ミニッツ：合同評価報告書

MINUTES of DISCUSSIONS
on
THE FOURTH COORDINATING COMMITTEE
for
THE FRUIT TREE PROTECTION PROJECT
in
THE ORIENTAL REPUBLIC OF URUGUAY

The Joint Coordinating Committee Meeting for the Fruit Tree Protection Project (hereinafter referred to as 'the Project') was held between Uruguayan and Japanese sides concerned at headquarter of Instituto Nacional de Investigación Agropecuaria (hereinafter referred to as 'INIA'), Montevideo on August 26th, 1999.

Both sides discussed the Final Evaluation Report which was presented by the Joint Evaluation Committee, jointly organized by Japan International Cooperation Agency and INIA

The Joint Coordinating Committee has agreed and accepted the report presented by the Joint Evaluation Committee and taken note of the Recommendations made for sustaining the Project achievements.

Montevideo, August 26th, 1999

Dr. Ryosuke OGATA
Leader
Japanese Experts Team
Japan International Cooperation Agency
Japan

Ing.Agr. Pedro BONINO
President of the Board of Directors
Instituto Nacional de Investigación Agropecuaria
The Oriental Republic of Uruguay

FINAL EVALUATION REPORT
on
THE FRUIT TREE PROTECTION PROJECT
in
THE ORIENTAL REPUBLIC OF URUGUAY

Japan International Cooperation Agency (hereinafter referred to as 'JICA'), organized the Final Evaluation Team (hereinafter referred to as 'the Team') headed by Dr. Akira KUDO, Director, Department of Plant Protection, National Institute of Fruit Tree Science, Ministry of Agriculture, Forestry and Fisheries and assigned to the Oriental Republic of Uruguay from 15th to 30th August, 1999.

Instituto Nacional de Investigación Agropecuaria (hereinafter referred to as 'INIA') also organized the Team headed by Ing.Agr. Roberto Zoppolo, Supervisor in the field of horticulture, INIA.

The Joint Evaluation Committee consisted of 5 members from JICA and 4 members from Uruguayan side was organized to conduct the final evaluation for the Fruit Tree Protection Project (hereinafter referred to as 'the Project').

The Joint Evaluation Committee conducted evaluation activities through studying documents, interviewing and surveying the sites.

Arising from the above, the Team hereby jointly agreed to forward to their respective Governments the summary report of the evaluation and recommendations which are referred to the documents attached.

Montevideo, August 26th, 1999

Dr. Akira KUDO
Leader
Japanese Final Evaluation Team
Japan International Cooperation Agency
Japan

Ing.Agr. Roberto ZOPPOLO
Leader
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Instituto Nacional de Investigación Agropecuaria
The Oriental Republic of Uruguay

FINAL EVALUATION REPORT
ON
THE FRUIT TREE PROTECTION PROJECT
IN
THE ORIENTAL REPUBLIC OF URUGUAY

AUGUST 26th, 1999

JAPAN - URUGUAY
JOINT EVALUATION COMMITTEE

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1. Objective of the Project

1-1. Overall Goal

To improve citrus producers' cultivation techniques for the production of high quality citrus fruits and to promote the stable management of citrus fruit cultivation.

1-2. Project Purpose

To enhance research capabilities in order to solve technical problems related to plant protection and the orchard management of citrus trees at INIA (National Institute of Agricultural Research).

1-3. Activities and Outputs of the Project

1-3-1. Activities

To transfer research methods through the following activities;

- The investigation and analysis of major constrains in the following fields.

1) Disease control
2) Insect pest control
3) Orchard management

- Research for the development of counter measures against the major constrains in the above mentioned fields.

1-3-2. Outputs

The following outputs are expected to be obtained in the above mentioned fields.

1) The identification of major constrains.
2) The improvement of practical technology.
3) The making-up of technical manuals.
4) The strengthening of research activities of the Uruguayan counterpart personnel.

2. Objective and Method of the Evaluation

2-1. Purposes of the Evaluation

2-1-1. Aims of the Evaluation

The evaluation activities were performed with the aims of:

1) Verifying the degree of achievement of the Project target set in R/D and modified in the occasion of mid-term evaluation;
2) Assessing whether the Project has chance of fully attaining sustainability after the termination of the cooperation period;
3) Assessing what sort of effects are being produced, to what extent they are produced and how far reaching they are, if they are already evident; and
4) Determining whether it is proper to terminate the Japanese cooperation as originally designed.

2-1-2. Items of the Evaluation

The following items were evaluated.

1) Propriety of the Project Purpose
2) Efficiency of Inputs
3) Degree of achievement
4) Impact of the Project (Project level, Sector level ,Regional level and Macro level)
 - Technical Impact
 - Institutional Impact
 - Economic Impact
 - Socio-cultural Impact
 - Environmental Impact
5) Prospects for the Sustainability
 - Prospects for organizational sustainability
 - Prospects for financial sustainability
 - Prospects for material and technical sustainability
 - Factors inhibiting sustainable management and operation

2-2. Composition of the Joint Evaluation Committee

The evaluation was jointly conducted by both the Japanese and Uruguayan members.

1) Japanese members

1. Dr. Akira KUDO

Director, Department of Plant Protection,
National Institute of Fruit Tree Science,
Ministry of Agriculture, Forestry and Fisheries (MAFF)

2. Mr. Takeshi KIHARA

Associate Director for Research,
Department of Citriculture, National Institute of Fruit Tree Science,
MAFF

3. Dr. Shinkichi KOMAZAKI

Chief of Laboratory of Entomology,
Persimmon and Grape Research Center,
National Institute of Fruit Tree Science, MAFF

4. Mr. Hideyuki TAKUMA

Senior Technical Officer, Technical Cooperation Division,
International Affairs Department, Economic Affairs Bureau, MAFF

5. Mr.Jiro TAKEICHI

Project Management Officer, Livestock and Horticulture Division,
Agricultural Development Cooperation Department,
Japan International Cooperation Agency (JICA)

2) Uruguayan members

1. Ing.Agr. Roberto ZOPPOLO

Supervisor in the field of horticulture,
Instituto Nacional de Investigación Agropecuaria (INIA)

2. Ing.Agr. Jose VILLAMIL

Director, Las Brujas Experimental Station,
INIA

3. Ing.Agr. Edgardo DISEGNA

Chief, National Program of Fruticulture

4. Ing.Agr. Juan Carlos DIEZ

General manager, Packing Solari Enterprise

2-3. Schedule of the Evaluation

Date		Schedule
1	19 (Thu)	First Joint Evaluation Committee meeting Joint evaluation practice (document study and interview)
2	20 (Fri)	Joint evaluation practice (field study) Preparation of the Final Evaluation Report
3	21 (Sat)	Meeting with Japanese expert team
4	22 (Sun)	Salto→Montevideo
5	23 (Mon)	Second Joint Evaluation Committee meeting
6	24 (Tue)	Meeting with head quarter of INIA Preparation of the Minutes of Discussions
7	25 (Wed)	Preparation of documents
8	26 (Thu)	Joint Coordinating Committee Signing of M/D

2-4. Method of the Evaluation

The Joint Evaluation Committee spent approximately ten days of time carrying out the following activities:

1) Brief review of Project activities undertaken so far through technical presentations by the Uruguayan Counterpart personnel (hereinafter referred to as 'C/P');
2) Brief interviews in individual sessions both the JICA Experts and the Uruguayan C/P;
3) Consultation meetings with INIA high ranking officials;
4) Field study of the Project site (INIA Salto Grande); and
5) Analysis of observations and findings under the key headings identified during the inception meeting of the Joint Evaluation Committee.

3. Results of the Evaluations

3-1. Propriety of the Project Purpose

Even now, as same as when the Project had been designed, citrus is one of the major export items of Uruguay, and the national policy to promote citrus cultivation has not been modified. For the purpose to further develop citrus industry in Uruguay, there are still strong requirement for consultation on issues of fruit tree protection and orchard management. Therefore, both the Project purpose and the overall goal set is evaluated as appropriate.

3-2. Efficiency of Inputs

Although there were certain periods that long-term expert was absent, techniques were transferred adequately because of substitution by Team Leader and dispatch of short-term experts.

A part of C/P allocated in early stage of the Project were not full-time dedicated to the Project. However this has been solved because INIA added a number of C/P to the Project.

Research capability of C/P has been strengthen because eleven C/P acquired techniques and knowledge from Japanese institute as trainee. These training contribute to the achievement of the Project purpose.

As the Project stage proceeded, the equipment provided by JICA had been delivered to the Project site quickly because the procurement of equipment in Uruguay was promoted gradually.

The summarized inputs from both sides are shown in Annex 1 to 7.

3-3. Degree of achievement

Activities of the Project were widely diversified. However, to achieve the target of the Project, counterparts have been working vigorously in major research and investigation activities. The progress of the Project activities was analyzed and evaluated.

The summarized results are shown in Annex 8.

3-3-1. Disease Control

3-3-1-1. Fungal diseases on fruit

(1) Disease occurrence

Survey of disease occurrence on citrus was performed in the northwestern area of Uruguay on early three years. Scab, melanose and greasy spot were recognized as important diseases, moreover, occurring period of Phytophthora fruit rot was also

clarified. For scab, symptom on fruit differs from that of Japanese scab, infection period, damage on fruit, infection source, overwinter parts and environmental conditions of disease development were shown.

As many findings were gained according to research program, the aim was completed.

(2) Diagnosis and identification of causal agents

To clarify the biological details of the causal fungus, it is necessary to control diseases.

Identification of the causal fungus of scab, the most important fungal disease on citrus in Uruguay, revealed some classificational findings which were assumed firstly in Uruguay.

These findings which have effect on the quarantine problem of Uruguay, so it has permitted only the identification of *Elsinoe fawcettii*. In none of other samples, it was possible to find *E. australies* strains.

The Project purpose on this item was transferring the technology necessary for diagnosis and identification of causal agents. With this technique, it will be possible to continue this work with greacy spot and Phytophthora rot in the future.

(3) Control measures

Research items to control scab, melanose and post-harvest diseases efficiently set and these research activities have been executed smoothly.

Especially the result that existence of citrus scab fungus resistant to benzimidazole fungicides in Uruguay has revealed should be rated high because this result will supply valuable information to make up a counterplan in future for disease control.

According to the existence of benomyl resistant strain, the Project has started to examine alternative fungicides and it is recommended to make up integrated disease management for scab, including melanose and post-harvest diseases from now on.

3-3-1-2. Virus and virus-like diseases

(1) Study on occurrence and transmission

Occurrence and transmission of psorosis, the most important virus-like disease in Uruguay, were studied. Occurrence and distribution of psorosis were clearly shown. It is not determined whether transmission occurred through seeds or by insects (aphids). Because transmission study can not be completed in a short period of the Project and the causal agent is not identified, and techniques for studying this problem were transferred to Uruguay researchers, Uruguay committee decided to continue this study.

(2) Study on mild strain

Fifty-three isolates of citrus tristeza virus were obtained from pomelo and other

cultivars.

Techniques and methods concerned in this item are already transferred to Uruguayan side. Effective mild strain will be selected from the isolates by clarification and pathogenecity.

(3) Management of virus free mother tree

584 virus free plantlets were obtained of 231 citrus cultivars in Uruguay by micrografting.

After confirmation to be virus free, plantlets are kept in increasing block under insect free conditions. This activity will continue by C/P in future.

3-3-2. Insect Pest Control

3-3-2-1. Forecasting technique for major pests

(1) Identification and classification

Thrips and mites were collected from citrus groves. Specimens in gum chloral were examined. Several species of thrips were found and *Frankliniella allochroos* was dominant. All of eriophyid mites collected from Valencia orange orchard were identified to be the citrus rust mite, *Phyllocoptrura oleivora*. The aim of this item was completed.

(2) Monitoring method

Seasonal prevalence of thrips and California red scale were monitored with the yellow plate sticky and the sex pheromon trap respectively. The proportion of fruits infested was determined for these two species. Population densities of the citrus rust mite on leaves and fruits, and their fruit damage were also observed. Seasonal prevalence of main pests were documented and the best sampling method was clarified from four years study.

The biology of citrus whitefly and their damage were analyzed from the previous data collected in Uruguay. Citrus whitefly is estimated to have three generations per year and the peak of the first generation adult emergence was attained at the beginning of November.

The aim of this item was almost completed. Studies on citrus leaf miner generations and hibernating stage will be continued by C/P with transferred techniques.

(3) Forecasting method of occurrence

Forecasting method was studied for thrips and California red scale in four years field survey. For thrips, the importance of monitoring in flowering (primary) and summer (secondary) was pointed out. For California red scale, appearance time of the first and second generations was primary factor. The aim of this item was almost

completed. Accumulation of data by C/P is necessary to construct a better forecasting system with transferred techniques of data collection and analysis.

3-3-2-2. Integrated control

(1) Identification of natural enemies

Natural enemies of major insect pests, including citrus leafminer were collected with beating in citrus orchards and parasitization of parasite of California red scale were monitored. One species of the tribe Serangiini (Coleoptera, Coccinellidae), *Ceraeochrysa* sp. (Neuroptera, Chrysopidea) and *Amblyseius brazilli* (Acari, Photoseiidae) were found as predators of thrips. *Amblyseius brazilli*, *A. inouei* and *Stethorus* sp. were the predator of the mites. For California red scale, an important parasitoid wasp was *Aphytis melinus* and two ladybeetles of the tribe Serangiini and Microweiseini were predators. A ladybeetle of the tribe Serangiini was a predator of citrus whitefly. For the leafminer, *Cirrospilus* sp. (Hymenoptera, Eulophidae) was an important parasitoid. The species of several natural enemies were not identified. Method identification was transferred. Determination of species will be done by Uruguayan researcher. Survey of native hosts of *Cirrospilus* sp. and other potential native parasitoids remained as study items and will be done by Uruguayan researcher.

(2) Integration of selective control measures

Parasitization of several parasitoid species of California red scale and food habits of predators of mite were studied. California red scale was highly parasitized by *Aphytis melinus* in many citrus groves. Amblyseius sp. ate a large number of citrus rust mites. Evaluation of the efficiency of these species as the biological control agent is necessary. It will be continued by Uruguayan researchers using transferred techniques.

Long-term effects of pesticide application on phytoseiid mites were examined for 11 chemicals by interval sampling after spray. 'Fenbutatin' (acaricide), CGA (IGR), 'Abamectin' and 'Imidacloprid' (insecticide) were not so harmful to phytoseiid.

The arthropod fauna was compared between selective and non-selective insecticide applied plots. *Aphytis melinus* and phytoseiid mite were more abundant in selective insecticide applied plots. The effect of another selective insecticide on the density of the natural enemies and California red scale is now being analyzed. The result will be achieved at the end of the Project.

Effectiveness of 11 pesticide to citrus leafminer was examined. 'Abamectine' was most effective, in the next place 'Imidacloprid', 'Diflubenzuron' and 'Cypermethrin'. To find out more effective insecticides is necessary. This will be continued by C/P with transferred techniques.

Introduction, release and evaluation of exotic parasitoids is planned. Using transferred parasitoid treating technique, *Ageniaspis citricola* shall be introduced from

Argentine with cooperation of the University.

The aim of this item was almost completed. Remaining problem will be studied by Uruguayan researchers.

(3) Appropriate control

Oviposition habit and living area on fruits were studied on Murcott and showed that the most vulnerable time was from flowering to petal falling. The injury level by thrips were compared among five varieties of citrus. Murcott was most severely damaged by thrips and the second was Ellendale. As these results were achieved, the aim of the item was completed.

3-3-3. Orchard management

3-3-3-1. Improvement of tree management

(1) Stabilization of fruit setting

The study on the effect of fruit thinning was carried out in order to prevent of alternate bearing on Satsuma and to establish technology for the stabilization of fruit bearing. The fruit thinning resulted in larger fruit. The effect of chemical fruit thinning agent on thinning was positive. However the effect at practical use was unstable.

Through the technical transferring, the goal of this item has been achieved. Furthermore these problems would be solved, and a technology for extension would be developed through C/P continuing these experiment.

The study of ringing was carried out in order to prevent the physiological fruit drop of Ellendale which is unstable on fruit setting. It was clear that the physiological fruit drop is reduced with treatment of ringing before flowering.

The goal of this item has been achieved because the technology to prevent physiological fruit drop has been established. Moreover it is expected that technology will be established through C/P continuing these experiment especially the study on frequency of ringing.

The study on the effect of pruning was carried out in order to stable the annual fruit production of Satsuma and Ellendale. It has been clear that the effect on lightness in tree crown and fruit development and so on by pruning technology for getting the stable effect will be developed through C/P continuing the experiment of pruning intensity and so on.

The relation between planting density and yield for Satsuma was analyzed in order to get high production of fruits from unit area. In this item, the final result has not been achieved because the experiment was started 2 years ago.

However the significant technologies which include the methods of study were already transferred, it is expected that sustainable planting density of Satsuma will be established through C/P continuing to research of this item.

(2) Control of physiological disorders on fruit.

For valencia orange, GA spraying has been recognized as prevention techniques of creasing, so objective of this item has been achieved.

For navel orange, there is relation between creasing and Ca concentration in soil, so C/P should continue to study for clarifying the relation with transferred techniques.

A study about effectiveness of chemical application at pre- and post-harvest has been carried out to improve quality of fruits. To clear effectiveness of improving post-harvest treatment on fruits was an important achievement. Effects of other chemicals, for example Madec to prevent calyx drop, $CaCO_3$ to prevent puffing and so on, are also cleared but these results haven't led to stable techniques yet. So C/P should continue the study by themselves to establish those techniques. Techniques and methods concerned in this item are already transferred to C/P.

(3) Determination of optimum time for harvest and yield prediction

The study to make growth curve for each variety has been carried out to determine optimum time of harvesting major cultivars. But maturing period deeply depends on weather conditions, so C/P should continue to accumulate data by means of transferred techniques to determine indicator of maturing period.

Techniques to predict fruit yield by means of phenological inspection have been transferred to C/P. So they should continue the inspection because it needs to accumulate more information to predict fruit yield stably.

(4) Methods of fast evaluation of cultivars

Starting the experiment of this item was late until Dec. 1996, because of C/P finishing his master degree. The experiment of making a comparison between the several methods of grafting was carried out in order to get the bearing age in a few years after grafting. But it was impossible to continue to do this experiment because all trees were cut down by the accident. It is important to investigate the characteristics of citrus cultivars in early stage of growing. The technology which makes it possible to shorten the period between breeding and description of the fruit as methods of quick evaluation of new cultivars has been transferred through C/P training in Japan.

It is expected that this method will be valuable as the technique of breeding.

3-3-3-2. Nutrition and water management

(1) Characterization of fertilizer application

The study of fertilizer application in 9 treatments has been carried out to clear amounts of nitrogen and potassium application for Satsuma. Present outputs that C/P recognize certain relation between amounts of fertilizer applied and production of citrus can be estimated. But C/P should continue the experiment because it takes long time to know the effectiveness of fertilizer.

(2) Irrigation scheduling

The study of moisture potential of soil and leaf has been carried out to clear appropriate moisture condition of soil and tree. As a result, it is worth to estimate that irrigation schedule according to relation between moisture holding capacity and osmosis was determined. Although it is necessary to accumulate more information from different soil types related to water potential by C/P, methods of experiment have been already transferred.

The experiment of irrigation has been carried out at each season to clear effectiveness of irrigation and appropriate timing of irrigation. Effectiveness of irrigation to young trees in latter stage of growing has been recognized. Experiment with adult trees hasn't been executed yet, so C/P will continue the experiment with transferred techniques.

The experiment of irrigation with different amount has been carried out to know appropriate amount of irrigation in growth stage of citrus. Needs of irrigation were cleared but C/P will continue the experiment to determine appropriate amount of irrigation, with enough years of repetition

The irrigation experiment with different irrigation systems has been carried out to evaluate each system. Information about accuracy of systems that was acquired as a result of the experiment is expected to utilize when grower has to choose irrigation system suitable for each orchard.

3-4. Impact of the Project

3-4-1. Technical Impact

The research potential of C/P has been strengthen through the technical transfer by Japanese experts and C/P training in Japan. (Project level)

The problems for increasing the percentage of exportable fruit can be solved because technologies concerning plant protection and orchard management were improved. (Sector level)

The citrus industry which keeps export in mind will be developed through grasping ecological and meteorological characteristics. (Regional and Macro level)

3-4-2. Economic Impact

The budget allocation for INIA will be increased because the percentage of exportable fruit can be increased. (Sector level)

3-4-3. Socio-cultural Impact

Acceptance of C/P and guidance by Japanese experts has promoted Uruguayan understanding to Japanese Socio-cultural things. (Project level)

It has been more easy to exchange views between scientists and orchard growers

because of open information that was obtained in the Project. (Sector level)

3-4-4. Environmental Impact

It has been able to reduce the number of times spraying pesticides. (Project)

Interest to environmental protection has been enhanced through development of crop protection and storage techniques. (sector and regional)

3-5. Prospects for the Sustainability

3-5-1. Prospects for organizational sustainability

In Uruguay, the Citrus Planning Committee that consists of representatives from the government and private sector has been organized since long ago. The committee makes and executes policies concerning about citrus, and also develops citrus markets. In these activities, the committee entrust research activities to INIA. INIA has 5 experimental stations along the country. Salto Grande station mainly studies about citrus and 12 counterpart personnel are allocated to the Project (a part of C/P are allocated at Las Brujas station).

INIA has been steady working since its creation by low in 1989. The citrus research was started more than 50 years ago. INIA fortified this work and even more with the Project. C/P will continue their studies and works.

3-5-2. Prospects for financial sustainability

Annual budget of INIA consists of a tax paid by farmers, governmental and self-raised funds. Funds from the government are fixed as an equal amount to the tax paid by farmers when they sell the agricultural products. According to 1996 census of citrus production, amount of citrus production is inclined to increase, so funds from the government are expected to be stably transferred to INIA from now on.

On the other hand, INIA sells citrus rootstocks and virus-free nursery stocks. The sales of these stocks are important self-raised fund of INIA.

3-5-3. Prospects for material and technical sustainability

Now, the outputs acquired in the Project are being verified in aspect of practical use by C/P and as soon as verification is finished, these outputs will be supplied to fruit growers as a form like manual. So the technology transferred in the Project is enough for implementing the post-Project activities by C/P independently.

4. Conclusion and Recommendation

4-1. Conclusion

Research activities for disease control, insect pest control and orchard management have been carried out extensively which clarified the scientific aspects concerned about plant protection.

By transferring techniques from Japanese experts and through the training in Japan, the Joint Evaluation Committee recognized that research capabilities of C/P had reached at the level to study independently.

Facilities and equipment for research activities were sufficiently provided and they have been used effectively and kept in good condition throughout the Project period.

The Joint Evaluation Committee concluded that the Project purpose has been achieved thus it is appropriate for the Project of its five-year cooperation to come to an end on February 29th, 2000.

4-2. Recommendation

C/P should continue these activities to pile up data independently because it takes long time to accumulate data concerned about most items of the Project for practical use.

The data and findings confirmed at practical use will be utilized to plant protection and open to fruit growers by INIA.

Facilities and equipment provided in the Project should be used effectively and kept in good condition even after the Project termination.

ANNEX 1

Dispatch of Japanese Experts

(Long-term Experts)

Name	Fields	Period
Hiroyasu TANAKA	Leader·Disease Control	1995. 3. 1～1997. 5.31
Koichi INOUE	Insect Pest Control	1995. 3. 1～1998. 2.28
Keiichi ISHIKAWA	Orchard Management	1995. 3. 1～1997. 4.30
Sakae MAGOSHI	Coordinator	1995. 3. 1～2000. 2.29
Ryousuke OGATA	Leader·Orchard Management	1997. 4.16～2000. 2.29
Tsutomu SAKUMA	Disease Control	1998. 2.28～2000. 2.29
Sei SAKURAI	Insect Pest Control	1998. 5.20～2000. 2.29

(Short-term Experts)

Name	Fields	Period
Takesi KIHARA	Optimal time for harvest and yield prediction	1995. 8. 5～1995.11. 4
Hiroshi YAKUSHIZI	Water management	1995.10. 2～1995.12.24
Katsumi OZAKI	Citrus scab	1995.10.21～1995.12.20
Takesi KIHARA	Management for fruit setting	1996.10.16～1996.12.20
Masahiro YAMANAKA	Natural enemy	1996.10.16～1996.12.20
Osamu TERAI	Physiological disorders in the fruit	1997. 3.22～1997. 5.21
Humitaka TAKISHITA	Early estimation methods	1997. 9.29～1997.11.14
Masaaki TAKANASHI	Selection of selective chemical	1997.10.15～1997.12.14
Tatsushi OGATA	Post Harvest physiology	1998. 2.14～1998. 4.14
Tohru IWANAMI	Plant pathology	1998. 2.28～1998. 4.27
Kazuaki KAMIJO	Identification on natural enemies of citrus leaf miner	1999. 5.21～1999. 6.28
Shinichi SHIRAISHI	Post harvest management of citrus fruit	1999. 6.17～1999. 8.12

ANNEX 2

Acceptance of Counterpart Personnel in Japan

(1994)

Name	Fields	Period
Teofilo PEREIRA MICOUD	Administration for Agricultural Research	1995. 3.12～1995. 3.28

(1995)

Name	Fields	Period
Cesar CERONI	Administration for Agricultural Research	1996. 2.12～1996. 2.27
Eduardo INDARTE	Administration for Agricultural Research	1996. 2.12～1996. 2.27
Diego MAESO	Virus Indexing and Virus Free Material Production	1996. 2.26～1996. 6. 5
Alvaro OTERO	Practice of Tree Management	1996. 3.26～1996. 7.31
Jose BUENAHORA	Methodology of ecological study on insect pests and natural enemies	1996. 3.26～1996. 7.31

(1996)

Name	Fields	Period
Carmen GONI	Citrus nutrition and irrigation	1996. 6.19～1996. 9.11
Juan Pedro HONIE	Administration for Agricultural Research	1996.10.21～1996.11. 6
Eduardo de la ROSA	Administration for Agricultural Research	1996.10.21～1996.11. 6

(1997)

Name	Fields	Period
Saturnino NUNEZ	Identification of Thrips	1997. 5.14～1997. 6.29
Cristina PAGANI	Identification of Diagnosis of Main Fungal Diseases	1997. 5.21～1997. 8.20
Ismael MULLER	Management of Post Harvested Fruit And its Physiological Disorder	1997.10.29～1997.12. 3

(1998)

Name	Fields	Period
Ana BERTALMIO	Diagnosis and Identificaion of Citrus Virus	1998. 6. 1～1996. 7.15
Marcelo RICHARD	Ecological Meteorology	1998.10. 5～1998.11.10
Fernando CARRAU	Fast Methodology for Cultivar Evaluation	1998.10. 5～1998.12. 8

PROVISION AND UTILIZATION OF EQUIPMENT AND MACHINERY

SUPPLY FROM JAPAN

(¥)

YEAR	AREA	No.	DESCRIPTION OF EQUIPMENT AND MATERIALS	COMPANY	DAIRY USE OR NOT	DAILY CONTROL	QUANTITY	UNIT PRICE	PRICE TOTAL
1994	DISEASE CONTROL	1	SOIL PRESSURE STERILIZER: TXB-4 WITH STERILIZING CAN	TAKASAKI	A	A	1 SET 12 PCS	 40,000	9,400,000 480,000
		2	KNAPSACK SPRAYER: TYPE-250"	FUJIWARA	B	A	2 SETS	40,000	80,000
		3	HOT AIR STERILIZER: CM-8E	HIRASAWA	A	A	1 SET		515,000
	INSECT PEST CONTROL	9-1	STEREOSCOPIC MICROSCOPE OLYMPUS SZH-10-131 PM10-AK3-35AC	OLYMPUS	A	A	1 SET		1,098,000
		9-2	SISTEM MICROSCOPE : OLYMPUS BX50-33-PHD	OLYMPUS	A	A	1 SET		1,034,000
		10	FIBER OPTIC ILLUMINATOR LGW-1 OLYMPUS DOUBLE LIGHT GUIDE 150W HALOGEN	OLYMPUS	A	A	1 SET		144,000
		11	CLOSE UP EQUIPMENT CAMERASTAND "C" TYPE WITH 10 LAMP	SFC	B	A	1 SET		210,000
	ORCHARD MANAGEMENT	12	FRUIT ACID APPARATUS NH-1000	NICHI EN NOKYOU	A	A	1 SET		1,200,000
		13	INCUBATOR FOR SEED MIR-25SPN	IKEDA	A	A	1 SET		570,000
		14	FRUIT SEPARATOR MS-5R	TAIYO	A	B	1 SET		415,000
		16	TENSION METERS: DIK 3100 MERCURY MANOMETER DIK 1720 WITH AUGER FOR TENSIONMETER	DAIKI	A	A	1 SET		746,000
		17	PLANT MOISTURE TENSIONMETER: DIK-7000 PC.40 TYPE	DAIKI	A	B	1 SET		714,000
		18	ION CONDUCTIVE APARATUS	HORIBA	B	B	1 SET		784,000

			HORIBA F-23						
		19	SOIL SAMPLER SET SAMPLER 1PCS JOINT STICK 2PCS SUPPLIMENTAL SOIL	DAIKI	B	B	1 SET		106,000
		20	SOIL PH-EC METER PF METER D-12 EC METER ES-12	HORIBA	B	A	1 SET		456,000
		21	AUTOMATIC LEVEL SETS: SOKIA B-21	SOKIA	B	B	1 SET		183,000
		22	ELECTRONIC BALANCE FN-100KAI	A & D	A	A	1 SET		135,000
		23	PERMERMETER DIK-4000	DAIKI	B	B	1 SET		327,000
		24	CYLINDRICAL INTAKERATE METER DIK-4200	DAIKI	B	B	1 SET		365,000
		25	CONE PENETROMETER DIK-5520	DAIKI	B	B	1 SET		273,000
		27	OXYGEN DIFFUSION RATE METER DIK-5100	DAIKI	B	B	1 SET		525,000
	COMMON	1	MINIBUS WITH SPARE PARTS P15WHLZL 2,477cc DIESEL 2WD	MITSUBISHI	A	A	1 UNIT		1,670,145
1995	DISEASE CONTROL	A-1	ZOOM STEREO MICROSCOPE SZH-10-131 SPARE LAMP 6V20W HAL	OLYMPUS			1 6	 2,000	518,000 12,000
		A-2	LIGHT GUIDE LGW-1 SPARE LAMP 15V 150W	OLYMPUS	A	A	1 6	 8,000	126,000 48,000
		A-3	CLEAN BENCH MCV-13BSS GAS BURNER STERILIZATION LAMP FLUORESCENT LAMP 40W HEPA FILTER(FOR WORK FILTER) HEPA FILTER (FOR EXHAUST)	SANYO	A	A	1 1 2 4 3 3	 5,500 1,500 55,000 25,000	1,119,000 23,000 11,000 6,000 165,000 75,000

		A-4	LOW TEMPERATURE INCUBATOR 1-2140-01	ISUZU	B	B	1	1,090,000
			OBSERVATION WINDOW 1-3000-12				1	120,000
		A-5	DISPENSER H-07846-40	COLE PALMER	A	A	1	75,000
		A-6	SHAKER H-51700-05	COLE PALMER	B	B	1	350,000
			SHAKING PLATE 250ML H-04732-32				1	59,000
			SHAKING PLATE 125ML H-04732-33				1	59,000
			SHAKING PLATE 50ML H-04732-34				1	59,000
		A-7	GROWTH CABINET MLR-350	SANYO	B	B	1	1,240,000
			FLUORESCENT LAMP 40W				16	1,500	24,000
		A-8	WATER DISTILLIATION APPARATUS GSH-200	ADVANTECH	A	A	1	425,000
			STAND RUH-200				1	49,000
			SPARE: FILTER TCC-WL-S				6	4,400	26,400
			ION RESIN CARTRIDGE GI-1600				6	9,000	54,000
			ION CARTRIDGE GI-1800				2	12,000	24,000
			WATER FILTER CCS-020-CIH-F				2	9,000	18,000
		B-1	ELECTRO PHORESIS APPARATUS	NIHONEIDOHP	B	B		
			1)NA-1113 True Form				1	78,500
			2)NC-1017 Source of Electrocity Apparatus				1	92,000
			3)NA-1100-1 Plate				6	1,800	10,800
			4)NA-1100-2 Plate				6	1,800	10,800
			5)NA-1100-4 Comb				2	2,900	5,800
			6)NA-1100-13 Clip				8	150	1,200
			7)NA-1100-14 Seal Tube				6	200	1,200
			8)NA-1100-16 Packing				4	500	2,000
			9)NA-1100-17 Lead Line				1	1,300
			10)NA-1100-18 Stand				1	14,000
			11)NA-1100-19 Comb 20				2	3,600	7,200
			12)NA-1100-20 Comb 16				2	2,800	5,600
		B-2	CLEAN BENCH	IKEMOTORIKA	A	A	1	775,000
			FLUORESCENCE LAMP 15W				6	480	2,880
			STERITZATION LAMP 15W				2	2,400	4,800
			FILTER				1	3,200
		B-3	FREEZER	IKEDARIKA	A	A	1	640,000

			ULTRA -ROW TEMPERATURE DF-10						
		B-4	THEMO-HYDROGRAPH 3-3122-01	ISUZU	A	A	1		33,000
			1)CHART PAPER				1		1,200
			2)CARTRIDGE PEN				2	900	1,800
		B-5	PHOTOGRAPHIC APPARATUS	OLYMPUS	A	A	1		692,000
			1)FILTER PM-FIL-C				1		25,200
			2)FILTER 45G 533						2,000
			2)FILTER 450560				1		8,000
	INSECT PEST CONTROL	A-9	SPRAYER OF AGRICULTURAL CHEMICAL DIK-7320	DAIKI	B	A	1		1,050,000
		A-10-1	SOIL NEMATODE DETECTION KIT	FUJIHIRA	B	B	1		229,000
		A-10-2	SYRACUSE WATCH GLASS B2	FUJIHIRA			50	2,100	105,000
		A-10-3	NEMATODE SAMPLE TUBE	FUJIHIRA			200	100	20,000
		A-10-4	SORTING DISH	FUJIHIRA			20	800	16,000
		A-10-5	TABLE TOP CENTRIFUGE H-103N	KOKUSAN			1		145,000
			ROTOR RF-110				1		68,000
			CASE PB-110				1		27,000
			CASE MC-110						15,200
			GLASS TUBE GT-13-1					1,100	5,500
			GLASS TUBE GT-11-1						9,600
			SAPRE:						
			GLASS TUBE 15ML				10	1,100	11,000
			GLASS TUBE 50ML				1		9,600
			CARBON BRUSH CB-16				10	460	4,600
		A-10-6	TUBE 50ML PPT-040	KOKUSANN			10	470	4,700
	ORCHARD MANAGEMENT	A-11	CARRIER FG182SD	YANMER	A	A	1		779,000
			SPARE PARTS				1		116,800
		A-12	ELECTRONIC BALANCE FP-6200	A&D	A	B	1		117,000
		A-13	LOW TEMPERATURE TEST CHAMBER MIR-253	SANYO	A	A	1		424,000
		A-14	TILLER PRT751	YANMER	A	A	1		502,000
			SPARE PARTS				1		75,300
		B-6	AREA METER LI- 3000A/E	MEIWASHOJI	B	B	1		1,643,520
		A-15	WIDE RANGE PF METER DIK-3400	DAIKI	A	A	1		1,800,000

		A-16	HIGH PRESSURE AIR COMPRESSOR DIK-9260	DAIKI	A	A	1		670,000
		A-17	GROUND THERMOMETER KDC-S1-W-10 BATTERY PACK RS232C ADPTER SOFT RS232C CABLE	KOHNASYSTEM	A	A	5 10 1 1 1	192,000 4,400	960,000 54,000 10,200 146,000 10,200
		A-18	EMISSION THERMOMETER 505	MINOLTA	A	B	1		102,000
		A-19	PERSOMAL COMPUTER LX4100D PRINTER CABLE TONER CARTRIDGE SOFT MS OFFICE PRO(E) TRANSFORMER	DELL	A	A	1 1 5 1 1	 16,500 	237,000 187,000 82,500 77,000 12,000
		A-20	DRYING OVEN EZ-212S	ISUZU	A	B	1		1,087,800
		A-21	DIGITAL BURET H-07910-12	COLEPALMER	A	A	1		16,000
		A-22	INSOLATION SENSOR KDC-CM6B BATTERY PACK CASE	MINOLTA	A	A	1 2 1	 4,500 	440,000 9,000 21,000
		A-23	DIGITAL ILLUMINO METER T-1M	MINOLTA	A	B	1		120,000
		A-24	HOT PLATE STIRRER SR-550	ADVANTECH	A	B	1		35,000
		A-25	WATER DISTILATION APPARUTUS GS-200 STAND GK-200 SPARE: ION RESIN CARTRIDGE GI-1600 FILTER TCC-WL-S	ADVANTECH	A	A	1 1 12 6	 9,000 5,600	420,000 46,000 108,000 33,600
		B-7	PARTICLE SIZE ANALYZER DiK-2020	DAIKI	B	B	1		164,000
		B-8	ROOT AUGER DIK-1645	DAIKI	B	B	1		73,000
	COMMON	A-26	CAMERA F-601 LENS 60MM F2.8D LENS 180MM F2.8D	NIKON	B	A	1 1 1		68,000 43,000 75,000

1996	DISEASE CONTROL	1	CULTURE INCUBATOR CI-450SM	IUCHI	A	A	3	156,000	468,000
		2	INCUBATOR PST-13	SHIMIZURIKA	A	A	1		2,100,000
		3	SHAKER REAX-2000	IUCHI	B	B	1		48,500
		4	WATER BATH ED-1	IUCHI	B	B	1		88,000
		5	ZOOM STEREO MICROSCOPE SZH10-131 SZH-ZB10 10:1 ZOOM MICROSCOPE BODY WITH CLICK STOP INCLUDING DUST COVER SZH-PT PHOTO TUBE WITH RELAY LENS SZH-B145N 45 DEGREES INCLINED LOW EYEPOINT BINOCULAR OBSERVATION TUBE SZH-ILLB TRANS-ILLUMINATOR BASE(KOEHLER) AND PILLAR WITH LOW VOLTAGE CONNECTOR FOR EPI-ILLUMINATOR LS20HM HALOGEN LAMP 6V20WHAL HALOGEN BULBS UYCP POWER CORD SZH-DFPLAP01X DISTORTION FEE PLAN APORCHROMAT OBJECTIVE 1X GWH10X-D EYEPIECE 10X, F.N.24, FOCUSABLE GWH10X0-CD EYEPIECE 10X F.N.24 WITH CROSS LINE, FOCUSBLE SP-C STAGE PLATE(CLEAR) HALOGEN BULBS 6V20WHAL	OLYMPUS	A	A	1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) 6		510,000
		6	FIBER OPTICS ILLUMINATOR MODEL LGW-1 LGPS FIBER OPTICS LIGHT SOURCE LGW LIGHT GUIDE, INCLUDING COLLECTOR LENS(2PCS) 20G533-LG FILTER FOR BLACK & WHITE PHOTO	OLYMPUS	A	A	1 (1) (1) (1)		110,000

			GRAPHY					
			20LB120-G FILTER FOR COLOR PHOTOGRAPHY			(1)		
			JC15V150WC HALOGEN BULB			(2)		
		7	CAMERA & ACCESSORIES	OLYPUS	A	A	1		420,000
			35mm OM MOUNT CAMERA OM4-TIB-12 SET				(1)		
			OM MOUNT PHOTOMICRO ADAPTER L MOM-L				(1)		
			ZUIK MACRO LENS 38mm F2.8				(1)		
			AUTO BELLOWS				(1)		
			VARIMAGNI FINDER FOR OM SERIES CAMERA MF				(1)		
			VS						
			DOUBLE CABLE RELEASE				(1)		
			ZUIKO ZOOM LENS 35-80mm F2.8				(1)		
			ZUIKO STANDARD LENS 50mm F1.2W/HOOD				(1)		
			T8 RING FLASH 2 W/T POWER CONTROL 1				(1)		
		8	COOLED INCUBATOR	SANYO	B	A	1		595,000
			MODEL: MIR553						
			FLUORESCENT LAMP 15W				4	800	3,200
	INSECT PEST CONTROL	9	PREFAB INCUBATION ROOM	SANYO	B	B	1		2,760,000
			MODEL: MCU-1000(SP)						
			50mm THICKNESS POLYURETHANE PANEL				(1)		
			COOLING UNIT:MCU-1160F(H) 200/50/3				(1)		
			CONTROL PANEL:MCU-200CP				(1)		
			TRANSFORMER:10KVA(AC220V/200V/3P)				(1)		
			INSTALLATION MATERIALS				(1)		
			SHELVING				2	68,000	136,000
		10	NK SYSTEM BIOTRON LH-300-RDS CT	NIPPONIKAKIKAI	B	A	20	1,500	3,000,000
			(AUTOMATIC TEMPERATURE CONTROLLING CHAMBER)						
			FLUORESCENT LAMP 20Wx16pcs 40Wx64PCS				1		45,000
		11	ELECTRIC OVEN	SANYO	A	A	1		156,000
			MODEL:MOV-112(AC220V,50Hz)						
		12	AUTO DESICATER NBG-1M	IUCHISEIEIDOU	A	A	3	71,000	213,000
		13	SHELF 1860FX/63PX	IUCHISEIEIDOU	A	A	2	95,000	190,000
		14	BREEDING BOX	SANSINKOGYOU	B	A	10	18,000	180,000

		15	LABORATORY SHELF	UCHISEIEIDOU	A	A	3	53,000	159,000
		16	ELECTRONIC THERMO-HYGROGRAPH 3-3126-01	SUZUSEISAKUSYO	B	A	3	36,500	109,500
			CARTRIDGE PEN				15	800	12,000
			CHART				3	1,000	3,000
		17	BALANCE PB3001	UCHISEIEIDOU	A	A	1		75,000
		18	HOT PLATE HPA1914B	TOUEI	B	A	1		44,000
	ORCHARD MANAGEMENT	19	BALANCE HV150KAI	UCHISEIEIDOU	A	A	2	67,000	134,000
		20	FREEZE-DRYING APPARATUS VD-400F	TAITEKKU	A	A	1		648,000
		21	PHARMACEUTICAL REFRIGERATOR	SANYO	A	A	1		260,000
			MODEL:MPR311D						
			FLUORESCENT LAMP 20W				2	1,000	2,000
		22	HIGH SPEED STAMP MILL ANS-143PL	UCHISEIEIDOU	A	A	1		180,000
1997	SUELO Y RIEGO	1	ION CHROMATOGRAPH & OTHERS	DIONEX	B	A	1 OT		7,200,000
			50208 DX-120						
1997	FITOPATOLOGIA	1	PLANT GROWTH CHAMBERS	SANYO	B	A	1		931,000
			MODEL: MLR-350						
			SPARE PARTS :FLUORESCENT LAMP 40W				15	2,000	30,000
		2	FOR MICROSCOPE BH-3	OLMPUS	A	A			
			EYEPIECE WHK15XL				2	17,000	34,000
			EYEPIECE NK-20XL				2	12,000	24,000
		3	MEDICAL REFRIGERATOR	SANYO	A	A	1	277,000	277,000
			MPR-311						
			·OPTIONAL ACCESSORIES						
			AUTOMATIC TEMPERATURE RECORDER				1	55,000	55,000
			MTR-0620LH						
			·SPARE PARTS						
			RECORDING PAPERS(12ROLLS/BOX)				2	6,000	12,000
		4	ULTRASONIC CLEANER	TERAUCHIKAGAKUKIKA	B	A	1	466,000	466,000
			IUC-3011N	I					
		5	SHELF	IKEDARIKA	A	A	1	86,000	86,000
			SUPER ERECTER SHELF						
		6	INCUBATOR	SANYO	A	A	2	577,000	1,154,000
			MIR-253						

			·SPARE PARTS FLUORESCENT LAMP				6	2,000	12,000
		7	HANDY CART WT-1A	IKEDARIKA	A	A	2	43,000	86,000
	ENTOMOLOGIA	8	TV CAMERA FOR MICROSCOPE COLOUR VIDEO CAMERA:TX-C1380E1/2CCD(1) 14 INCH COLOUR MONITOR:BMH-1400PN(1) BNC-5NBC:CABLE 5m(1) U-PMTVC: C-MOUNT ADAPTOR(1)	JVC	B	A	1 SET	531,000	531,000
		9	VIDEO TAPE RECORDER SR-S368E	JVC	B	A	1 SET	232,000	232,000
		10	VIDEO CAMERA CCD-TR3400E ·SPARE PARTS RECHARGEABLE BATTERY PACK:NP-F730 Hi-8 VIDEO TAPE	SONY	B	A	1 SET 1 10	260,000 13,000 2,000	260,000 13,000 20,000
		11	ZOOM STEREO MICROSCOPE SZ6045CHI ·SPARE PARTS 6V20W HALOGEN BULB	OLYMPUS	A	A	1 5	355,000 3,000	355,000 15,000
		12	TABLE TOP SLIDE PROJECTOR TWIN CABIN SUPER ·OPTIONAL ACCESSORIES TRANSFORMER(220V/100V) ·SPARE PARTS HALOGEN LAMP	CABIN	B	A	1 1 5	44,000 9,000 3,000	44,000 9,000 15,000
		13	FOLIAR EYEPIECE MICROMETER OSM-4	OLYPUS	B	A	1	121,000	121,000
	CULTIVO	14	ENGINE SPRAYER MS-330EC ·OPTIONAL ACCESSORIES SPARE PARTS HOSE REEL	MARUYAMASEISAKUSYO	B	A	1 1 1	138,000 14,000 44,000	138,000 14,000 44,000

			UNIVERSAL NOZZLE				1	7,000	7,000
		15	DATA LOGGER SOLAC 111 MP-090 DATAMEMORY:OP0012 TRANSFORMER T-TYPE THERMOCOUPLE ·SPARE PARTS CHART PAPPER(10ROLLS/BOX)	EIKOUSEIKI	A	A	1 1 1 1 3	821,000 166,000 28,000 58,000 9,000	821,000 166,000 28,000 58,000 27,000
		16	SOLAR RADIATION METER YM-1	EARTHSCIENCE	A	A	5	58,000	290,000
		17	CO2 GAS METER GH-250E	SENSANIKUSUJAPAN	B	A	1	215,000	215,000
1998	ENTOMOLOGIA	1	ARTIFICIAL WEATHER CONTROLLED INCUBATOR MODEL:LPH-1000RD WITH TRANSFORMER AC220V SPARE FLUORESCENT LAMP,40W SPARE HEATER	NIHONIKAKIKAI	B	A	1 SET 32 1		2,620,000
		2	UNIVERSAL STAND MODEL:SZ-STU2	OLYMPUS	B	A	1 SET		153,900
		3	FIVER OPTICS ILLUMINATOR MODEL:LGR-1	OLYMPUS	A	A	1 SET		157,000
		4	HALOGEN LAMP 15V,150W	OLYMPUS			5	3,100	15,500
	CULTIVO	5	LABORATORY SHELF	SANSHINKOGYOU	A	A	3	51,200	153,600

SUMINISTRADO DE URUGUAY

(US$)

ANO	AREA	Nos	DESCRIPCION DE EQUIPO Y MATERIALES	COMPANIA	EVALUATION OF USER	DAIRY CONTROL	CANTIDAD	UNIDAD	PRECIO TOTAL
1995	FITOPATOLOGIA	1	INVERNACULO ELIMATIZADO PARA TESTAJE	Alfredo Peirano	A	A	1 UNIT		98,246.50
			INVERNACULO DE VIDRIO	Alfredo Peirano	A	A	1 UNIT		98,246.50
	COMUN	2	PEUGEOT Modelo 405	VALIDAL S.A.	A	A	1 UNIT		14,950.00
1996	FITOPATOLOGIA	1	AIRE ACONDICIONADO ELECTRA	BARRACA EUROPA	A	A	1 UNIT		1,982.50
		2	MOCHILA MOTOR STIHL	EPICENTRO	A	A	2 SET	646.00	1,292.00
		3	MAQUINA DE CURA :BERTHOUD OMEGA	JUAN RODRIGUEZ	A	A	1 SET		9,000.00
	ENTOMOLOGIA	4	HELADERA:WESTINGHOUSE	CENTRO ELECTRICO	A	A	1 SET		649.00
		1	AIRE ACONDICIONADO ELECTRA	BARRACA EUROPA	A	A	1 UNIT		1,982.00
		5	ESTANTE COLGANTE	ARTESANAL	A	A	3 SET	213.00	639.00
	SUELO Y RIEGO	6	MEDIDOR DE HUMEDAD DE SUELO EQUIPMENT CORP. TRASE system I	GRASS TECH	B	A	1 UNIT		10,512.00
		7	MEDIDOR DE FLUJO DE LIQUIDOS SOMLUYBERGER	SISTEMAS HIDRA	B	A	15 UNIT	49.00 +IVA	904.00
		8	ANALIZADOR DE SISTEMA RADICULAR DELTA T- DEVICES LTD. Type DTS-COMP	GRASS TECH	B	A	1 UNIT		13,517.00
1996	FITOPATOLOGIA	1	GENEAMP PCR SYSTEM 2400	METEC S.A.	A	A	1 UNIT		4,824.75
	CULTIVO	2	UNIDAD DE CRECIMIENTO	TECNICA DEL FRIO	B	B	1 UNIT		82,174.00
			INSTALACION	HUGO M.ALVES			1 UNIT		15,348.00
1997	FITOPATOLOGIA	1	HELADERA WARNING 320	CEDRO HOUSE	A	A	1 UNIT		850.00
		2	MESA DE CULTIVO	MONTAJES Y METAL	A	A	GICA 57		9,747.00
	ENTOMOLOGIA	3	COMPUTADOR	OFFICE 2000	A	A	1 UNIT		2,856.00
	CULTIVO	4	CAMARA DE FRIO	TECNICO DE FRIO	A	A	1 UNIT		67,305.00

1998	FITOPATOLOGIA	1	PERSONAL COMPUTER IBM APTIVA K6 LAXMARK INKJET 5000	OFFICE 2000	A	A	2	2,082	4,164
	CULTIVO	2	PRE-COOLING ROOM MONTAJES y METALURGICA DE SALTO S.R.L	M.M.S	A	A	1		17,800
		3	TAMANADOR DE FRUTA MODEL:CT80	MOSQUES S.R.L	B	A	1		22,100
		4	DATALOGGER HARVESTMASTER	GRASS-TECH	A	A	2	2,890	5,780
		5	FLUOROMETRO OPTI-SCIENCE, Inc	GRASS-TECH	B	A	1		15,230
		6	BINGB	CARLUPAY	B	A	40	27	1,080
		7	PALLET	CARLUPAY	B	A	80		512
		8	ESCALERA MONTAJES y METALURGICA DE SALTO S.R.L	M.M.S	B	A	6	424	2,544
	COMUN	9	ESTACION METEOROLOGICA CAMBELL SCIENTIFIC, Inc	GRASS-TECH	A	A	1SET		32,402
		10	TRACTOR VALMET 785 4X4FRUTERO	COMPANIA URUGUAYA S.A	A	A	1		22,171
		11	AUTO ELEVATOR TOYOTA 7FD15	AYAX S.A	B	A	1		14,507
	FITOPATOLOGIA	12	SPORE TRAP BURKARD 7-DAY RECORDING VOLUMETRIC	ELECO S.A	A	A	1		6,393.70
	CULTIVO	13	PERSONAL COMPUTER IBM APTIVA AF1DRY1 EPSON STYLUS850	OFFICE 2000	A	A	1		3,251
		14	MILLIPORE ACADEMIC Cod.JBRQ	POLIURUGUAY S.R.L	B	A	1		4,454

ANNEX 4

Local running cost

Overseas Technical Exchange Programme

The year of	Trip to	Name of people present	Period	Expenditure
1995	Argentine	Hiroyasu TANAKA Diego MAESO	1995.8.28～1996.9.13	¥726,000(US$7,385.56)
1996	Brazil	Hiroyasu TANAKA Koichi INOUE Keiichi ISHIKAWA Roberto BERNAL Ismael MULLER Alvaro OTERO Jose BUENAHORA Pagani CRISTINA	1996.10.5～1996.10.13	¥1,666,650(US$15,041.96)
1998	Argentine	Tsutomu SAKUMA Sei SAKURAI Roberto BERNAL Jose BUENAHORA	1998.10.5～1998.10.9	¥594,298(US$4,347.46)

Emergency Infrustructural Improvement Budget

1997	Construction of Netted Glass House	¥2,419,000(US$19,750.00)

ANNEX 5

Allocation of Budget in uruguay

(US$)

	Apr. 1995～Mar. 1996	Apr. 1996～Mar. 1997	Apr. 1997～Mar. 1998	Apr. 1998～Mar. 1999	TOTAL
Payment	142, 337. 32	137, 681. 84	182, 435. 22	123, 654. 47	586, 108. 85
Journey	5, 274. 12	7, 027. 75	6, 374. 35	8, 858. 24	27, 534. 46
Energy Electric	7, 489. 78	7, 235. 28	11, 072. 41	10, 350. 12	36, 147. 59
Fuel	5, 344. 27	9, 114. 24	13, 292. 08	9, 447. 98	37, 198. 57
Communication	4, 272. 82	5, 282. 18	7, 058. 91	5, 139. 34	21, 753. 25
Material	31, 652. 05	12, 467. 29	18, 235. 69	29, 866. 22	92, 221. 25
Maintenance	5, 954. 55	2, 068. 97	681. 19	493. 97	9, 198. 68
TOTAL	202, 324. 91	180, 877. 55	239, 149. 85	187, 810. 34	810, 162. 65

ANNEX 6

Dispatch of Team

Name of Team	Period	Liability	Name of Person
The Preliminary Survey	1994. 4.09～1994. 4.23	Leader·Phytopathology	Meisaku KOIZYMI
		Soil and Nutrition	Toyozi TAKATSUZI
		Cultivation	Yoshio YAMADA
		Planification	Shozi SHINO
		Coodinator	Koji OHTA
Long Term Survey	1994. 8.28～1994. 9.09	Plant Protection	Hiroyasu TANAKA
		Orchard Management	Keiichi ISHIKAWA
		Coodinator	Koji OHTA
Implementation Survey	1994.12.05～1994.12.22	Leader	Ryuji KORENAGA
		Plant Protection	Hiroyasu TANAKA
		Orchard Management	Toyozi TAKATSUZI
		Coodinator	Takayuki ANDO
Consultation Survey	1995. 8.05～1995. 8.20	Leader·Phytopathology	Akira KUDO
		Entomology	Masahiro YAMANAKA
		Orchard Management	Hiroshi DAITO
		Coodinator	Koji OHTA
Advisory	1996.11.23～1996.12.07	Leader·Entomology	Takeshi UJIIE
		Phytopathology	Takeshi KANO
		Orchard Management	Yoshiaki UMEMIYA
		Coodinator	Akemi INOUE
Advisory	1997.11.10～1996.11.24	Leader·Entomology	Takeshi UJIIE
		Phytopathology	Tsutae ITO
		Orchard Management	Toshio TAKAHARA
		Coodinator	Akemi INOUE

ANNEX 7

The name of Counterpart

	Name	The time of Disposition	The Place of Belonging
Disease Control	Roberto Bernal	1995. 3. 1	Salto Grande
	Diego Maeso	1995. 3. 1	Las Burjas
	Ana Bertalmio	1995. 3. 1	Salto Grande
	Cristina Pagani	1996. 2.12	Las Burjas
Insect Pest Control	Jose Buenahora	1995. 3.1	Salto Grande
	Enrique Lopez	1995. 4.26	Salto Grande
	Saturnino Nunez	1996. 9.16	Las Burjas
	Jorge Pauellier	1996. 6. 3	Las Burjas
Orchard Management	Ismael Muller	1995. 3. 1	Salto Grande
	Alvaro Otero	1995. 3. 1	Salto Grande
	Carmen Goni	1995. 3. 1	Salto Grande
	Fernando Carrau	1996.12.20	Salto Grande

ANNEX 8

ITEMIZED EVALUATION

1. **DISEASE CONTROL- I**

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
1. Fungal diseases on fruit (1) Disease occurrence	1) Clarify the kind and degree of damages on principal fruit diseases in Uruguay and know the important diseases necessary to control.	·Kind and occurrence of fruit diseases.	·Survey of diseases occurrence was performed at 23 citrus groves and packing-house in northwest area in Uruguay.	·Scab was the most important disease, melanose and greasy spot are also important. ·High precipitation at late growing seasons stimulate occurring Phytophthora fruit rot. ·Lesions of scab on fruit occurred naturally were quite different from those found in Japan.		·Completed
	2) Clarify the duration and main time of occurrence of scab and conclude the period during which control is necessary.	·Parts of overwinter of scab fungus and its infection period.	·Observation on natural infection of scab was performed.	·Natural infection of scab on Satsuma was recognized until end of February. Damage of fruits of Satsuma infected before middle of December was severe.		·Completed
			·Survey for the overwinter places of scab fungus.	·Overwinter parts of scab fungus on Satsuma, common mandarin and clementine were the lesion on the leaves. Fruits of Valencia orange maintain source of scab for next season.		
			·Disease development on leaves and fruits were observed	·Initial stage of disease developments on leaves and fruits are observed on Satsuma.	·Observations have to be done on other CVs.	·Complete at the end of Dec
			·Spore production abilities on the lesions were observed around the year	·Spore production abilities of the lesions on new and old leaves are detected around the year.		·Completed
	3) Clarify the influence of environmental factors on the occurrence of scab.	·Environmental conditions related with the occurrence of principal disease on fruit.	·Check the rainfall as the factor of diseases occurrence.	·Disease did not occurre on the tree covered with plastic film. Rain fall is the very important factor for disease occurrence.		·Completed
(2) Diagnosis and identification of causal agents	1) Clarify the biotype of E. fawcetti in Uruguay.	·Identification of the causal fungus of scab greasy spot and Phytophthora rot.	·Causal agents of scab were isolated.	·Several hundred isolates were obtained. Because of the quarantine problem, MGAP does not permit to send fresh samples abord for identification of Elsinoe australies. JICA side already transferred the technique and methodology for identification, PCR, using indicator plants etc.		·Completed
			·Clarify the existence of pathotype of E. fawcettii	·Two pathotype of E. fawcettii were detected by host range test. Florida wide host range (FWHR) Florida narrow host range (FNHR)		·Completed

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
(2) Diagnosis and identification of causal agents	2) Clarify the species of Mycosphaerella in Uruguay as a fungus of greasy spot.		・Causal agent of greasy spot was isolated.	・Isolates produces spores of imperfect stage, Stenella sp. Not yet succeeded to produce the perfect stage.	・Detection of perfect stage	・Methods for identification are already transferred. Continue this by C/P
	3) Clarify the species of Phytophthora on fruit rot of citrus.		・Causal agent of fruits rot was isolated.	・4 Phytophthora fungi were isolated from rot fruits in the field and packing house. ・3 of 4 isolates seems to be P. citrophthora, other one to be P. citricola	・Continue	
	4) Clarify the susceptibility of citrus varieties to scab and greasy spot.	Pathogenicity (host range) and lesion type of scab and greasy spot fungus on citrus cultivars.	・Susceptibilities of CVs to scab were observed in the field.	・Satsuma, Clementine, Common mandarin and Nova are susceptible to scab disease. Valencia and Navel are less susceptible.		・Completed
(3) Control measures	1) Confirm the effectiveness of dormant spray for the control of scab in the condition of Uruguay.	・Optimal time of fungicide application to scab.	・Application of some fungicides in dormant stage.	・Spraying benomyl, delan and score in dormant stage were very effective.		・Completed
	2) Clarify the timing and interval of fungicide application for the effective control of scab during growing season in the condition of Uruguay.		・Application of some fungicides in growing season	・Spraying at sprouting, pre-flowering, petal-fall and 15, 30, days after petal-fall were effective.		・Completed
	3) Clarify the existence and distribution of the resistant strain of the scab fungus to benzimidazole fungicides in citrus orchards in northwest region of Uruguay.	・Study on resistant strain of the scab fungus to benzimidazole fungicides.	・Test for benomyl resistance was performed on the scab fungus.	・Resistant strain of the scab fungus for benzimidazole fungicides distributed widely in Salto and Paysandu area		・Completed
	3) Establish the effective control program for scab in areas where the resistant strains of the fungus are distributed.		・New fungicides are tested	・Delan and Labilite are effective		・Completed
	4) Establish the effective control program for melanose.	・Application of alarm system to melanose control.	・Experiment on application of alarm system to melanose control was carried out.	・Manzate and copper sprays applied each 200 mm of rain gave very good results.		・Completed
	5) Confirm the effectiveness of pre-harvest spray for the control of post-harvest disease.	・Confirmation of the effectiveness of pre-harvest spray on post-harvest diseases.	・Applied fungicides on fruits at pre-harvest stage	・MGAP does not agree to use benzimidazol group chemicals used in Japan for this trials. As the other chemicals were used, the results were unstable.	・Check the effectiveness of Guazatine group chemicals.	・Methods for test are already transferred. Continue this by C/P.

I. DISEASE CONTROL - II

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
2. Virus and virus-like diseases (1) Study on occurrence and transmission	1) Clarify the relationship between the occurrence of psorosis and some other virus-like disease and the citrus cultivars in north-west region of Uruguay.	·Occurrence and damage of psorosis and other virus-like disease.	·Survey of disease occurrence in groves of north-west area	·Psorosis was the main virus problem.		·Completed
	2) Clarify the annual development on damages by psorosis in orchards and obtain the information on the existence of its vector.	·Transmission of psorosis	·Exposed the indicator plants under the affected tree. ·Indexing the neighboring tree of affected ones ·Rear the aphids on affected tree and move them on indicator plant.	·5 in 114 indicator plant showed symptoms. One of them was confirmed by bioassay. ·Development of the disease in the field are at random ·Until now, 43 healthy plants were exposed to aphid feeding. Symptoms did not appear yet	·Continue ·Continue ·Continue	·Techniques and methodology were transferred. Activities will continue by C/P.
	2) Clarify the possibility and importance on seed transmission of psorosis agent		·Seed of sweet orange collected from affected trees were indexing. ·Seed of rootstock CV, trifoliate, are indexed.	·1750 seedlings were indexed. They did not show any symptoms yet. ·Only 60 seedlings has been bioassyed. They don't showes the symptoms yet.	·Continue	·Completed ·Techniques and methodology were transferred. Activities will continue by C/P.
(2) Study on mild strain	1) Clarify the contamination of citrus tristeza virus and its damage on principal citrus CVs	·Survey on effective mild strain of citrus tristeza virus.	·Survey the samples from pomelo and other CVs. by following criteria. severe; severe damaged tree mild; light damaged tree slight; surrounded tree of severe damaged one	·Collected 53 samples. ·Some of them are contaminated with other viruses. All of them are under purification work.	·Clarify the pathogenecity.	·Techniques and methodology were transferred. Activities will continue by C/P.
	3) Obtain the effective mild strain of citrus tristeza virus from citrus cultivars which show severe damages of the disease.	·Confirmation of cross protection of mild strain of citrus tristeza virus to severe strain	Cancel: It takes long time (almost 10 years) to get the results			
(3) Management of virus free mother tree	1) Obtain the virus free materials of the high quality clones of the main citrus cultivars and to bring them to the foundation block.	·Production of plantlets by micrografting.	·Micrografting of main varieties and rootstocks.	·584 micrografts were obtained of 231 CVs. since 1995 ·431 virus free candidates seedlings were obtained	·Continue ·Continue	·Techniques and methodology were transferred. Activities will continue by C/P. ·Techniques and methodology were transferred. Activities will continue by C/P.

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
(3) Management of virus free mother tree	4) Establish the indexing system for virus free confirmation in the increasing block.	·Separate reservation of virus free mother tree.	·Plants confirmed to be virus free were planted and kept under insect free conditions.	·Virus free trees foundation block was established. 28 CVs and 69 rootstocks were maintained ·Increasing Block for virus free buds was established.	·Continue	·Techniques and methodology were transferred. Activities will continue by C/P.
		·Indexing for virus free confirmation in foundation and increasing block.	·Visual observation to detect virus symptoms and ELISA test for CTV were done.	·Manual for management of foundation and increasing block was prepared.		

2. INSECT PEST CONTROL - I

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
1. Forecasting technique for major pests (1) Identification and classification	1) Identify the main species of thrips.	·Collection of thrips and their identification.	·Specimens mounted in gum chloral were examined.	·The main species was confirmed as Frankliniella alliochroos.		·Completed
	2) Identify the main species of eriophyid mite.	·Collection of mites and their identification.	·Specimens mounted in gum chloral were examined.	·All of eriophyid mites collected from Valencia orange orchard were identified to be citrus rust mite, Phyllocoptruta oleivora.		
(2) Monitoring method	1) Clarify the annual trends of occurrence of major pests.	·Seasonal prevalence of thrips with yellow plate sticky trap and survey on percentage of fruit infested	·Seasonal prevalence were monitored with yellow plate sticky trap. ·The proportion of fruits infested was determined.	·Seasonal prevalence of main insect pests were ocumented. ·Effective sampling methods were almost clarified from four years results.		·Completed
		· Seasonal prevalence of occurrence of Califomia red scale with sex pheromone trap and survey on proportion of fruit infested.	·Seasonal prevalence were monitored with sex pheromone trap. ·The proportion of fruits infested was determined.			
		· Population densities of citrus rust mite with sampling of leaves and fruits, and survey on grade of their damages.	· Population densities of citrus rust mite were monitored by sampling of leaves and fruits. · The degree of their damages were studied.			
	2) Clarify the optimum timing of control for citrus whitefly.	· Analysis of the previous data of citrus whitefly in Uruguay.	· The biology and damages of citrus whitefly in Uruguay were analyzed by using the data collected from previous reports.	· Citrus whitefly is estimated to have three generations per year. · Peak of the adult emergence of first generation was observed at the beginning of November each year.		
	3) Clarify the annual trends of occurrence of citrus leafminer.	· Seasonal prevalence of citrus leaf miner and survey of injury.	· The proportion of leaves and shoots infested by citrus leafminer were determined.	· Damaged leaves were observed on the summer and autumn shoots.	· Confirmation of generations per year and hibernating stage.	· To be continued by C/P. Technique were transferred.
(3) Forecasting methods of occurrence	Develop forecasting methods of appearance time for thrips and California red scale.	· Survey on forecasting methods of appearance time of thrips. · Survey on forecasting methods of appearance time of California red scale.	· Occurrence of thrips and California red scale were studied by analysing the data collected from four yaers survey in the field.	· For the effective forecasting of the thrips, monitoring in flowering season (primary) and summer (secondly) should be impotant. · For the effective control of scales, appearence of first and second generations should be determined precisely.	· Survey and analysis are necessary to be continued.	· To be continued by C/P.

2. INSECT PEST CONTROL - II

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
2. Integrated control (1) Identification of natural enemies	1) Clarify the fauna of natural enemies for major pests.	· Collection of native natural enemies of thrips and their identification.	· Various natural enemies of main insect pests were collected periodically by beating method in citrus orchards. · Parasitoids of the California red scale were allowed to emerge and collected by keeping the fruits in the laboratory cage.	· Some predators were found in several citrus orchards. ex. :One species of tribe Serangiini (Coleop. Coccinellidae), Ceraeochrysa sp. (Neuroptera, Chrysopidae), Amblyseius brazilli (El-Banhawy) (Acari, Phytoseiidae)	· Identification of the species name of natural enemies which were not identified.	· Techniques were transferred.
		· Collection of native natural enemies of mites and their identification		· The phytoseiid mites, Amblyseius brazilli and A. inouei, and the predaceous insect of Stethorus sp. was the predator of mites.		
		· Collection of native natural enemies of California red scale and their identification.		· An important parasitoid of California red scale was confined as Aphytis melinus. · Two ladybird beetles of the tribe Serangiini and Microweiseini were confirmed as predators of California red scale.		
		· Collection of native natural enemies of citrus whitefly and their identification		· A ladyird beetle of the tribe Serangiini was confirmed as one of the predators of citrus whitefly.		
	2) Clarify the fauna of natural enemies.	· Collection and identification of native natural enemies of citrus leafminer.	· Parasitoids of citrus leafminer were allowed to emerge and collected by keeping the leaves which were infested by the leafminer in the rearing plastic bag in the laboratory.	· Cirrospilus sp. (Hymenoptera, Eulophidae) was confirmed as one of the parasitoids of citrus leafminer.	· Survey on native host of Cirrospilus sp. · Survey on another native parasitoid wasps.	· Should be continued by Uruguayan researcher. · Techniques were transferred.
(2) Integration of selective control measures	1) Clarify the role of native natural enemies.	· Survey on characteristic and effectiveness of natural enemies of California red scale and mites.	· Percent parasitism of some parasitic wasps of the California red scale and food habit of predators of mites were examined.	· California red scale was highly parasitized by Aphytis melinus in many orchards. · Considerable number of citrus rust mite were fed on by Amblyseius sp.	· Evaluation of th characteristics of natural enemies of California red scale and mites to clarify their effectiveness as the biological control agents.	· Techniques were transferred. To be continued by Urugayan researcher.
	2) Develop the utilization of selective pesticides for the control of main pests.	· Selection of selective chemicals for thrips, mites, scale insects and whitefly.	· Long-term effects of pesticide application on phytoseiid mites were examined for 11 chemicals by interval sampling after spray.	· Fenbutatin (acaricide) and CGA (IGR), Abamectin, Imidacloprid (insecticide) had low harmful effects on phytoseiid mites.		·Completed
	3) Obtain the basic data for IPM in the citrus orchards.	· Survey on major pests and natural enemies, and damage in test plot for selective control.	· The arthropod fauna were compared between the plots sprayed with selective and non selective insecticides.	· Both Aphytis melinus and phytoseiid mite were more abundant in the selective control plots than non-selective ones. · Effect of chemicals on natural enemies and scale insect was in analysis.		·Completed

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
(2) Integration of selective control measures	4) Develop the rational control system.	· Selection of selective chemicals for the leafminer.	· Effects of pesticide application on citrus leafminer were examined for 11 chemicals by interval sampling after spray.	· Abamectina was most effective for citrus leafminer, in the next place in Imidacloprid, Diflubenzuron cypermethrin.	· Selection of more effective insecticide.	· Techniques were transferred. To be continued by Uruguyan researcher.
		· Introduction, release and evaluation of exotic parasitoids.	· Talked about the possibility of introduction of exotic parasitoids.	· Had good prospects in introduction of exotic parasitoids.	· Introduction, release and evaluation of exotic parasitoids.	· Should introduce Ageniaspis citricola from Argentine. ·Corporation with the University is recommended.
(3) Appropriate control	1) Determine optimum timing of control for the thrips.	· Survey on progress about time of infestation by thrips.	· Oviposition habitat of thrips were observed. · The main part of infestation by the thrips was determined on Murcott from flowering to petal falling.	· The most vulnerable stages of Murcott for thrips should be from flowering to petal falling from the respect of fruit damage.		·Completed
	2) Establish the control methods of pest insects for main citrus cultivars.	· Citrus varietal difference of damage by thrips.	· The injury level by thrips were compared among five varieties of citrus in grower's orchards.	· The proportion of fruit infested by thrips was highest in Murcott, in the next place in Ellendale.		

3. ORCHARD MANAGEMENT- I

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
1. Improvement for tree Management (1) Stabilization of fruit settig	1) To establish the fruit thinning method and reduce the alternate bearing problem.	·Fruit thinning on Satsuma	·The experiments on Satsuma with hand thinning different L/F and different chemicals	·300ppm NAA and 20ppm Maxim resulted in good conc. of them for fruit thinning.	·Variability in large scale production areas produce difference between essay and large plot.	· Continued by C/P.
	2) To establish the physiological fruit drop problem by ringing.	·Promotion of fruit setting on Ellendale by ringing	·Two ringing trials were treated at different period.	·The best ringing period was before flowering and until 45 days after petal fall.	·Climatic conditions in the last 3 years appeared to overcome some of the alternate bearing characteristic of this variety .	·Continued by C/P.
	3) To introduce the pruning method for stable fruit production.	·Effect of different methods of pruning on Satsuma and Ellendale adult tree	· Light pruning in Ellendale	·Increased the light intensity in the inside of tree crown and the fruit growth.	·Different level of pruning	·Continued by C/P.
	4) To make plan of optimum planting density for improved yield of young tree.	·Tree management on different planting densities of Satsuma	·Complete management of young trees			·Continued by C/P.
(2) Control of Physiological disorders on fruit	1) To establish the control methods of creasing	·Control measure on creasing	·Applied GA_3, on Valencia orange ·Foliar application of Ca on Navel orange	·Percentage of creasing on the fruits applied 20 or 40 ppm of GA_3 were lower than those of untreated. ·Under data analysis, harvest has not been done yet.	·Further and more controlled essays have to be done in calcium relation ships on the fruit.	·Studies on GA_3 will be concluded. ·Studies in calcium and other mineral nutrients will be carry out by C/P.
	2) Control of physiological disorder in pre- and post-harvest	·Improvement of fruit handling during pre-harvest and post-harvest	·Valencia from two citrus areas and Ellendale from Salto were used ·$CaCO_3$ were applied at 3 different stages of Satsuma fruit before harvest.	·Evaluation shows the importance of wind scarring on the % of fruit discarded followed by bruises due to inadequate fruit handling. ·Decreased the % of puffing with the $CaCO_3$ application.	·Improvement of harvest of fruit (length of calix) and others. ·Puffing is problem in late season harvested Satsuma and other mandarins. Check the optimum harvesting period before coloring.	·Completed ·Continued by C/P.
		·Evolution of soluble solids/ acid ratio during cold storage	·Valencia orange and Satsuma mandarin were storaged in cold room.	·Ratio increased gradually but kept the solid soluble constantly.		·Completed
		· Control of pre-harvest drop and calyx life.	· Application of MCPB and 2, 4-D before harvest.	·MCPB kept calix at fruit a little lower than the effect of 2, 4-D.	· To eliminate 2, 4-D as a calix drop retardant and to substitute by MCPB to keep fruit on the tree and calix during cold room storage and cold damage.	· Continued by C/P.
		· Cold storage in large room	· Survey the air condition in large cold room in Packers.	·Air temperature were controlled well, but RH were not controlled and very high for the storage	· To control of RH in large room orange and mandarins	· Continued by C/P.

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
(2) Control of Physiological disorders on fruit	2) Control of physiological disorder in pre- and post-harvest.	·Preconditioning packed fruit	· Effect of 3 preconditioning times and 2 storage temps on Satsuma.	·Improved fruit taste after preconditioning for 10 days at room after cold storage	· Preconditioning practices are not used in Uruguay.	· Continued by C/P.
		· Control of green mold and cold damage in storage	· Effect of Brassinosteroid and two jasmonic derivative products on Clementine and Nova mandarins, stored at 2 temperatures.	·Lowered the occurence of green mold in cold storage	· Furthermore, they promote cold resitance and fruit decay protection.	· Continued by C/P.
(3) Determination of optimum time for harvest and yield prediction	1) Modeling fruit growth and quality for different cultivars	· Developing curvatures of fruits and the quality of five cultivars	· Data collected	· Drew figures of fruit development · Data collection for maturation index · Drew figures of fruit maturity index	· Relationship with climate variability will be done. · Weather variability will also included in the model in the final analysis.	· Continued by C/P.
	2) Relationship between phenology and fruit production for yield prediction	· Flowering and fruit yield	· Flowering and yield relationship have been done. · Data for yield and phenology are recorded in Satsuma and Navel.	·Clarfied the effect of rainfall on the physiological fruit drop and the fruit growth. ·Data analysis for 4 years	·Continue to collect data yearly.	·Continued by C/P.
(4) Fast methodology for cultivar evaluation	1) Early evaluation methods of cultivar in field	· Precocity with different grafting in the field	· Different methods of grafting for comparing of growth of grafted scions.			·Continued by C/P.

3. ORCHARD MANAGEMENT- II

Item	Activities planned	Brief description of work	Evaluation of the progress at the end of May '99	Progress until end of May '99	Items continuing	Final situation
2. Nutrition and water management (1) Characterization of fertilizer application	1) Technical recommendation on rate of global N and K fertilization. 2) Preliminaly N and K foliar level for maximum productivity and fruit quality	· Application of fertilizer at different rate of nitrogen and potassium	· Application of fertilyzer and general management of trees ·Harvest and fruit quality	· Data collect for yield and quality of fruits	· Establish the recommendation of fertilization for growers.	· Continued by C/P.
(2) Irrigation Scheduling	1) To obtain the basic data of the soil-plant water condition status	· Collected soil samplers from other type of soil	· Measuring	·Clarified the soil characters for water of collected soil.	·Clarify the soil character for water of another type of soil.	· Continued by C/P.
	2) To establish a productivity and economical evaluation of the main effect of the irrigation periods for Satsuma 3) To show the edaphic and physiological behavior 4) To give accurate criteria on irrigation timing of the citrus production for export	· Applied irrigation at different season	· Data collect and under data analysis	· Data collect for yield and quality of fruits ·Established the optimal time of irrigation for young trees.	·Check the needs of irrigation for adult trees and the methods.	· Continued by C/P.
	5) To establish the optimal level of soil water depletion requirement for growth stages.	· Applied water at different amount	· Data collect and under data analysis	· Data collect for yield and quality of fruits	· Data collect for yield and quality of fruits	· Continued by C/P.
	6) To know the advantages and weaknesses of the different systemes available 7) To obtain parameters of irrigation efficiency able to extrapolate for other type of soils. 8) To orientate growers to a better decision at the investment.	· Applied water with different irrigation equipments	· Data collect and under data analysis	· Different responses of tree development with different irrigation system.	·Data collect of the tree growth and productivity with different irrigation	· Continued by C/P.

ANNEX 9

Activities performed and evaluation of the activity by the expert's own

1. DISEASE CONTROL

Division	Theme	Activities performed	1st (95. 3-96. 2)	2nd (96. 3-97. 2)	3rd (97. 3-98. 2)	4th (98. 3-99. 2)	5th (99. 3-00. 2)	Evaluation by the expert's own
(1) Fungal diseases on fruit	① Disease occurrence	Kind and occurrence of fruit diseases	———	———	———			Completed
		Parts of overwinter of scab fungus and its infection period	———	———	———			Completed
		Environmental conditions related with the occurrence of principal diseases on fruit		———				Completed
	② Diagnosis and identification of causal agents	Identification of the causal fungi of scab, greasy spot and Phythophthora rot	———	———	———	———	———	Identification of the causal agent, greasy spot and Phytophthora rot, are incompleted. Activities will be continued by c/p.
		Pathogenicity (host range) and lesion type of scab fungus on citrus cultivars		———	———	———	———	Completed
	③ Control measures	Optimal time of fungicidal application to scab	———	———	———	———	———	Completed
		Study on resistant strain of scab fungus to benzimidazole fungicides		———	———			Completed
		Application of alarm system to melanose control	———	———	———	———		Completed
		Studies on the control methods for postharvest diseases.		———				The part of the item does not complete. Techniques and methodology were transfered, activities will be continued by c/p.

Division	Theme	Activities performed	1st (95. 3-96. 2)	2nd (96. 3-97. 2)	3rd (97. 3-98. 2)	4th (98. 3-99. 2)	5th (99. 3-00. 2)	Evaluation by the expert's own
(2) Virus and virus-like diseases	① Study on occurrence and transmission	Occurrence and damage of psorosis and other virus-like diseases						Completed
		Transmission of psorosis						The part of the item does not completed. Techniques and methodology were transfered, activities will be continued by c/p.
	② Study on mild strain	Survey on effective mild strain of citrus tristeza virus						The part of the item does not completed. Techniques and methodology were transfered, activities will be continued by c/p.
		Confirmation of cross protection of mild strain of citrus tristeza virus to severe strain.						At the midd-term evaluation, the item is canceled.
	③ Management of virus free mother tree	Production of plantlets by micrografting						Techniques and methodology were transfered, activities will be continued by c/p.
		Indexing for main viruses on plantlets obtained						Techniques and methodology were transfered, activities will be continued by c/p.
		Separate reservation of virus free mothe tree						Techniques and methodology were transfered, activities will be continued by c/p.
		Indexing for virus free confirmation in foundation and increasing blocks						Techniques and methodology were transfered, activities will be continued by c/p.

2. INSECT PEST CONTROL

Division	Theme	Activities performed	1st (95. 3-96. 2)	2nd (96. 3-97. 2)	3rd (97. 3-98. 2)	4th (98. 3-99. 2)	5th (99. 3-00. 2)	Self-estimation
(1) Forecasting technique for major pests	① Identification and classification	Collection of thrips and their identification						Completed
		Collection of mites and their identification						Completed
	② Monitoring method	Seasonal prevalence of occurrence of thrips with yellow platesticky trap and survey on rate of fruit infested						Transference of techniques was finished.
		Seasonal prevalence of occurrence of California red scale with sex pheromone trap and survey on rate of fruit infested.						Transference of techniques was finished.
		Population densities of citrus rust mite with sampling of leaves and fruits, and survey on grade of their damages.						Transference of techniques was finished.
		Analysis of already known data of citrus whitefly in Uruguay.						Completed
		Seasonal prevalence of occurrence of citrus leafminer and survey of injury						Transference of techniques was finished. Would be continued by Uruguayan researcher.
	③ Forecasting methods of occurrence	Survey on forecasting methods of appearance time of thrips.						The accumulation of data would be continued by Uruguayan Reseacher.
		Survey on forecasting methods of appearance time of California red scale.						The accumulation of data would be continued by Uruguayan Reseacher.

Division	Theme	Activities performed	1st (95. 3-96. 2)	2nd (96. 3-97. 2)	3rd (97. 3-98. 2)	4th (98. 3-99. 2)	5th (99. 3-00. 2)	Self-estimation
(2) Integrated control	① Identification of natural enemies	Collection of native natural enemies of thrips and their identification.						Transference of techniques was finished.
		Collection of native natural enemies of mites and their identification.						Transference of techniques was finished.
		Collection of native natural enemies of California red scaleand their identification.						Transference of techniques was finished.
		Collection of native natural enemies of citrus whitefly and their identification.						Transference of techniques was finished.
		Collection and identification of native natural enemies of citrus leaf-miner.						Transference of techniques was finished. Would be continued by Uruguayan reseacher.
	② Integration of selective control measures	Survey on characteristic and effectiveness of natural enemies of California red scale and mites.						Transference of techniques was finished. Would be continued by Uruguayan reseacher.
		Selection of selective chemicals for thrips, mites, scale insects and whitefly.						Transference of techniques was finished.
		Survey on major pests and natural enemies and damage in testplot for sel ective control.						Transference of techniques was finished.
		Selection of selective chemicals for the citrus leafminer.						Transference of techniques was finished.
		Introduction, release and evaluation of exotic parasitoids of citrus leaf-miner.						Introduction of exotic parasitoid was finished, but multiplication, release and evaluation would be unfinished.
	③ Appropriate control	Survey on progress about time of infestation by thrips.						Transference of techniques was finished.
		Citrus varietal difference of damage by thrips.						Transference of techniques was finished.

3. ORCHARD MANAGEMENT

Division	Theme	Activities performed	1st (95. 3-96. 2)	2nd (96. 3-97. 2)	3rd (97. 3-98. 2)	4th (98. 3-99. 2)	5th (99. 3-00. 2)	Expert's evaluation
(1) Improvement for tree management	① Stabilization of fruit setting	Fruit thinning on Satsuma						Transference of techniques was finished, would be continued by c/p. Completed.
		Promotion of fruit setting on Ellendale by ringing						Completed.
		Effect of different methods of pruning on Satsuma and Ellendale adult trees						Transference of techniques was finished, completed. However, sunburn damage by heavy solar radiation, impossible to direct introduction of Japanese management.
		Tree management on different planting densities of Satsuma						Would be continued by c/p.
	② Control of physiological disorders on fruit	Control measures on creasing						Transference of techniques was finished, would be continued by c/p.
		Improvement of fruit handling during pre- and postharvest						Would be conyinued by c/p.
	③ Determination of optimum time for harvest and yield prediction	Modeling fruit growth and quality for different cultivars						Completed.
		Relationship between phenology and fruit production for yield prediction						Completed.
	④Fast methodology for cultivar evaluation	Early evaluation methods of cultivar in field						Training in Japan.

Division	Theme	Activities performed	1st (95. 3-96. 2)	2nd (96. 3-97. 2)	3rd (97. 3-98. 2)	4th (98. 3-99. 2)	5th (99. 3-00. 2)	Expert's evaluation
(2) Nutrition and water management	① Characterization of fertilizer application	Nitrogen and potassium fertilization on Satsuma						Be continued independently.
	② Irrigation scheduling	Characterization of soil and plant water conditions						Be continued independently.
		Optimal time for water application						Completed.
		Optimal amount for water application						Completed.
		Evaluation of different irrigation systems						Completed.

ANNEX 10

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