ken Cokanasiga, Deputy Permanent Secretary (Operations), Ministry of Agriculture, Fisheries and Forests). Attachment A contains the list of representatives to the meeting.

The purpose of the meeting was to:

- assess the progress of the project activities against objectives;
- advise on the work plan developed in October 1999 and project activities for 2000 and beyond, in order that activities reflect the priorities of the Pacific Island countries and territories (PICTs), donor agencies and regional organizations; and
- collectively solve problems related to the national and regional fruit fly programmes.

Attachment B is the Agenda for the meeting.

This Report summarizes the meeting's deliberations and recommendations and provides guidance to the Project's management on activities for 2000.

DELIBERATIONS AND RECOMMENDATIONS

Agenda Item 1: Opening of Third Steering Committee Meeting

Mr. Tim Casey, Chairperson of the Board of the Nature's Way Cooperative (Fiji) Ltd., which operates the commercial forced hot air unit at the Nadi Airport, opened the meeting. He spoke of the impact of the fruit fly activities on the removal of constraints to export and the value of export commodities such as papaya, eggplant and mango, to the economy of Fiji. He quoted figures that indicated export benefits of over USD6.2 million over the period 1993 to 2002. Eggplant exports in 1998 amounted to 185 tonnes compared to 50 tonnes in the days of using ethylene dibromide (1996). The expectation of exporting 200 tonnes of eggplant is seen as readily achievable.

Future prospects for the export of breadfruit look very promising as well. Large islander populations in countries such as New Zealand, Canada, west coast USA and Australia offer prospective markets for breadfruit treated with forced hot air treated. Combining technologies that have been developed by the RMFFP, in collaboration with the private and government sectors, such as protein bait sprays for the production component of the export chain and non-host status and forced hot air as quarantine treatments, has opened up export market opportunities.

Mr. Casey emphasized the need for a proactive approach by governments to gaining approval for quarantine treatments from overseas quarantine authorities, especially in Australia and USA. Pressure needs to be applied continuously on these countries following considerable effort and funds that has been put into research by the private and government sectors in the PICTs. To protect gains made in accessing overseas markets, governments must maintain the regional network of quarantine surveillance established under the RMFFP and levels of preparedness to cope with the likely outbreaks of major exotic pest fruit fly species such as Asian papaya fruit fly, Oriental fruit fly or melon fly.

Support was given to the concept of levying growers and/or exporters, say 1 cent per kilogram of product that is treated in the forced hot air unit, to partly finance quarantine surveillance and research associated with quarantine treatment development. At present, this levy would amount to about FJD6,000. These funds should be controlled by the private sector to ensure research reflects the needs of the private sector.

Agenda Item 2: Introductory Remarks

The purpose, scope, format of the Steering Committee meeting was outlined – see above in Introduction. Various documents were provided to representatives as background prior to the meeting. These included Report of the Second Steering Committee Meeting, Recommendations of the Mid-Term Review Report, Progress Report for May 1977 – October 1999, Draft Component on Fruit Fly Management – Regional Fruit Fly Project from 2001, Explanatory Notes for Mandatory Budget Revision December 1999, Status of Fruit Fly Activities of RAS/97/331: October 1999, Quarantine Surveillance Status Report for January 2000, Work Plan for October 1999 – December 2000, and draft Pest Advisory Leaflets for New Caledonia, Vanuatu, French Polynesia and Pitcairn Islands, Fiji Islands, Solomon Islands and melon fly.

The issue of the effectiveness of the consultation process between the countries and territories in the four sub-regions and the sub-regional representatives of the Steering Committee was raised. The discussion that followed over the two days of the meeting showed that the process of consultation was not completely successful. The reports and opinions provided by the sub-regional representatives related primarily to their own countries and territories rather than of the sub-region. This was in spite of being asked to consult with other members of their sub-region. In some instances, no responses from member countries and territories were forthcoming though requests for updates of activities and constraints were requested. In other cases (American Samoa, Cook Islands), reports were forwarded directly to the RMFFP. The RMFFP was asked to investigate ways of improving the consultation process (**Recommendation 1**).

Agenda Item 3: Progress, Achievements, Problems and Solutions

Progress and achievements are summarized against objectives and outputs in Attachment C – Progress Report for May 1997 – October 1999. The Work Plan from October 1999 to December 2000 was provided to all representatives for their perusal and comment. Subject to the changes and additions contained in this report, the Work Plan is to be implemented (**Recommendation 2**).

Objective 1: To overcome constraints on production and export of fresh fruits and vegetables in FSM, Solomon Islands and Vanuatu, caused by the presence of damaging fruit flies

The assessment of achievements in Vanuatu showed that, subject to continuing funding support from the Government, the fruit fly programme there is sustainable and is a model to other PICTs, especially in relation to national ownership and progress that has been made. The PAL for Vanuatu should be translated into French (**Recommendation 3**).

Concern was expressed at the prospects of sustainability of full fruit fly programmes in FSM and Solomon Islands for different reasons. In FSM, insufficient staff limits the range of activities that can be performed. Hence, activities in FSM should be reduced to quarantine surveillance in all States, assessment of parasitoid establishment and spread, and maintaining two cages of mango fly for the purpose of rearing parasitoids for distribution (**Recommendation 4**).

In Solomon Islands, because of civil unrest and extremely difficult conditions at Dodo Creek Research Station, it was noted that the project's laboratory activities were transferred to the Malaria Research Centre. Major problems exist in providing adequate, secure personal accommodation for the United Nations Volunteer or the Scientific Officer, whose salary is paid for the RMFFP and whose other entitlements are supposed to be provided by the Ministry of Agriculture and Fisheries. Fruit fly activities have been severely constrained on Guadalcanal by the impact of civil unrest and in other provinces by the inadequate commitment by the Government under the current civil climate. The activities in Solomon Islands should be limited to re-establishing quarantine surveillance in the areas near Bougainville and elsewhere, maintaining laboratory colonies at the Malaria Research Centre, undertaking relevant non-host studies and field control using protein bait sprays, and carrying out heat tolerance studies on the immature stages of *Dacus solomonensis* (**Recommendation 5**).

The importance of maintaining continuing quarantine surveillance in the areas adjacent to Bougainville, PNG, was emphasized. Early warning systems are needed to determine the spread of serious pest species, such as Asian papaya fruit fly (*B. papayae*), from PNG into Solomon Islands and beyond. To facilitate the re-establishment of quarantine surveillance, the Solomon Islands Government should prepare a proposal identifying the essential costs of setting up trapping and limited host surveys, especially in the areas adjacent to Bougainville, and submit it to the RMFFP for possible funding (**Recommendation 6**).

Countries expressed concern at the number of new fruit fly species, particularly in Fiji, Solomon Islands, Vanuatu, Samoa, Tuvalu, and Tokelau, which still were not adequately described taxonomically. Several species were still referred to as '*Bactrocera* new species near.....', such as '*Bactrocera* new species near *paraxanthodes*'. Completion of taxonomic descriptions and prompt publication is urgently needed (**Recommendation 7**). Similarly, the distributions of banana fruit fly (*B. musae*) in Vanuatu, Solomon Islands and the island provinces of PNG need to be confirmed and published (**Recommendation 8**). Undertaking regular host surveys of bananas, plantains, and related species in these countries will help validate its distribution and act as an early warning system if banana fruit fly is not present (**Recommendation 9**).

Objective 2: To improve the quarantine preparedness of PICTs to cope with outbreaks of exotic fruit flies regionally and nationally.

Permanent quarantine surveillance systems, based on trapping with methyl eugenol and Cue-lure and surveys of high-risk fruits, have been established in 21 PICTs as early warning systems for incursion of exotic fruit flies. In Pitcairn Island, fruit fly surveys are done when staff from New Zealand visit, usually once or twice per year. PICT Governments demonstrated commitment to quarantine surveillance. 18 of the 22 PICTs responded to a quarantine surveillance questionnaire sent out in late 1999. This commitment needs to be on a continuing basis (**Recommendation 10**).

A part of this commitment, it is necessary that Governments recognize that outbreaks on some exotic agricultural pests and weeds may be as devastating as natural disasters and be more persistent. It should be a high priority role of SPC, in consultation with Departments of Agriculture, to improve the awareness of Governments to the impact of these exotic threats and to encourage, in the strongest possible terms, the inclusion of disasters caused by agricultural pests into Natural Disaster Plans (**Recommendation 11**). The RMFFP will continue to play its part in promoting public awareness on fruit flies, their management, and quarantine importance (**Recommendation 12**) and to provide advice on eradication programmes regionally, particularly in Nauru, Palau, French Polynesia, Guam and CNMI (**Recommendation 13**). In response to a recommendation of the previous Steering Committee Meeting, the RMFFP has set up in Fiji a stockpile of supplies to initiate emergency responses, including traps, rearing containers for fruit samples and lures.

The Meeting was briefed on the Fruit Fly Eradication Programme (FFERAD) in Nauru. Oriental fruit fly (*Bactrocera dorsalis*) and melon fly (*B. cucurbitae*) have been eradicated and Pacific fruit fly (*B. xanthodes*) and mango fly (*B. frauenfeldi*) are close to eradication. Fresh mango fruit and breadfruit are now available.

A positive flow-on from the FFERAD in Nauru is that, because of the near absence of fruit flies, there is considerable interest in establishing a small tropical and sub-tropical nursery to provide grafted seedlings to the public at a nominal cost. The Departments of Youth and Island Development and Industry are seeking funding from UNDP to commence this venture of training youths and provide fruit-tree seedlings (**Recommendation 14**). Nauru promulgated legislation (Agricultural Quarantine Act) to control the importation of fresh fruits and vegetables that are hosts to fruit flies to prevent the re-introduction of exotic fruit flies into Nauru. Now, support is needed to set up a small Agricultural Quarantine Service and to train three staff in FSM or Fiji (**Recommendation 15**). The Nauru eradication programme provided an ideal opportunity to provide 45 plant protection and quarantine staff from 19 PICTs and SPC with training on eradication techniques.

Though all participants in the FFERAD in Nauru had received information on the costs of components of emergency responses and eradication programmes, representatives at the meeting wanted estimates of the costs of running these types of programmes from the RMFFP. An undertaking was given to provide this information (**Recommendation 16**). Also, information on the commercial availability and cost of Fipronil/xanthane gum formulation for protein bait spray was requested from Rhône Poulenc Rural (Australia) (now called Aventis Crop Science) (**Recommendation 17**).

Objective 3: To enhance production and export of fresh fruits and vegetables regionally in order to increase farmer's incomes and to assist in providing food security.

A major effort has gone into providing information on fruit flies and their importance and management to PICTs. Slide transparencies of economically important species have been distributed to each PICT to assist identification and for training purposes. Pests Advisory Leaflets for fruit flies in New Caledonia (French and English), French Polynesia, Vanuatu, Fiji Islands, Solomon Islands, and melon fly have been completed and are ready for printing. Creation of the contents of a Pacific fruit fly WebSite has resulted in the collation of a large body of information on fruit flies in the region and it is hoped that this will be launched by 30 April 2000 (**Recommendations 18 and 19**).

The Report on "A Socio-economic Evaluation of the Regional Fruit Fly Projects" by Dr Andrew McGregor was summarized and the findings were presented to the meeting. The study compared the internal rate of return (IRR) in the 1996 Report (37%) to the IRR in 1999 (19%). The downward revision of benefits was attributed to higher donor contribution over 1997-1999 than that predicted in the 1996 Report. Also, the estimate of the value of export produce was higher in 1996 than the actual value of export. The 1999 IRR, now based on nine years data, still indicates a high level of economic viability.

The Report shows that the impact of fruit flies on fruit availability and consumption at the village level is probably not significant with the current fruit fly fauna. However, establishment of exotic species with wide host ranges, such as Asian papaya fruit fly or oriental fruit fly, will have a severe impact on fruit production. The real impact of losses caused from fruit flies is felt at the peri-urban and commercial levels, where considerable losses may occur, even with existing fruit fly species. It is in this arena that fruit fly control methods such as bagging and protein bait sprays have most impact. On the issue of export using expensive equipment and facilities for forced hot air quarantine treatment, a warning was issued to investigate markets and the economical feasibility before establishing a quarantine treatment facility (**Recommendation 20**).

As the 1999 Report contains valuable information on production and nutritive value of fruits, as well as information on the economic impact of fruit fly control programmes at various levels of production, it is being professionally edited and printed.

To facilitate the harmonization of quarantine treatments based on forced hot air, representatives at the meeting were keen to share data on thermal tolerances of immature stages and non-host status and quarantine pathways/work plans for commodities (**Recommendation 21**). French Polynesia is interested in setting up forced hot air facilities in Tahiti and wishes to receive hands-on training in New Caledonia or in Fiji (**Recommendation 22**). To facilitate quarantine harmonization and promote wide acceptance of generic treatments using heat or cold and also non-host status as a treatment, it is necessary for the Pacific Plant Protection Organization (PPPO) to take a leading role in the consultation process. Consultation needs to be with importing countries and, if necessary, with the Forum Secretariat and its Trade Commissions. It may be necessary to raise problems with PPPO, ICPM or WTO (**Recommendation 23**).

Retention of staff trained under the RMFFP in many PICTs has been a major problem with sustaining activities at viable levels. Samoa, in particular, requested refresher training for established staff and training for new staff. Staff from American Samoa, Niue and Cook Islands may be included (**Recommendation 18**).

Objective 4: In cooperation with ACIAR, to develop a multi-disciplinary fruit fly programme to address the enormous risk of fruit fly spread through and from PNG into the rest of the region.

The progress of fruit fly activities under the combined PNG Fruit Fly Project is satisfactory – see Attachment C. Both the ACIAR funded project and the RMFFP are collaborating much better now than earlier in the projects. Laboratories at Bubia and Kerevat are now fully operational.

The laboratory at Laloki needs modification and this will be examined during a visit by Luc Leblanc in February. With these laboratories in place, PNG is in a very sound position to establish viable colonies of pest fruit fly species and to commence the generation of thermal tolerance data for a range of pest fruit fly species.

Of high priority is the establishment of the quarantine surveillance in the Bougainville area and the clarification of the geographic distributions of Asian papaya fruit fly and banana fruit fly – see Recommendations 8 and 9. Trapping and host surveys show that Asian papaya fruit fly occurs over the PNG mainland, but does not occur in the island provinces as yet. Banana fruit fly occurs on mainland PNG, but has not been confirmed as occurring in the islands, although there are recent specimens similar to banana fruit fly trapped from East New Britain, including Duke of York Islands (adjacent to New Ireland). Adult flies have been reared from bananas in East New Britain and maggot infestations on bananas have been reported in Bougainville. Examination of specimens by Prof. Richard Drew is required to confirm correct species identity.

Demonstrations of the protein bait spray technique have been carried out with varying degrees of success, at Kerevat (guava), in the Markham Valley (guava and mangoes), and near Laloki (carambola). Plans are in place to expand this work to include control of cucurbit infesting flies and fruit flies infesting chilli and the use of a new bait formulation consisting of Fipronil and xanthane gum with protein autolysate. This new formulation follows work done in Nauru and Queensland by the RMFFP, Griffith University and Aventis CropScience. The protein bait spray technique is being complemented with demonstrations and distribution of an extension PAL on the bagging technique using double-layered newspaper bags or bags made from natural products such as leaves.

One of the tangible successes of the PNG Fruit Fly Project is the use of Junior Scientific Officers (JSOs) to guarantee ownership and sustainability of the project activities and to ensure that any improvement to the technical capacity nationally remains within PNG. The RMFFP has funded three JSOs, one at each of Kerevat, Bubia and Laloki, and these staff have performed very effectively with or without the technical guidance of the Chief Technical Adviser or United Nations Volunteer Entomologist. This has been so successful that the RMFFP has not seen a need to replace the United Nations Volunteer Entomologist, when he left to take up duties with the project in Suva. Also, the National Agricultural Research Institute is planning on implementing a cadetship system using the JSO system as a model.

Objective 5: To ensure sustainable technical capacity for coordination of future activities on fruit flies in the Region.

The positions of Entomologist (Fruit Flies) and the Assistant Entomologist (Fruit Flies) were filled in August and September 1999, by Luc Leblanc and Ema Tora Vueti, respectively. This has given the project a considerable technical boost and has resulted in a vastly improved output, especially in the area of service to specific countries and the generation of information through the production of PALs and the creation of a WebSite.

Under the umbrella of the SPC Plant Protection Service, a new project proposal to take the project to 2004 is being prepared for submission to AusAID and UNDP for cost-shared funding.

No progress has been made in identifying possible candidates for post-graduate studies in biology or plant protection. The main reason for this is that Governments may have difficulty in co-sponsoring candidates.

Objective 6: To promote private sector involvement in sustaining quarantine surveillance and research into fruit fly control and quarantine treatments for commodities destined for export.

Approaches to apply a small levy of 1 cent per kg for all commodities that treated through the forced hot air facility run by Natures Way Cooperative (Fiji) Ltd. received a favourable response. The response was on the basis that the Cooperative has control over the type and timeframe for research, thus ensuring that the research reflects the needs of the private sector. If this approach is successful, then it will be the basis of a model that may be applied to Tonga, Cook Islands, New Caledonia and Samoa.

Agenda Item 4: General Discussion and Summation

The discussion at the end of the first day resulted in the recommendations highlighted above. The major issues addressed included:

- the need to increase the government and public awareness of the social and economic significance of disasters brought about by incursions of exotic pests and diseases and to ensure that such disasters have the same status as natural disasters;
- the sustainability of the project activities in FSM and Solomon Islands;
- problems with the harmonization of market access technologies and the international acceptance of non-host status as a quarantine treatment; and
- national responsibility for taking over funding of quarantine surveillance.

Agenda Item 5: Recommendations from Previous Steering Committee Meeting and Mid-Term Review

All recommendations have been addressed, with some carrying over to this meeting, e.g., the need to take a collective approach to ensure that market access technology is harmonized and accepted by international authorities based on scientific reasons. Access to PEACESAT is no longer an issue because, with the exception of the USA territories, the facilities in many countries are no longer operational and will not be revived. There is still the need to purchase a stock pile of lures for fruit fly emergency responses, but this is more or less in place in that the RMFFP will purchase 20 litres of Cue-lure and 200 litres of methyl eugenol during the first quarter. These will be located at the Koronivia Research Station, Fiji.

The recommendations from the Mid-Term Review held in October 1998 were included in the Work Plan in 1999 and have been actioned.

Agenda Item 6: Inputs from the Sub-Regional Representatives

As mentioned in Agenda Item 2, the inputs from the sub-regional representatives in most cases focussed on problems and needs of their respective countries rather than a consolidated sub-regional approach. The RMFFP had received inputs from PICTs prior to the Steering Committee Meeting and summaries if these are included for completeness. A summary of the needs from each participant is shown below:

SUB-REGIONAL GROUP 1 - PNG, Solomon Islands and Vanuatu

Papua New Guinea - The deficiencies in trapping such as the Bougainville area and the Milne Bay area are being rectified, as is the establishment of laboratory colonies at Bubia and risk assessment surveys in conjunction with ACIAR. The South Pacific Brewery has expressed great interest in converting waste yeast from the brewery into a protein useable for protein bait sprays and as a protein supplement for stockfeed. Major constraints in PNG relate to the size and diversity of the fauna, flora and ecological zones and the magnitude of the fruit fly problem. Operational constraints are caused by lack of transport in some areas and inconsistencies in power supply. Initially the loss of the UNV Entomologist left a sizable technical void, but the JSOs have filled the space and are performing very well. The coordination of fruit fly activities has improved considerably recently.

Solomon Islands - The major constraint is the civil unrest and the deleterious long-term effect that this has on likely government support and commitment to project activities. The Government has highlighted the importance of fruit flies to the economy, but on-the-ground support is very limited, e.g., no housing for the UNV or the Scientific Officer, other than on Dodo Creek Research Station, which is insecure. Under these circumstances, it is understandable that work output is below what is expected under normal conditions.

Vanuatu - In contrast to Solomon Islands, the fruit fly activities are sustainable, with very good support from the private sector and government. Both thermal tolerance and host status studies are due to re-commence in March. Interest in converting waste yeast from the Tusker Brewery has been expressed. A request for assistance to clarify whether or not banana fruit fly occurs in Vanuatu was made. If it does not occur, then export of banana may be possible. Also, other species of fruit fly require taxonomic revision.

SUB-REGIONAL GROUP 2 - **Niue, American Samoa, Pitcairn Island, Samoa, Fiji, Tonga, Tuvalu, Tokelau, Cook Islands.**

American Samoa - A major effort has been made in running effective quarantine surveillance and developing a draft Emergency Response Plan. Staff would like extra training in fruit surveillance techniques and damage assessment.

Samoa - Loss of well trained staff has resulted in a depleted technical capacity in Samoa. There is a need for training of new staff and refresher training for existing staff.

Fiji - There is a need to ensure that the staff member who is completing her Masters Degree in Australia is permanently appointed to the fruit fly work in mid-2000. Completion of the confirmatory testing for papaya for the Australian market is essential for the region.

SUB-REGIONAL GROUP 3 - **FSM, Marshall Islands, Kiribati, CNMI, Guam, Palau, Nauru**

Kiribati - Quarantine surveillance and the Emergency Response Plan are in place and there is keenness to continue these activities. The prospects for eradication of mango fly from Butaritari, using male annihilation and protein bait sprays needs to be investigated.

Marshall Islands - Quarantine surveillance is operating in Marshall Islands under the Plant Protection (Micronesia) project.

Guam and CNMI - A new entomologist has been appointed to the College of Micronesia in CNMI and this will enhance prospects of CNMI and Guam working together to eradicate melon fly from both countries.

Palau - The representative from Palau gave a presentation on the current fruit fly situation in Palau. There are four species of fruit flies present – mango fly, oriental fruit fly (recorded in September 1996), breadfruit fly (*B. umbrosa*) and calophyllum fruit fly (*B. calophylli*). Significant losses have occurred as a result of the establishment of oriental fruit fly. Women have lost a considerable proportion of their secondary income from the sale of 'Cavendish' and 'Maad' bananas, guava, soursop and papaya. The Government has set up a Task Force to expand agriculture production and a Sub-Committee to investigate the eradication of oriental fruit fly and possibly breadfruit fly, using methyl eugenol blocking and protein bait spraying. The RMFFP has completed a technical feasibility study for eradication of oriental fruit fly and breadfruit fly at an estimated cost of USD1.2 million. An economic feasibility study has been arranged for March-April 2000. Three laboratory rooms have been modified in preparation for setting up of laboratory colonies for studies on thermal tolerances of eggs and larvae for mango fly to be done by USDA-ARS in Hilo and the RMFFP under the Memorandum of Understanding that exists between the two research entities. Also, the colonies would allow host status studies on betel nut to be undertaken.

Nauru - The eradication programme has been rated a great success with mangoes undamaged by fruit flies being readily available to people. The interest in expanding fruit production by introducing new varieties of mangoes and other fruits is seen as a direct benefit from the eradication programme and may help food security and quality. There are still improvements to be made, especially the establishment of a small Agricultural Quarantine Service and the training of relevant staff to police the entry of fresh fruits and vegetables.

SUB-REGIONAL GROUP 4 - New Caledonia, French Polynesia, Wallis & Futuna

New Caledonia - More work is needed on damage assessments and there is a need to expand the effort on adoption of bagging and protein bait spray application, although protein bait spraying is used for lime, mango and litchi. Though a forced hot air facility is available, farmers need to be motivated to plant eggplant and capsicum. Work has commenced on using cold treatments.

French Polynesia - The oriental fruit fly eradication programme in Tahiti and Moorea is continuing. Five blocking campaigns were carried out since April 1999. Pacific fruit fly was eradicated from Raivavae during 1999 by using a combination of protein bait spraying and male annihilation with methyl eugenol blocks. French Polynesia requested technical assistance and advice on the oriental fruit fly eradication programme. Progress in eradicating *B. xanthodes* from Raivavae is promising. There is great interest in forced hot air so a request has been made to provide training in New Caledonia or elsewhere.

Wallis & Futuna - Quarantine surveillance has been re-commenced on Wallis.

Agenda Item 7: The Regional Fruit Fly Project from 2001

The Plant Protection Advisor briefed the Meeting on the proposal to set up a Project Management Service within SPC, under which the Fruit Fly Management component will operate. It will operate with other components, such as Taro Beetle Management, Methyl Bromide Alternatives, and Plant Protection (Micronesia). These projects will direct advice to a component on Information and Extension. A project proposal is being drafted and it is expected that it will be ready for submission by the end of February 2000. Funding is being sought from AusAID for all components and from AusAID and UNDP on a cost-shared basis for the Fruit Fly Management component. It is expected that the components will operate for four years.

Agenda Item 8: Remarks by UNDP, SPC, AusAID and FAO

UNDP

The achievements of the RMFFP are impressive and it is a tribute to commitment of the countries and territories and the leadership of the project. Success stories were raised at the recent Mid-Term Review of the UNDP Regional Programme, e.g., the JSO concept, country ownership, linkages and crosscutting, and the Steering Committee. The cost-sharing arrangements between AusAID and UNDP have worked very well and are commended. The project has been able to build up national ownership and technical capacity to take advantage of the spin-off activities from programmes like the Small Grants Scheme in UNDP.

SPC

SPC recognized the valuable contributions of the Steering Committee and the Chief Technical Advisor. The concern of organizations like SPC is that donors in the agriculture sector are saying that more needs to be done with less and that there is a great need for demonstration of sustainability. For this reason, PICTs need to show government often earlier than expected and this applies to the fruit fly activities nationally.

AusAID

Obviously, there is demonstrable increased technical capacity at the national and regional levels. Market access for fresh commodities has been a major step forward. The greatest risk to sustainability is turnover of trained staff and changes in the priorities or focus of governments. There is a need to train trainers and produce training aids such as videos. An issue that needs to be looked at seriously is within-country quarantine restrictions to limit movement of serious, newly introduced pest species.

FAO

The representative conveyed FAO's sincere congratulations to the RMFFP and SPC for the significant achievements of the project. The success of the project demonstrated the value of collaborative activities between regional organizations. FAO will continue to support fruit fly activities through Small Grants Scheme or the Technical Cooperation Project system.

Agenda Item 9: Recommendations

The Steering Committee recommended that:

1. RMFFP investigate the feasibility and costs of running separate meetings for the four sub-regional groups that make up the Steering Committee, combined with less frequent Steering Committee Meetings, in an effort to ensure that there is improved consultation on the fruit fly management needs of each PICT. The sub-regional meetings may have to piggyback on other sub-regional or regional technical meetings.
2. RMFFP implements the Work Plan for 2000, as submitted, with cognizance of the changes recommended below.

3. The Pest Advisory Leaflet on Fruit Flies in Vanuatu is translated into French.
4. The Work Plan for FSM is revised to reduce the activities to quarantine surveillance in all States, assessment of parasitoid establishment, and maintenance of two laboratory cages of mango fly for the purpose of rearing parasitoids.
5. The Work Plan for Solomon Islands be modified to focus on re-establishing quarantine surveillance in the Western Province islands, particularly in those islands adjacent to Bougainville, PNG, maintaining laboratory colonies at the Malaria Research Centre, undertaking relevant non-host studies, and field control using protein bait sprays and carrying out heat tolerance studies on the immature stages of *Dacus solomonensis*.
6. Solomon Island Government submits to SPC a proposal for quarantine surveillance for exotic fruit flies, with particular reference to the areas adjacent to the Solomon Islands-PNG border by 31 March 2000.
7. RMFFP liaises with Prof. Drew of Griffith University, Brisbane, to encourage the completion and prompt publication of the taxonomic descriptions of the species of fruit flies in the Pacific region (particularly in Fiji, Samoa, Tuvalu, Tokelau, Vanuatu and Solomon Islands), whose identities are currently designated as '*Bactrocera* new species near' (e.g., *B. new species near paraxanthodes*).
8. Data on the distribution of banana fruit fly (*B. musae*) in Vanuatu, Solomon Islands and the island provinces of PNG be verified and published as soon as possible.
9. Regular host surveys of ripe banana and plantain fruits be carried out in Vanuatu, Solomon Islands and the island provinces of PNG to substantiate the absence of banana fruit fly from these areas and as part of quarantine surveillance.
10. PICT Governments and Administrations assume the financial responsibility for national quarantine surveillance programmes as of 1 January 2001, with technical support from the RMFFP and other major partners.
11. SPC, in consultation with national Departments of Agriculture, actively promote the raising of the priority of Agricultural Disasters, created by the incursion of exotic fruit flies and other pests, to the same level of importance as that of Natural Disasters and that Agricultural Disasters be incorporated into the national Natural Disaster programmes to ensure adequate funding is available, when required.
12. RMFFP continues to actively provide assistance to PICTs in developing their national and regional public awareness programme related to fruit flies, their management and their importance to fresh fruit and vegetable production and quarantine.

13. RMFFP provides technical advice and support for the current fruit fly eradication programmes in French Polynesia and Nauru and for the possible future programmes in Palau, Guam and Commonwealth of the Northern Mariana Islands (CNMI). The assistance is to include economic feasibility studies for eradication of oriental fruit fly in Palau and melon fly in Guam and CNMI.
14. As a flow-on from the successful Nauru Fruit Fly Eradication Programme, the establishment of a small plant nursery to supply improved varieties of tropical fruit trees to the people of Nauru be strongly supported and that UNDP be approached for funding support.
15. SPC support the setting up on an Agricultural Quarantine Service in Nauru, including the training of three Quarantine Officers funded by the RMFFP.
16. RMFFP prepares a cost estimate for emergency responses and eradication programmes on a per square kilometre basis and provides the costs of, and contacts for, quarantine surveillance supplies to the PICTs by 31 March 2000.
17. RMFFP contacts Rhône Poulenc Rural (Australia) for information on the commercial availability and cost of Fipronil and the Fipronil/Xanthane Gum formulations and actively encourage the registration of these formulations for male annihilation and protein bait sprays for fruit fly management, respectively.
18. RMFFP be responsible for regular technical editing and updating of information to be entered into the Pacific Fruit Fly WebSite, with inputs into the country pages being made by the PICTs.
19. The WebSite be modified to include pages on Success Stories and News Updates and a disclaimer to protect SPC and other contributors.
20. PICTs investigate markets for fresh fruit and vegetables in a range of countries, as well as New Zealand, and that these investigations be done before establishing expensive facilities for forced hot air quarantine treatments.
21. PICTs share the results of research into heat tolerances of immature stages of fruit flies and confirmatory quarantine heat treatments and the development of quarantine pathways or work plans for export of fresh commodities, to enhance the prospects for harmonization of treatment procedures and parameters, wherever possible.
22. In preparation for the possible introduction of forced hot air quarantine treatment technology into French Polynesia, RMFFP facilitates training of staff from French Polynesia in this technology in New Caledonia, subject to the agreement by the New Caledonia Chamber of Agriculture, or in other countries that have this technology, e.g., Cook Islands, Fiji, Tonga.

23. The Secretariat of the Pacific Plant Protection Organization (PPPO) facilitates access to Pacific Rim and other relevant markets for PICT fresh fruit and vegetables based on generic heat treatments and non-host status with authorities in the importing countries concerned. If appropriate, market access negotiations should involve other agencies such as the Forum Secretariat and its Trade Commissions and be addressed by raising the problems in gaining market access in the RPPO, ICPM and WTO forums.
24. Samoa organizes training on fruit fly management for new staff from Samoa and American Samoa and from Niue and Cook Islands with support from the RMFFP, before 31 May 2000. The SPC Plant Protection Service will provide funding for participation from Cook Islands and Niue.
25. PICTs request staff, who have received overseas training on fruit fly management, to pass the newly gained knowledge onto other national staff, in order to improve national technical capacity, to avoid disruption to programmes caused by staff turn-over and to enhance the prospects of sustainability.

Agenda Item 10 : Closing the Steering Committee

The Chair thanked the members of the Steering Committee for the frank and constructive comments on the progress and future plans for the RMFFP. He commented on the significant progress that has been made in the understanding of fruit flies in the region and the impact that pre-harvest and post-harvest management has had on local production and trade.

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RMFFP STEERING COMMITTEE MEETING
Tanoa International Hotel, Nadi : February 9 - 10, 2000.

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**Project on Regional Management of Fruit Flies in the Pacific, SPC.
Steering Committee Meeting
Tanoa International Hotel – Nadi, Fiji : 9 – 10 February, 2000**

AGENDA

Wednesday, 9th February, 2000

1.	Opening of Steering Committee Meeting	<i>Mr. Tim Casey</i>	8.30 – 8.40
2.	Introductory Remarks		8.40 – 8.55
	➤ Purpose and scope and format of meeting		
	➤ History, background and objectives	<i>Allan Allwood</i>	
3.	Progress and Achievements, Problems, Solutions		
	Objective 1 - Extension of fruit fly activities of Phase II in Solomon Islands, Vanuatu and Federated States of Micronesia		
	➤ <i>Achievements and constraints</i>	<i>Allan Allwood</i>	10.00-10.15
	➤ <i>FSM sustainability</i>	<i>Discussion</i>	9.10 – 9.25
	➤ <i>Solomon Islands situation</i>	<i>Discussion</i>	9.25 – 9.45
	<i>Morning Tea</i>		9.45 – 10.00
	Objective 2 - Improvement to quarantine surveillance and preparedness for eradication of exotic fruit flies regionally		
	➤ <i>Achievements and constraints</i>	<i>Allan Allwood</i>	10.00-10.15
	➤ <i>Quarantine surveillance</i>	<i>Luc Leblanc</i>	10.15-10.30
	➤ <i>Emergency Response status</i>	<i>Ema T. Vueti</i>	10.30–10.40
	➤ <i>Nauru Fruit Fly Eradication</i>	<i>A.Allwood/N.Tamakin</i>	10.40-11.00
	Objective 3 - Technology transfer and adoption to increase production and export of fruits regionally, including bait spray technology		
	➤ <i>Achievements and constraints</i>	<i>Allan Allwood</i>	11.00-11.15
	➤ <i>Control technology (bagging, protein baits Waste yeast)</i>	<i>Allan Allwood</i>	11.15-11.30
	➤ <i>Socio-economic report</i>	<i>Dr. A. McGregor</i>	11.30-12.30
	➤ <i>Status of quarantine treatments</i>	<i>Ema T. Vueti</i>	12.30-12.45
	<i>Lunch</i>		12.45 - 2.00
	Website presentation		2.00 - 2.45
	Demonstration of pinned specimens (ongoing)	<i>Luc Leblanc</i>	(Ongoing)
	Objective 4 - Specific multi-disciplinary programme for fruit fly management in PNG		
	➤ <i>Achievements and constraints</i>	<i>Luc Leblanc</i>	2.45 - 3.15
	➤ <i>JSO Concept</i>	<i>Allan Allwood</i>	3.15 - 3.25
	<i>Afternoon Tea</i>		3.25 – 3.45
	Objective 5 - Regional sustainability and coordination of fruit fly management activities		
	➤ <i>Achievements and constraints</i>	<i>Allan Allwood</i>	3.45 – 3.55
	Objective 6 - Private sector involvement in sustaining quarantine surveillance and fruit fly research		3.55 – 4.05
4.	General discussion and summation		4.05 – 5.05

Thursday, 10th February, 2000

Discussions and questions on previous day's activities

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|----|--|--------------------------|---------------------|
| 5. | Recommendations from previous Steering Committee Meeting and Mid Term Review | <i>Allan Allwood</i> | 8.30 – 9.00 |
| 6. | Inputs from Sub-Regional Groups | <i>Sub-Regional reps</i> | 9.00 – 10.00 |
| 7. | The Regional Fruit Fly Project from 2001 | <i>Dr. Mick Lloyd</i> | 10.00-10.15 |
| | <i>Morning Tea</i> | | 10.15– 10.45 |
| 8. | Remarks by UNDP, SPC, AusAID, FAO | | 10.45-11.15 |
| 9. | Recommendations for 2000 | | 11.15-12.30 |
| | <i>Lunch</i> | | 12.30 – 1.30 |

Discussions and questions on morning activities

10. Closing of Steering Committee Meeting

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PROGRESS OF ACTIVITIES FOR RAS/97/331 : May 1997 – October 1999.

Expected Outputs	Actual Outputs
Immediate Objective 1 : To overcome constraints on production and export of fresh fruits and vegetables in FSM, Solomon Islands and Vanuatu caused by the presence of damaging fruit fly species.	
<p>Output 1.1 Valid data on fruit flies and parasitoids in each country, their host ranges, seasonal abundances, and assessment of losses caused.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • Completed status report on fruit flies and quarantine surveillance in Vanuatu in December, 1997. • Revised trapping programmes in Vanuatu and Solomon Islands to quarantine surveillance focus during 1997 and 1998, respectively. • Trapping and host surveys in Solomon Islands not sustained after departure of UNV. To be handed over to Quarantine with some assistance from Non-Government Organization – Solomon Island Development Trust (SIDT). Recommended 30 trap sites, made up of 12 sites in 5 Provinces in Priority 1 and 18 sites in 8 Provinces in Priority 2 sites. • Quarantine surveillance in FSM limited to Pohnpei. Traps being re-established on Chuuk, Yap and Kosrae by SPC. • Accurate information on fruit flies in Vanuatu (14 species) and FSM (1 species) • More work needed in Solomon Islands particularly on host surveys, but already recorded 57 species of which 11 are undescribed species. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Draft Status Report on fruit flies for Solomon Islands completed and Status Report for Vanuatu revised, updated and submitted to New Zealand MAF Regulatory Authority. • Appointed a replacement United Nations Volunteer Entomologist in December, 1998. • Laboratory facilities at Dodo Creek Research Station, Solomon Islands rejuvenated so that activities related to laboratory colonies, trapping, fruit surveys and heat tolerance studies of eggs and larvae can be re-activated. • ACIAR Fruit Fly Project provided representative fruit fly specimens as reference collection to Solomon Islands and Vanuatu. <p>May-October 1999</p> <ul style="list-style-type: none"> • Outputs from Solomon Islands severely disrupted by political and social instability and security problems in Guadalcanal. Limited to restricted trapping and host surveys. • SIDT assisted with assessments of damage caused by fruit flies in Guadalcanal and Western Province. In Guadalcanal, damage from fruit flies resulted in losses to guava (90-100%), snake gourd (100%), kavika (90%), papaya (50%), cucumber (18-50%), rock melon (20-50%), and mango (5-10%). In Western Province, fruit flies caused losses to carambola (60%), breadfruit (62%), snake gourd (56%), papaya (48%), kavika (38%), banana (33%), orange (29%), and guava (26%). • Damage assessments on North Ambrym by the Farm Support Association (FSA) showed that breadfruit suffered 80-100% damage at the ripe-overripe stage and kavika (<i>Syzygium malaccense</i>) 100% damage at all stages from colour break to fully ripe. • Trapping and host survey systems in Vanuatu now maintained almost entirely by Government. • Trapping and host surveys in FSM maintained primarily by the SPC Plant Protection Project in Micronesia, with some help of country co-operators in the States of Kosrae, Chuuk, Pohnpei and Yap.

<p>Output 1.2 Quarantine surveillance systems/early warning systems to record introductions of exotic fruit fly species and emergency response plans to cope with any outbreak of exotic fruit flies</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • Quarantine surveillance systems in place in Vanuatu and in Pohnpei (FSM), based on trapping and host surveys. See Output 1.1 for Solomon Island status. • Procedures for quarantine surveillance documented in Vanuatu – as model for other countries • No action on emergency response plans. (To be done in association with Nauru eradication exercise in late 1998.) • Fruit fly identification workshops in Brisbane (June, 1997) and in Solomon Islands (January, 1998) with ACIAR. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Discussions with Government of Solomon Islands to use Solomon Islands Development Trust (SIDT) personnel to assist with Quarantine Surveillance in the Provinces. SIDT has about 250 Village Demonstration Workers (VDWs) spread over the country. • Funding proposal for expansion to the existing limited quarantine surveillance programme developed by Solomon Islands MAF and RMFFP. To be implemented during second quarter of 1999. • Quarantine surveillance in Vanuatu and Pohnpei (FSM) continuing. Plans to re-establish trapping in Chuuk and Yap included in FSM National Counterpart's work plan for first half of 1999. • Two staff from Solomon Islands and one from each of FSM and Vanuatu received hands-on training by participating in the Nauru Fruit Fly Eradication Programme. Draft emergency response plans to cope with outbreaks of exotic species of fruit flies completed for Solomon Islands, Vanuatu and FSM. <p>May-October 1999</p> <ul style="list-style-type: none"> • Quarantine surveillance, based on trapping, re-established in Western Province of Solomon Islands, particularly focussing on the Shortland Islands, adjacent to Bougainville, PNG and acting as an early warning system against unwanted incursions of Asian papaya fruit fly (<i>B. papayae</i>) from the PNG mainland. • Quarantine surveillance in Kosrae, Yap and Chuuk re-established under the SPC Plant Protection Project (Micronesia) and reporting is now part of overall quarantine effort within each State. Also maintained in Pohnpei State. • Emergency Response Plans in Solomon Islands, Vanuatu and FSM completed. Plan for FSM to be revised. • Use of NGOs such as SIDT in Solomon Islands and FSA in Vanuatu being used to help with trapping and advisory services on fruit fly control in remote islands.
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Output 1.3

Environmentally sound inexpensive, effective field control systems adopted by subsistence and commercial farmers in order to increase production, food security and incomes of farmers.

May 1997-September 1998

- No specific activities on protein bait spray development from brewery waste yeast until research is completed in Tonga or Fiji.
- Consultancy arranged to establish pilot demonstrations of protein bait spraying and bagging at village level in Ambrym in Vanuatu and on protein bait spraying for cucurbits in Western Province of Solomon Islands. Involvement of Solomon Island Development Trust network.
- Assisted with introduction, rearing and release of the parasitoid *Psytalia fletcheri* for melon fly control in Solomon Islands and *Fopius arisanus* and *Diacasmimorpha longicaudata* into Pohnpei and Kosrae respectively for control of mango fruit fly. Low levels of recovery of *P.fletcheri* and *F.arisanus* during 1997.

October 1998-April 1999

- Consultancy (see above) operating with report due late April or early May. Workshops with VDWs from SIDT held in Honiara and Gizo to explain the importance of fruit flies, their control and assessment of damage levels. VDWs undertaking damage assessments in villages to determine the impact of fruit flies on subsistence food security and production.
- As part of the consultancy, pilot studies on damage assessment and control of fruit flies using bagging of fruits with various types of leaves and protein bait spraying set up in two remote villages in Ambrym, Vanuatu and on a commercial guava farm near Port Vila.
- RMFFP staff from Solomon Islands, PNG and Headquarters were involved in the biennial Conference of about 250 VDWs sponsored by SIDT in Honiara in March, 1999, resulting in fruit fly control at the village level being included in the compulsory tasks to be performed by each VDW.
- The parasitoid, *F. arisanus*, has been recovered from many sites in Pohnpei showing that it is well established. Surveys for the parasitoid, *D. longicaudata*, on Kosrae are planned for the next two months.

May-October 1999

- **Protein bait sprays adopted by commercial guava and citrus producer (Des Park) on Efate, Vanuatu resulted in damage reduction of over 90% to less than 7%, making guava production viable. Bait spray technology resulted in first harvest of marketable fruit from farmer's 800 guava trees.**
- **Farmers on Islands such as Futuna, Aniwa and Anatom (formerly Aneityum) are very interested in using protein bait sprays for control of fruit flies in citrus and guava, resulting from demonstration on Efate. Farmers from these islands to be brought to Efate to work on farm above to gain experience in bait spray application.**
- **Villagers on North Ambrym in Vanuatu have tested protein bait sprays and bagging of fruits with paper bags or bags made from leaves as a means of controlling fruit flies and increasing food security. Bagging of fruits is appropriate technology.**
- **Drafting of Pest Advisory Leaflets for fruit flies and their control for Vanuatu and Solomon Islands commenced.**

<p>Output 1.4 Laboratory colonies of economically important fruit fly species for research into non-host status and quarantine treatments</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none">• Maintained colonies of <i>Bactrocera cucurbitae</i> (melon fly), <i>B. frauenfeldi</i> (mango fruit fly), <i>Dacus solomonensis</i> in Solomon Islands, <i>B. trilineola</i>, <i>B. umbrosa</i> and <i>B.sp.near paraxanthodes</i> in Vanuatu. Colonies in Solomon Islands in poor state in August, 1998.• Colonies of mango fruit fly in FSM died; but have been re-established in 1998. <p>October 1998-April 1999</p> <ul style="list-style-type: none">• Colonies of <i>B. frauenfeldi</i>, <i>D. solomonensis</i> and <i>B. cucurbitae</i> rejuvenated in Solomon Islands since the UNV Entomologist arrived. Major emphasis on <i>D. solomonensis</i> rearing techniques and rate of development studies.• Colonies in Vanuatu maintained for heat tolerance testing of immature stages of fruit flies and for host status testing of fruits and vegetables for export. <p>May-October 1999</p> <ul style="list-style-type: none">• Colonies of <i>B. trilineola</i> in Vanuatu and <i>B. frauenfeldi</i>, <i>D. solomonensis</i> in Solomon Islands, and <i>B. frauenfeldi</i> in FSM have been maintained for heat tolerance research to develop quarantine treatments based on forced hot air.• Studies on rearing techniques for <i>D. solomonensis</i> were disrupted during June-September and are being continued.
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Output 1.5

Increased technical capacity of national staff to be able to identify fruit fly species and develop quarantine treatment based on non-host status and heat.

May 1997-September 1998

- Training workshops in Brisbane (June, 1997) by RMFFP and ACIAR and in Solomon Islands (January, 1998) by ACIAR.
- Contact with ACIAR project for in-country hands-on training in Vanuatu in October, 1997 and January, 1998.
- Host status reports on pineapple, squash and cucumbers completed in Vanuatu and submitted to NZ. Squash and cucumber data accepted at this stage.
- Host status tests on limes, lemons, pineapples completed in Solomon Islands.
- Heat tolerance testing for *B. trilineola* in Vanuatu underway and *B. frauenfeldi* in Solomon Islands commenced but postponed until new UNV arrives.
- Discussions on a small forced hot air unit for testing 300-500kg of produce in Vanuatu in progress. Useful for small countries. To be private sector operated.
- Conducted Workshop on Quarantine Treatment Development in Pohnpei (FSM) for representatives from FSM, Palau, Marshall Islands, and Guam in conjunction with SPC Plant Protection Project in Micronesia and College of Micronesia in May, 1998.

October 1998-April 1999

- Equipment used to undertake heat tolerance studies of immature stages of fruit flies in Vanuatu repaired and is now ready for continuation of heat tolerance testing.
- Host status testing of chillies in Vanuatu shows that chillies are not a host for fruit flies. Data assessed by RMFFP and report to be completed by Vanuatu staff and sent to New Zealand.

May-October 1999

- **Conducted a Workshop on the Generation of Heat Tolerance Data for Immature Stages of Fruit Flies in Port Vila for three participants from PNG, two from Solomon Islands, two from Vanuatu and one from the ACIAR Fruit Fly Project in PNG on 31 October-5 November. Aim was to standardize techniques.**
- **Equipment for carrying out heat tolerance testing of immature stages of fruit flies provided to PNG, Solomon Islands and Vanuatu after Workshop.**
- **Vanuatu completed reports on Non-Host Status of cucumbers, chilli, squash and pineapple, none of which are susceptible to fruit fly attack and may be exported to New Zealand without quarantine treatment.**

<p>Immediate Objective 2: To improve substantially the quarantine preparedness of PICTs to cope with inevitable outbreaks of exotic fruit flies regionally.</p>	
<p>Output 2.1 Quarantine surveillance/early warning systems in all PICTs.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • Quarantine surveillance maintained wholly by Governments in New Caledonia, French Polynesia, Guam, CNMI, Fiji, Tonga, Cook Islands. • Quarantine surveillance established and partly maintained by RMFFP in Samoa, FSM, Vanuatu, Solomon Islands. • New surveillance systems established in PNG, Niue, Nauru under RMFFP (ACIAR Project and NAQS also in PNG). • Quarantine surveillance kits comprising trapping materials, host survey supplies and instruction booklet distributed to American Samoa, Tuvalu, Tokelau, Wallis and Futuna, Palau, Kiribati, Marshall Islands and to FSM for Chuuk, Yap, Kosrae. Completed in July, 1998. • Trapping on Pitcairn Island done – <i>B. tryoni</i>, <i>B. setinervis</i> recorded. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Quarantine surveillance systems are now in place in American Samoa, Palau, Tokelau, Tuvalu, Wallis and Futuna, and Marshall Islands. Specimens have been received from American Samoa, Palau and Tuvalu. <p>May-October 1999</p> <ul style="list-style-type: none"> • Quarantine surveillance, based on permanent trapping systems, operational in all 22 Pacific Island countries and territories (PICTs) – American Samoa, Cook Islands, Commonwealth of the Northern Mariana Islands, FSM, Fiji Islands, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Palau, PNG, Pitcairn Island, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Futuna. Intent is to have a national and regional early warning system for exotic fruit flies to protect fruit and vegetable production. • To update status of quarantine surveillance in each country, questionnaire circulated to each PICT in October 1999. • Collections of representative fruit fly species throughout the Pacific being compiled by RMFFP for distribution to each PICT as reference collections.

<p>Output 2.2 Emergency Response Plans and eradication strategies to cope with outbreaks of exotic fruit fly species, in conjunction with disaster relief groups.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • Emergency Response Plans (ERP) for exotic fruit flies in draft form in Cook Islands, Fiji, Tonga, FSM, Niue, American Samoa, French Polynesia, New Caledonia, Vanuatu as a result of Cairns Workshop in 1996. • Plans for national staff from each PICT that is involved in Nauru eradication programme to complete ERP for their country while in Nauru. • Appointed Entomologist (Fruit Flies) in Project to assist with formulation of country ERPs. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Including PNG, Vanuatu, Solomon Islands and FSM, 23 plant protection and quarantine staff from 17 countries and territories (American Samoa, Cook Islands, FSM, Fiji, Guam, Kiribati, New Caledonia, Niue, Palau, PNG, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Futuna) have received hands-on training on fruit fly identification, the quarantine importance of fruit flies, control and eradication techniques while in Nauru for the four Fruit Fly Eradication Campaigns. As well, over 40 staff on Nauru have been trained. • Eleven countries have developed/upgraded their emergency response plans for exotic fruit flies. <p>May-October 1999</p> <ul style="list-style-type: none"> • Including FSM, Solomon Islands, Vanuatu and PNG, 35 Plant Protection/Quarantine staff from 19 PICTs have received hands-on training in fruit fly eradication techniques, control methods, trapping and host surveys, and developing emergency response plans to cope with the incursion of exotic fruit flies as part of the Nauru Fruit Fly Eradication Programme (FFERAD). • By 7 December 1999, an additional three staff from PNG, one from Solomon Islands and two from SPC will receive training through the FFERAD in Nauru. • A group of six youth workers trained in protein bait spray application technology under the FFERAD and are responsible for the treatment of 'hot spots' in Nauru.
<p>Output 2.3 Readily available stockpiles of traps, attractants, protein autolysate, plastic containers and insecticides necessary to commence on eradication effort quickly.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • RMFFP purchased traps; lures purchased as part of Nauru eradication campaign. To be stored in Fiji with SPC. • Initial discussions with New Zealand MAF Quality Management and Regulatory Authority to access these stocks – MOU to be developed. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • With the assistance of the Crawford Fund for International Agricultural Research and the private sector in Australia, RMFFP has identified small amounts of protein autolysate, methyl eugenol, Cue-lure, and insecticide that may be left over from the Nauru Fruit Fly Eradication Programme. This may be used in emergency outbreaks of fruit flies on a replacement basis. Excess chemicals will be stored at SPC, in Suva in the long-term. • Stocks of plastic containers, traps, paper bags and other supplies have been purchased and are being stored at the MAFF Koronivia Research Station in Fiji. <p>May-October 1999</p> <ul style="list-style-type: none"> • No further activities - see above.

Output 2.4

Effective, high profile regional and national public awareness programmes using videos, television, radio, posters at ports of entry and other media.

May 1997-September 1998

- Drafts of Pest Advisory Leaflets (PALs) on Queensland fruit fly (*B. tryoni*), *B. facialis*, *B. passiflorae* and melon fly completed.
- Drafting of PALs on *dorsalis* complex, protein bait spraying and bagging of fruit in progress.
- Decision taken to produce PALs on fruit flies and their control on a country basis rather than a species basis. To avoid duplication of information and recommendations on control. To be completed by December, 1998.
- Manuals on fruit flies completed for Vanuatu (RMFFP) and Solomon Islands (RMFFP and ACIAR). 200 copies produced in Solomon Islands.
- Discussions with UNDP and AQIS to set up Webpage for RMFFP and fruit flies in the Pacific commenced.
- High quality photographs of fruit flies and damage for PALs, posters and brochures for public awareness now available.
- Negotiations with SPC Media Centre on production of video on fruit flies, their quarantine and economic importance and control commenced. Video by July, 1999.
- Purchase of posters on Australian fruit flies and exotics for distribution to PICTs.

October 1998-April 1999

- Sets of 15 transparency slides of 13 fruit fly species have been duplicated so all PICTs, the ACIAR Project and the SPC Library will each receive one set for reference.
- Five Newsletters on the Nauru Fruit Fly Eradication Programme produced and circulated to make the travelling public of the dangers of moving fruit around the Pacific and to keep the public and Government informed of progress.

May-October, 1999

- **Format for computerized information system on fruit flies in the Pacific developed. Format to match GPPIS and other systems in Australia and New Zealand.**
- **Commenced developing WebPage on fruit flies in the Pacific. It will use data from information system above.**
- **Plan to draft Pest Advisory Leaflets on fruit flies for New Caledonia, Solomon Islands, Fiji Islands, Vanuatu, French Polynesia, Samoa, Tonga, quarantine risks of fruit flies, protein bait spraying, the *dorsalis* complex of fruit flies, Queensland fruit fly, and melon fly and other cucurbit infesting flies. To be completed by 30 April 2000.**

<p>Output 2.5 Improved technical capacity to identify exotic fruit fly species at a national and regional level and to undertake eradication procedures if an outbreak of an exotic species of fruit fly occurs.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • See Output 1.5 and 2.2. • Eradication programme for at least melon fly and Oriental fruit fly in Nauru and on training of national staff in eradication techniques to commence in mid-October, 1998. • Conducted Regional Symposium on Eradication of Oriental Fruit Fly in Tahiti and Moorea in Papeete on 24-27 November, 1997 - 14 countries involved. • Provided advice to French Polynesia on eradication of Oriental fruit fly. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Preparations are in place to assess the feasibility of eradication of Oriental fruit fly from Palau. A visit to Palau is planned for mid-May, 1999. • Continued inputs to the Nauru Fruit Fly Eradication Programme and the training associated with it. Four campaigns of blocking with male lures plus Fipronil have been conducted – October, December, January-February, and late March, 1999. In the first two campaigns methyl eugenol plus Fipronil was used on the fibreboard block. In January-February and March, Cue-lure and methyl eugenol in a ratio of 2:1 was used. • Results of the eradication programme using male annihilation look promising, e.g., Oriental fruit fly has not been trapped for 13 weeks or recovered from fruit samples for 17 weeks; mango fruit fly trap numbers have decreased to about 5 flies per trap per week from 1,000-6,000 per trap per week; children and people in Nauru have been able to eat ripe mangoes, undamaged by fruit flies since early December. • The Nauru Government has drafted an Agricultural Quarantine Bill which is before Parliament and are seriously considering the establishment of a small Plant Protection and Agricultural Quarantine Service to police the legislation. • For details regarding training on eradication techniques provided to national plant protection and quarantine staff and the development of emergency response plans – see Output 2.2. <p>May-October 1999</p> <ul style="list-style-type: none"> • Agricultural Quarantine Bill passed by the Nauru Parliament, allowing restrictions to be placed on the importation of fresh fruits and vegetables and other agricultural commodities. • Neither Oriental fruit fly nor melon fly recorded in traps or in fruits since January 1999. Nauru to be declared free from these species by 1 December 1999. • Pacific fruit fly (<i>B. xanthodes</i>) in extremely low numbers and eradication in early 2000 is predicted. • Mango fly numbers reduced significantly. FFERAD for this species continuing. • Completed a Feasibility Study on the Prospects of Eradication of Oriental Fruit Fly and Breadfruit Fly in Palau for the Government of Palau between June-September 1999. Estimated costs about USD1.2 million. • Participated in discussions with the Governments of Guam and Northern Mariana Islands on prospects for eradication of melon fly from these countries. Visit to Vienna to International Atomic Energy Agency to encourage its involvement in the Sterile Insect Technique needed in this programme.
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Output 2.6

An upgraded, expanded database on fruit fly species in the PICTs, their host ranges, parasitoids, seasonal abundances and levels of damage caused by fruit flies.

May 1997-September 1998

- Negotiated with Queensland Department of Primary Industries for release of database for Fiji, Tonga, Samoa, Cook Islands, Vanuatu, Solomon Islands, FSM.
- Memorandum of Understanding between RMFFP (Pacific Community) and Griffith University regarding database on fruit flies being discussed.
- Vanuatu, Fiji, Solomon Islands, Tonga, Samoa, Cook Islands, FSM and PNG using EXCEL spreadsheet for recording data nationally.
- Status report on fruit flies completed for Vanuatu and FSM, in draft form for Solomon Islands, and being compiled in Fiji, Tonga, Samoa, Cook Islands. Status reports to be used as basis for quarantine negotiations.

October 1998-April 1999

- Production of status reports on fruit flies for Cook Islands, Fiji, Tonga, Samoa and Solomon Islands continuing.
- Negotiations on editorial role on fruit flies for the Global Pests and Plant Information System (GPPIS) with FAO, Rome underway with the view of adding a substantial amount of the data on Pacific fruit flies to the GPPIS.

May-October 1999

- See Output 2.4 for progress.

<p>Immediate Objective 3: To enhance production and export of fresh fruits and vegetables regionally in order to increase farmers' incomes and to assist in providing food security, particularly in those countries not included in the previous fruit fly project.</p>	
<p>Output 3.1 An assessment of effects of transfer and adoption of fruit fly control in sustaining livelihoods in PICTs.</p>	<p>May 1997-September 10</p> <ul style="list-style-type: none"> • Consultancy to carry out study on the value of fresh fruit and vegetable production at the subsistence level and the impact of increases in fruit and vegetable production on poverty and the rural labour market, commenced in September, 1998. • Identified sample countries for consultancy - Vanuatu, Solomon Islands, Fiji, Tuvalu, Samoa. • Pest Advisory Leaflets production – See Output 2.4 • No PEACESAT 'FLYNET' sessions run in early 1998 due to difficulties in access to sites. Recommended in April, 1998, but limited number of countries. • Need to identify an alternative method of communications, apart from email. Maybe tele-conferencing or new satellite system. • Proceedings of the Symposium on Regional Management of Fruit Flies in the Pacific released 52 papers; 22 of which were written by national staff. Released in October, 1997. Already out of print. ACIAR to do another run. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Consultant for above consultancy currently compiling report on data on levels of damage caused by fruit flies and benefits of fruit fly control technology to subsistence fruit and vegetable production, collected in Solomon Islands, Vanuatu, Fiji and Nauru. • Linkages with Non-Government Organizations, e.g., SIDT, improved to foster adoption of control techniques for fruit flies. <p>May-October 1999</p> <ul style="list-style-type: none"> • Comprehensive report from above consultancy by Dr Andrew McGregor in final stages and to be completed by end of November 1999. • Planning commenced for International Symposium on the Management of Fruit Flies in February 2001. • Extension activities with NGO groups in Vanuatu and Fiji result in adoption of protein bait spraying at the commercial level and bagging of fruits at the village level, respectively. Similar response to control techniques in Palau as a result of conducting two seminars on management of fruit flies for up to 25 people from a wide range of backgrounds.

<p>Output 3.2 Transfer of technology related to fruit flies and methods of trapping, host surveys, laboratory rearing of flies and parasitoids, host status testing, heat tolerance testing of immature stages and field control.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • One field demonstration of protein bait spray technique in Fiji (Sigatoka Valley) in July, 1997. • Modification of waste yeast for protein baiting based on Tongan procedure continued in Fiji. Tests on guava to be done in March-April. • Field testing of Royal Tongalure on capsicum in Tonga gave excellent results - commercially released in March, 1998. • Discussions on generic heat treatments held with NZ MAF Regulatory Authority – concept accepted. • Forced hot air treatments for papaya, fresh and pickling mangoes, eggplant for Fiji. Breadfruit tested in February, 1998 and is likely to be cleared. • Heat tolerance data from Tonga and Samoa (done by NZ Hort+Research) accepted by NZ. • Cook Islands obtained clearance for heat treatment of mangoes under generic concept. • Hot forced air facility in Tonga certified for export of papaya to New Zealand. Facility established in New Caledonia by Government and private sector. • Vanuatu has clearance to export squash and cucumbers under non-host status. Need to document quarantine pathway. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Prospects of exporting Royal Tongalure for fruit fly control to Fiji and Niue being investigated. • Confirmatory tests of quarantine treatment for breadfruit in Fiji completed in March, 1999. Quarantine pathway for export to New Zealand being considered. • CTA undertook an audit on the forced hot air treatment and associated quarantine pathways on behalf of the Nature's Way Co-operative (Fiji) Ltd., in conjunction with MAFF, Fiji, and presented report to a meeting of the two groups in February, 1999. Findings being implemented. • In Fiji, quarantine treatment using forced hot air developed for breadfruit to New Zealand. • Value of Fiji exports of papaya, mango and eggplant to New Zealand now worth FJD2.15 million in 1996-98. • Tonga's squash exports to Japan worth TOP6.3 million and Cook Island's papaya exports to New Zealand valued at NZD250,000 in 1998. • Confirmatory tests for forced hot air treatment of papaya into Australia completed and data submitted to Australian regulatory authority for technical assessment.
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<p>Output 3.3 Reduced losses caused by fruit flies at subsistence and commercial levels of production due to adoption of protein bait spraying regionally.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> Recommended bait spray trial at village level in Niue to test the effectiveness of destruction of fallen fruits and protein bait spraying – To be done in second half of 1998 due to shortage of fruits caused by drought. Completed testing of Royal Tongalure on capsicums in 1997. Untreated plots 97-100% damage treated plots less than 10% damage. Royal Tongalure released commercially. As part of consultancy in Output 3.1, field pilot studies on protein bait spraying in Solomon Islands and Vanuatu and on bagging techniques in Solomon Islands, Vanuatu and Fiji planned to commence in September, 1998. Focus is to test level of adoption of technology and estimate increases in production of various fruits. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> Trial in Niue did not show anticipated results and is to be repeated once the report on the demonstration trial is received from the Niue Government and assessed by the CTA. Emphasis has been placed on recommending and actively encouraging, through demonstration, the bagging technique for fruit fly control, particularly at the subsistence level of production in FSM, Vanuatu, Solomon Islands, Fiji, Niue, American Samoa and Samoa. Staff from 17 countries received training in protein bait spray and bagging techniques for fruit fly control during the Nauru Fruit Fly Eradication Programme, with the view of encouraging adoption of techniques on return to their respective countries. <p>May-October 1999</p> <ul style="list-style-type: none"> 35 staff from 19 PICTs now have received hands-on training in protein bait spraying and bagging of fruits for fruit fly control during the Nauru FFERAD.
<p>Output 3.4 An inexpensive, locally available protein manufactured by national breweries or other private companies from brewery waste in Fiji, Samoa, Vanuatu, Solomon Islands and PNG.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> Work completed in Tonga and product to be released in March, 1998. Research on conversion of waste yeast from Fiji Bitter Brewery continuing. In interim, Fiji growers and exporters want to import Tongalure for fruit fly control in export crops because of price advantage. Vanuatu Brewery interested in process. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> No new work has been done on this area of bait spray development between October, 1998 and April, 1999. Testing of a formulation of Fipronil as an insecticide to replace malathion for protein bait spraying commenced as part of the Nauru Fruit Fly Eradication Programme. This is being done with the Crawford Fund for International Agricultural Research and Rhône Poulenc (Rural) Australia. The formulation involves a thickener to improve the adherence of the bait to leaves particularly during wet weather and also to improve the effectiveness of the bait. <p>May-October 1999</p> <ul style="list-style-type: none"> Testing of the new insecticide Fipronil as the toxicant in protein baits and the male annihilation technique in Nauru and Australia has proven very successful. The new formulation for protein bait sprays includes a xanthane gum that results in a very thick bait that adheres to leaf surfaces even under very heavy rainfall. Plans in place with farmers to test the new formulation in Vanuatu, Fiji, and PNG. The Tusker Brewery in Vanuatu agreed to modify waste yeast to protein bait for controlling fruit flies (similar to that in Tonga), as an protein additive to animal feed and so as to reduce environmental pollution by discharging about 800 litres of waste yeast into the ocean.

Output 3.5

Regional database on the heat tolerance of fruit fly species with the aim of formulating generic heat treatments to cope with a range of fruit fly species and commodities.

May 1997-September 1998

- No formal activities on establishing database, except for preliminary discussions with NZ and USDA-ARS, Hawaii on a MOU.
- Concept of generic or recipe heat treatments accepted by NZ MAF Regulatory Authority.

October 1998-April 1999

- MOU on information exchange and collaborative work on fruit flies with the USDA-Agricultural Research Service Laboratories in Hilo, Hawaii negotiated. Heat tolerance database is only one of a number of issues for discussion. Others include technical advice and new techniques for eradication of Oriental fruit fly in Palau, alternatives to malathion as the toxicant in protein bait sprays, and 'generic' or recipe quarantine treatments for fresh fruits and vegetables.

May-October 1999

- **Workshop on Generation of Heat Tolerance Data of Immature Stages of Fruit Flies in Vanuatu promoted the harmonization of procedures for this activity, with the view of setting up more generic quarantine heat treatments across the Pacific.**

<p>Immediate Objective 4: In cooperation with ACIAR, to develop a separate multi-disciplinary fruit fly programme to address the enormous risk of fruit fly spread through and from PNG into the rest of the region.</p>	
<p>Output 4.1 Increased knowledge of the species of fruit flies and their parasitoids in PNG, particularly adjacent to the Irian Jaya border, and of quarantine risks of these species to the rest of the PICTs.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • Established quarantine surveillance in the East New Britain area, by basing a UNV Entomologist there and setting up trapping and host surveys. • Trapping systems established in Buka, Manus Island, New Ireland, Lihir, East and West New Britain, Lae, Bulolo and Wau. • Supplied traps to the Post Moresby area in support of the NAQS Programme. • Provided two staff with training on fruit fly identification in Brisbane. See Output 1.5. • Conducted with ACIAR, an Implementation Workshop on Fruit Fly Projects in PNG in August, 1997 and a Planning Workshop on 15-16 June, 1998. • Recruited and funded two national Junior Scientific Officers with DAL (later with NARI) to be located initially at LAES for training and then to be located at Bubia, Lae and LAES, Kerevat. Third JSO to be recruited for Laloki by December, 1998. • Publication of a practical guide for fruit fly surveying in PNG released. • Produced newsletter 'Infofly PNG' for wide distribution to government and private sector every two months. • Produced audiotape on fruit flies, their importance and control in pidgin for radio stations in PNG. • Translated Pest Advisory Leaflet on mango fruit fly into Pidgin. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • 83 pairs of Cue-lure and methyl eugenol traps have now been set up in eleven Provinces by combined efforts of RMFFP and ACIAR Project. These have been serviced every two weeks and flies submitted to Prof. Dick Drew, Griffith University, Brisbane for identification and data input to a Microsoft Access database. • Identifications provided by the ACIAR Project showed that, up to December, 1998, 95 species of fruit flies were recorded – 68 species were known and 27 species were new to science (two species belonging to the genus <i>Dacus</i> and 25 belonging to the genus <i>Bactrocera</i>) (Clarke, A. R. and Drew, R. A. I. Six Monthly Report to ACIAR on Project CS2/96/225 : 1 July – 31 December, 1998). • Survey of coffee growing areas in Highlands, establishment of trapping sites and identifying occurrence of Asian papaya fruit fly (<i>B. papayae</i>) with NARI staff. • Funds were provided to NARI in October, 1998 for the recruitment of a third Junior Scientific Officer. This person is being recruited for the Laloki laboratory and activities. • Production of the 'Infofly' Newsletter continued and a short video was produced on fruit flies and various control methods appropriate to PNG. • Plans are in place to plug a hole in quarantine surveillance by establishing traps on Bougainville in late April-early May, 1999. To be done as part of UNDP Programme of rehabilitation.

<p>Output 4.1 (Continuation)</p>	<p>May-October 1999</p> <ul style="list-style-type: none"> • 140 permanent trapping sites established in 14 Provinces, each site consisting of two traps, one with cue-lure and one with methyl eugenol. • Snapshot surveys of fruit flies done in West New Britain, New Ireland, Lihir, Manus, Madang, East Sepik, West Sepik and the Highlands. • National staff able to identify a large proportion of trapped and reared fruit fly specimens. Despite this, fly specimens sent to Griffith University for identification and input into Access Database. • 99 of the 180 described species of fruit flies in PNG collected in trapping programme. • Distributions of species now better known than at start of programme in 1997, e.g., Asian papaya fruit fly is present in mainland PNG but not in the Island Provinces and melon fly is widespread, but does not occur in Manus. • Collections of 2,443 samples of edible and wild fruits resulted in 34.2% of samples yielding flies. 14-15 pest species were reared from commercial/edible fruits. • Three parasitoids (<i>Fopius deeralensis</i>, <i>Psytalia fijiensis</i>, <i>Diacasmimorpha kraussi</i>) recorded from fruit flies in East New Britain. • Large reference collections of pinned fruit flies specimens established at Kerevat (3,975 pinned specimens comprising 55 species), Bubia and Laloki. • Trapping and host survey data recorded on EXCEL spreadsheets at each laboratory.
<p>Output 4.2 Dedicated facilities for undertaking fruit fly research at Bubia Research Station (Lae), Keravat (New Britain) and at Laloki (Port Moresby)</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> • Buildings at Keravat (Lowland Agricultural Experiment Station (LAES)) and Bubia modified as fruit fly laboratories. • Buildings at Laloki assessed by the UNV for renovations and modifications. Modifications to be completed by 30 November, 1998. • Supplies (traps, lures, plastic containers, rearing materials) and equipment (computers, refrigerators, cameras) provided to laboratories. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> • Modifications at the Laloki laboratory have not been completed because the RMFFP is still waiting for a quotation for renovations. • At LAES, Cocoa and Coconut Research Institute finally vacated two office/laboratory areas that are being modified into a new rearing laboratory and general laboratory and office for fruit fly work. This will allow work on the development of heat tolerance data on immature stages. • The laboratory at Bubia is to be officially opened at an Open Day that will be jointly sponsored by the RMFFP, ACIAR Project, NARI and the PNG Government on 22 April, 1999. <p>May-October 1999</p> <ul style="list-style-type: none"> • Laboratory at Bubia not officially opened because of dispute between NARI and DAL. The laboratory is fully operational, however. • Laboratory at Kerevat has been slow to reach full operations, due to power inadequacies and lack of air-conditioning in the critical fruit fly rearing room. • Laboratory at Laloki has not been modified due to security problems and the requirement for fencing the property to improve security. There seems to be a reluctance to fence the property despite offers by the ACIAR Project to fund it. This laboratory has been broken into by 'rascals' twice recently, with considerable losses of equipment.

Output 4.3

Reduced losses caused by fruit flies by adoption of a whole system approach for the control of fruit flies, including protein bait spraying, bagging of fruits and cultural and biological control methods.

May 1997-September 1998

- Assessments of damage levels to fruits and vegetables done at LAES area. 2112 fruits, representing 10 commercial fruit species have been collected.
- Levels of damage to guava (78%), cashew apples (66%), pumpkin (50%), yellow mangosteen (18%) and carambola (13%) assessed.
- Field demonstrations on bagging of fruit and protein bait spraying commenced at prison at Kerevat on guavas. Initial results look very promising.

October 1998-April 1999

- Initial demonstration of bagging of fruits and protein bait spraying at the prison (Correctional Institution Service) at Kerevat was abandoned due to security problems there. A new demonstration has been established at the prison and it is proposed to use this demonstration as the basis for a video on fruit flies and their control as well as working with prisoners. UNDP and the RMFFP will co-operate on this activity.
- Plots of carambola in the Laloki area and guava in the Bubia area have been identified for further demonstration/experimental work on protein bait spraying and bagging. Fruit sampling in both areas have given base-line levels of damage by fruit flies, mainly *B. frauenfeldi*. The RMFFP supplied Mauri Pinnacle Protein Insect Lure from Australia for the demonstrations.
- A pest advisory leaflet on bagging of fruits has been drafted in English and Pidgin by UNV and the Junior Scientific Officer at Kerevat.

May-October 1999

- **Protein bait spray demonstration trials carried out at the Kerevat Prison on guava, in the Markham Valley on guava and mango and at Laloki on carambola. Control in carambola resulted in reductions of damage from 100% to less than 10%. Results in the trials at Kerevat and Markham Valley were less spectacular, but still showed marked reductions in damage levels. Heavy rainfall hampered achieving acceptable control. The new formulation of protein bait spray will overcome this problem.**
- **Bagging techniques were tested at the Kerevat Prison and in the Markham Valley. At the Prison, only 2 out of the 152 bagged fruits were infested with fruit flies. In the Markham Valley, the level of damage of bagged guava was 8.4% compared to that of unbagged fruits of 71% damage.**
- **Combination of protein bait spraying and bagging of guavas at the Kerevat Prison allows the sale of guavas for 40-50 Toeas per fruit – a good income for the Prison.**
- **Regular demonstrations of bagging and protein bait spraying to schools, farm visits and open days held at the research stations. Prison inmates and officers trained in the technologies.**

<p>Output 4.4 Improved technical capacity to develop data on heat tolerances of economically important species of fruit flies and to undertake host status testing of particular commodities not regarded as hosts to fruit flies.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> Laboratory colonies of <i>B. decipiens</i> and <i>B. frauenfeldi</i> established at LAES. No other activities at this stage. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> Equipment and supplies for undertaking heat tolerance research on immature stages of fruit flies ordered from Biolab Supplies in New Zealand – should arrive in Fiji for transshipment by mid-April, 1999. Colonies of <i>B. frauenfeldi</i> and later <i>B. papayae</i> set up at Bubia. <p>May-October 1999</p> <ul style="list-style-type: none"> Colonies of <i>B. frauenfeldi</i> at Kerevat, <i>B. cucurbitae</i> and <i>B. papayae</i> at Bubia, and <i>B. musae</i> and <i>B. cucurbitae</i> at Laloki established in the laboratories. Equipment to undertake heat tolerance studies supplied to each laboratory after the Workshop held in Vanuatu. Three Junior Scientific Officers from PNG attended the Workshop on Generation of Heat Tolerance Data for Immature Stages of Fruit Flies in Vanuatu in October-November 1999.
<p>Output 4.5 National staff trained in fruit fly identifications and pre and post-harvest control strategies.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> Two of three National Junior Scientific Officers (JSOs) appointed and trained at Kerevat by UNV. Two national staff attended training on fruit fly identifications and quarantine surveillance in Brisbane in June, 1997. Contact with staff of National Agricultural Quarantine and Inspection Agency (NAQIA) and provincial Departments of Primary Industries and training on trapping provided to staff in island areas of PNG by UNV and JSOs. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> One Plant Protection Officer trained in emergency response planning and eradication procedures for four weeks with the Nauru Fruit Fly Eradication Programme in October-November, 1998. <p>May-October 1999</p> <ul style="list-style-type: none"> Three Junior Scientific Officers to attend the hands-on training on eradication techniques and other aspects of fruit fly management in Nauru in November-December 1999. 21 staff attended a training workshop on fruit fly biology, monitoring, control and identifications at UNITECH Rainforest Habitat in Lae in August 1999, run by ACIAR.

<p>Immediate Objective 5: To ensure sustainable technical capacity for coordination of future activities on fruit flies in the Region.</p>	
<p>Output 5.1 A scientific officer within the Pacific Community trained in all aspects of fruit fly taxonomy, biology, ecology, control and quarantine treatments</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> Entomologist (Fruit Flies) commenced duties in April, 1998. Coordination of quarantine surveillance in new countries to the project – see Output 2.1. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> Entomologist (Fruit Flies) resigned as of 13 April. Recruitment action commenced to replace for two years. Assistant Entomologist (Fruit Flies) being recruited under funding from New Zealand Overseas Development Agency – to be trained for 2 years before taking over the coordination of fruit fly activities in the Pacific – see Output 5.2. <p>May-October 1999</p> <ul style="list-style-type: none"> Entomologist (Fruit Flies) (funding from Project) and Assistant Entomologist (Fruit Flies) (funding from New Zealand Government) recruited and commenced duties in September and October, respectively. UNV Entomologist in PNG moved to Entomologist (Fruit Fly) position. Assistant Entomologist position filled by national staff member for Fiji. Action to identify replacement UNV Entomologist in PNG underway.

<p>Output 5.2 Core funding for scientific officer position from SPC at the completion of the project.</p>	<p>May 1997-April 1999</p> <ul style="list-style-type: none"> No activities necessary until mid-1999. Funding for a national trainee under SPC obtained from New Zealand – trainee to be appointed in July, 1999. <p>May-October 1999</p> <ul style="list-style-type: none"> Commenced development of proposal for extension of project to 2003 under the umbrella of the SPC Plant Protection Service, with joint funding from AusAID and UNDP, with parallel funding from the New Zealand Government.
<p>Output 5.3 Two post-graduate scholarships for national staff, awarded on the basis of contribution to the achievements of the project.</p>	<p>May 1997-April 1999</p> <ul style="list-style-type: none"> No activities planned until 1999.

<p>Immediate Objective 6: To promote private sector involvement in sustaining quarantine surveillance and research into fruit fly control and quarantine treatments for commodities destined for export.</p>	
<p>Output 6.1 In countries that are exporting fresh commodities, a scheme of industry levies to support financially surveillance and research and development in field control and quarantine treatment development.</p>	<p>May 1997-September 1998</p> <ul style="list-style-type: none"> Supported the formation of a Fruit and Vegetable Council in Fiji through which levies may be administered. Discussed the prospects of imposing levies at export in Fiji and Tonga – generally, there is support. <p>October 1998-April 1999</p> <ul style="list-style-type: none"> Support, in principle, for levy of 1¢ per kg of produce exported from Natures Way Co-operative (Fiji) Ltd for research. <p>May-October 1999</p> <ul style="list-style-type: none"> No additional action.
<p>Output 6.2 Private sector advisory groups to determine how funds derived from levies should be spent to benefit research for farmers and exporters at all levels.</p>	<p>May 1997-October 1999</p> <ul style="list-style-type: none"> No activities, other than those of Output 6.1