別添資料

主要面談者リスト

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・Ms.Andrea de Fornasari	国際協力局 日本担当
国立農牧技術院（INTA）	
・Mr.Roberto Mario Bocchetto	総局長
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・Dr. Ana Maria Sadir	農牧獣医科学研究センター（CICVyA）所長
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専門家	
・小林喜六	本研究協力に派遣の長期専門家
通訳	
・澤田マリオ	

MINUTES OF THE MEETING
BETWEEN
THE JAPANESE EVALUATION TEAM
AND
THE ARGENTINE EVALUATION TEAM
ON
THE TECHNICAL COOPERATION PROJECT FOR
THE JOINT STUDY ON BIOLOGICAL CONTROL OF
SOIL-BORNE PLANT DISEASES
IN THE
ARGENTINE REPUBLIC

The Japanese Evaluation Team, (hereinafter referred as "the Japanese Team"), organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Hiroshi Nishiki, representative of JICA Japan, visited the Argentine Republic from March 22 to 26 2004, for the purpose of carry out the Final Evaluation jointly with the Argentine Evaluation Team (hereinafter referred to as "Argentine Team") concerning to the achievements for the Technical Cooperation Project for the Joint Study on Biological Control of Soil-Borne Plant Diseases (hereinafter "the Project") in the Argentine Republic.

During its stay in the Argentine Republic, the Japanese Team exchanged views and had a series of discussions about the evaluation of the Project with the Argentine Team. As a result of the discussions, both sides mutually agreed upon the matters referred to in the document attached hereto.

This text was prepared in Spanish and English, being both equally authentic. However, in case of any divergence of interpretation, the English text shall prevail.

Buenos Aires, March 26, 2004.

Mr. Hiroshi NISHIKI
Team Leader
Japanese Evaluation Team
Staff, South America Division,
Regional Department III
Japan International Cooperation Agency

Agr. Eng. Carlos Alberto CHEPPI
Team Leader
Argentine Evaluation Team
President
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Dr. Kiroku KOBAYASHI
Senior Technical Advisor
Japanese Evaluation Team
Chief Advisor of the Project

Dr. Ana SADIR
Senior Technical Advisor
Argentine Evaluation Team
Director
Agricultural and Veterinary Research Center
National Institute of Agricultural Technology

ATTACHED DOCUMENT

JOINT EVALUATION REPORT

ON

THE TECHNICAL COOPERATION PROJECT FOR

JOINT STUDY ON

BIOLOGICAL CONTROL OF SOIL-BORNE PLANT DISEASES

IN THE ARGENTINE REPUBLIC

CONTENTS

LIST OF ANNEX

USED ABBREVIATIONS

C/P:	Counterpart Personnel
INTA:	National Institute of Agricultural Technology
IMYZA:	Institute of Microbiology Zoology and Agriculture of INTA
JICA:	Japan International Cooperation Agency
PDM:	Project Design Matrix
PDMe :	Project Design Matrix for Evaluation
R/D:	Record of Discussions

The present Joint Evaluation Report is based on the Record of Discussions dated May 02, 2001, between Japan International Cooperation Agency (JICA) and the National Institute for Agricultural Technology of Argentina (INTA). The Joint Evaluation Committee (hereinafter referred to as the "Committee") , composed by the Japanese and Argentine Teams, was organized in order to review the overall performance of the Project, and the results are described as follows:

1. JOINT EVALUATION OF THE PROJECT

1.1 Objectives of the Evaluation

The objectives of the Evaluation are as follows:

(1) Evaluating the Project from the viewpoints of (a) Accomplishment of the Project, (b) Implementation Process and (c) Evaluation based on the Five Criteria (i.e. Relevance, Effectiveness, Efficiency, Impact and Sustainability)
(2) Identifying remaining problems and recommending necessary measures to be taken after the termination of the Project to the respective governments, and
(3) Considering the lessons drawn from the Project activities in order to reflect them on future projects in the interest of making them more effective and efficient.

1.2 Methodology of the Evaluation

The Joint Evaluation Committee analyzed the reports produced by the Project and made interviews with the Argentine counterpart personnel and Japanese long-term experts.

(1) Accomplishment of the Project
Accomplishment of the Project in terms of Project Purpose, Outputs and Inputs was assessed in comparison with the Project Design Matrix (PDM).

(2) Implementation Process
Implementation Process of the Project in terms of Activities was assessed in comparison with the Project Design Matrix (PDM) and research plans.

(3) Evaluation based on five Evaluation Criteria
The Project was evaluated based on the following five criteria:

1) Relevance
Relevance refers to the validity of the Project purpose and the overall goal in connection with the development policy of the Argentine government as well as the needs of beneficiaries.
2) Effectiveness
Effectiveness refers to the extent to which the expected benefits of the Project have been achieved as planned, and examines if the benefit was brought about as a result of the Project.
3) Efficiency
Efficiency refers to the productivity of the implementation process, examining if the inputs of the Poject was efficiently converted into the outputs.
4) Impact
Impact refers to direct and indirect, positive and negative impacts caused by the implementing the Project, including the extent to which the overall goal has been attained.

5) Sustainability
Sustainability refers to the extent to which the Project can be further developed by Argentina, and the benefits generated by the Project can be sustained under national policies, technology, systems and financial state.

1.2 Members of the Joint Evaluation Committee

(1)Japanese Evaluation Team

Name	Assignment	Occupation
Mr. Hiroshi NISHIKI	Leader	Staff, South America Division, Regional Department III (Latin America and Caribbean) JICA
Mr. Seiji KATO	Managerial Advisor	Deputy Resident Representative JICA Argentina
Dr. Kiroku KOBAYASHI	Senior Technical Advisor	Chief Advisor of the Project – JICA
Ms. Yasuyo HIROUCHI	Evaluation Analysis	Permanent Expert, International Development Associates Ltd.

(2) Argentine Evaluation Team

Name	Assignment	Occupation
Agr. Eng. Carlos Alberto CHEPPI	Leader	President INTA
Dr. Ana SADIR	Senior Technical Advisor	Director of Agricultural and Veterinary Research Center-INTA
Agr.Eng. Roberto E. LECUONA	Senior Technical Advisor	Project Supervisor Director of Institute of Agricultural Microbiology and Zoology – INTA
Dr. Laura GASONI	Technical Advisor	Team Leader of the Project Researcher of Institute of Agricultural Microbiology and Zoology – INTA

1.3 Schedule of the Evaluation

Date	Day	Activities
22 Mar	Mon	- Interview with the expert and counterpart members
23 Mar	Tue	- Joint Evaluation Committee Meeting (preparation) - Interviews with the expert and counterpart members
24 Mar	Wed	- Interview with experts and counterpart members - Final Report preparation
25 Mar	Thu	- Interview with the expert and counterpart members - Joint Evaluation Committee Meeting
26 Mar	Fri	- Joint Evaluation Committee Meeting (Signature of Final Report)

2. OUTLINE OF THE PROJECT

2.1 Background of the Project

Soil-borne plant diseases caused by *Rhizoctonia* and *Fusarium*, responsible of considerable economic loss in Argentina, had been well controlled by the use of soil sterilizers like methyl-bromide. However, the use of methyl-bromide will be banned by 2010 under the agreement reached during the Vienna Convention for the Protection of the Ozone" due to the negative effects to human health and ozone layer destruction identified by the "Montreal Protocol for Substances that Deplete the Ozone Layer" held in Viena in 1995.

In response to this situation, biological control of soil-borne plant diseases through the introduction of microorganisms has been studied extensively with some remarkable results. From 1994 to 2000, researchers from the of Institute of Agricultural Microbiology and Zoology (IMYZA) and JICA short-term experts carried out a joint study on biological control in Argentina, and as result, some beneficial microorganisms that showed the ability to control soil-borne diseases were selected and characterized.

To make maximum use of the results of the above technical cooperation, the Argentine Government submitted a request on the technical cooperation project for the joint study on biological control of soil-borne plant diseases as alternative to methyl bromide. Japanese government sent a preliminary study team to Argentina in September 2000. Based on the results of the preliminary study, both governments signed the R/D on the present Project in May 2001

2.2 Summary of the Project

According to the Project Design Matrix (PDM) attached to the R/D, the summary of the Project is as follows:

(1) Overall Goal:
A safety control method against the soil-borne plant disease are extended in Argentine.

(2) Project Purpose:
1) A biological control method against soil-borne plant diseases is developed.
2) A system, which identifies biological control agents and makes these agents practically usable, is established in Argentine.

(3) Output of the Project:
3) Effectiveness of various combinations of selected microorganisms to control plant diseases in the greenhouse and growths chamber is shown.
4) Effectiveness of the selected microorganisms in the naturally infected fields is shown.
5) The influence of biological control agents on existing microorganisms becomes clear.
6) The properties of selected microorganisms become clear
7) Effectiveness of the plant disease control programme without use of cehmical control agents is shown.

3. REVIEW OF THE PROJECT DESIGN MATRIX (PDM)

Prior to the evaluation, the Joint Evaluation Committee reviewed the initial (and the lates) PDM and agreed to make some corrections and modifications. Major points of corrections and modifications are described in Annex 1-1 and the modified PDM (PDM for evaluation: PDMe) is shown in Annex 1-2.

4. RESULTS OF THE EVALUATION

4-1 Accomplishment of the Project

It is expected that the Project Purpose, the Outputs and the Inputs will be fully accomplished by the end of the Project. Detailed analysis is shown in Annex 2 "Evaluation Grid (1) Accomplishment".

4-2 Implementation Process

In general, the Activities have been conducted according to the plan. Monitoring of the Project has been conducted periodically but it was not based on the PDM. The steering committee has not been organized officially but the committee members have met frequently in different occasions to exchange views on the Project. Detailed analysis is shown in Annex 3 "Evaluation Grid (2) Implementation Process".

4-3 Evaluation based on Five Criteria

(1) Relevance
The Project is considered to be highly relevant. In order to meet with an agreement, extension of safe methods to control plant diseases as alternatives to methyl bromide is essential. Sustainable agriculture is also a national policy. Developing biological control methods as alternatives to methyl bromide is relevant with needs of INTA and local farmers. Detailed analysis is shown in the first section ("Relevance") of Annex 4 "Evaluation Grid (3) Evaluation based on five evaluation criteria".

(2) Effectiveness
The Project is considered to have been highly effective. Effects of biological control methods have been proven positive. Techniques and knowledge related to selection of effective microorganisms, evaluation of their impacts on existing microorganisms, clarification of their properties as well as development of integrated plant disease control have been transferred and C/P have acquired sufficient capacity to conduct the related research by themselves. It is expected that the Project Purpose will be fully achieved by the end of the Project. Contribution of Outputs to the achievement of the Project Purpose is also found to be high. Detailed analysis is shown in the second section ("Effectiveness") of Annex 4.

(3) Efficiency
Judging from the achievement level of the Outputs, provision of Inputs has been conducted efficiently. In general, timing of provision, quality and quantity of both Japanese and Argentine Inputs have been adequate. In addition, the Project has made maximum use of preceding technical cooperation of JICA to IMYZA. Detailed analysis is shown in the third section ("Efficiency") of Annex 4.

(4) Impacts

The Overall Goal ("Safe control methods against the soil-borne disease will be extended in Argentina) of the Project is likely to be achieved several years after the end of the Project. In addition, the Project has already brought about and is expected to bring about various impacts. A private company that is interested in biological control has provided a financial support to IMYZA to cover the costs involved the field tests partially. Results of the Project have been published widely through international symposiums, domestic seminars, scientific magazines, etc. and have contributed to increasing technical knowledge of researchers in the concerned fields. Detailed analysis is shown in the fourth section ("Impact") of Annex 4.

(5) Sustainability

It is likely that the positive effects of the Project would be sustained after the end of the Project. From institutional points of view, biological control methods have policy and institutional supports. It is expected that the C/P will continue to be engaged in the relevant research. From financial viewpoints, it is expected that IMYZA through INTA will provide enough budget to carry out research and development of safe biological control methods. From technical points of view, capacity of C/P has been developed sufficiently to continue the related research by themselves. Biological control methods developed by the Project are expected to be utilized and disseminated by INTA. Detailed analysis is shown in the fifth section ("Sustainability") of Annex 4.

5. CONCLUSIONS

The Project has been carried out in a suitable manner and the Project Purpose is expected to be fully achieved by the end of the Project. Consequently, the Committee concludes that the Project should be terminated at the end of the period of 3 years, as originally planned in the R/D.

6. RECOMMENDATIONS

Through the Project, biological control methods against soil-borne plant diseases affecting flowers and vegetables grown in greenhouses, including microorganisms and integrated control techniques (i.e. solarization and reductive sterilization) have been developed. The techniques neccesary for development of the methods have been transferred to IMYZA.

Therefore, in future, it will be necessary to carry out extension activities for farmers to promote the use of the above methods as alternatives to methyl bromide. For this purpose, it will be required for IMYZA to continue the research / tests by applying the transferred techniques, to accumulate additional data for above microorganisms and techniques, and finally to obtain the product to be able to be used for commercial application.

In order to achieve the above, the following items are recommended:

1. In order to ensure the sustainable research activities by IMYZA, it is essential that INTA continue to provide financial and institutional policy supports to IMYZA.

2. In order to ensure the sustainable research activities, it is suggested that IMYZA not only depend on the budget allocated by INTA but also consider the means of generating additional income of their own by utilizing the techniques tansferred by the Project (eg.

provision of technical services, organization of technical workshops for universities or for other researchers), etc.

7. OTHER COMMENTS

There are a lot of problems in the fields of the agriculture in Argentina. Especially increase of soil-borne diseases and soil degradation caused by continuous cropping represented by the mono-culture of the soy bean and the cultivation without tillage have become serious.

In order to address the problems caused by continuous cropping, it is important to implement research on the analysis of the related microorganisms and control methods immediately. It is desirable that the results of the Project would be utilized for such research activities.

Annex 1－1: Major corrections and modifications made for the PDM for Evaluation

(Deleted words are shown as struck-lined and added ones as underlined)

1. **Overall Goal, Project Purpose and Outputs in general**: The tense of the sentences was changed from the present to the future.
2. **Overall Goal**: "A safety control method" was an editorial mistake and was corrected into "Safe control methods". The corrected sentence is "A ~~s~~Safe~~ty~~ control method**s** against the soil-borne plant disease ~~is~~ **will be** extended in Argentine**a**".
3. **Project Purpose**: The initial PDM had two Project Purposes and the second one ("A system, which identifies biological control agents and makes these agents practically usable, is enhanced in Argentine) was found to be a part of the first one ("A biological control method against soil-borne plant diseases is developed"). Therefore, the former was integrated into the latter. In addition, some editorial modifications were made in order to make the meaning of the sentence clearer. The modified sentence is "~~1. A~~ B~~b~~iological control method**s** against soil-borne plant diseases ~~is developed.~~2. **,including a** A system~~,~~ which identifies biological control agents and makes these agents practically usable, **will be developed** ~~enhanced~~ in Argentine**a**."
4. **Output 1**: The word "the selected" was deleted because it was found to be an editorial mistake. In addition, in order to make the meaning of the sentence clearer, the word "shown" was changed to "clarified" and the words "to select effective ones" were added to the end. The modified sentence is "Effectiveness of various combinations of ~~the selected~~ microorganisms to control plant diseases in the greenhouse and growths chamber ~~is~~ **will be** ~~shown~~ **clarified to select effective ones**".
5. **Output 2**: In order to make the meaning of the sentence clearer, the word "shown" was changed to "clarified" and the words "to identify potential biological control agents" were added to the end. The modified sentence is "Effectiveness of the selected microorganisms in the naturally infected fields ~~is~~ **will be** ~~shown~~ **clarified to identify potential biological control agents.**"
6. **Output 3:** In order to make the meaning of the sentence clearer, "the potential" was inserted between "influence of" and "biological control". In addition, the word "shown" was changed to "clarified" and the words "to identify safe ones" were added to the end. The modified sentence is "The influence of **the potential** biological control agents on existing microorganisms ~~become clear~~ **will be clarified.**
7. **Output 4:** In order to make the meaning of the initial sentence clearer, the words "selected microorganisms" were changed to "the potential biological control agents" and the words "become clear" were changed to "will be clarified". The modified sentence is "The properties of ~~selected microorganisms~~ **the safe biological control agents** ~~become clear~~ **will be clarified"**
8. **Output 5:** In order to make the meaning of the sentence clearer, it was modified into "Effectiveness of ~~the~~ **Integrated** plant disease control programme without use of ~~chemical control agents~~ **methyl bromide** ~~is shown~~ **will be clarified".** In addition, a footnote " In this context, "integrated plant disease control programme" means "combination of biological, physical and other control methods" was created.
9. **Outputs and Activities in general:** Logical relationship between Outputs and Activities were found to be inappropriate. Although each Output is supposed to have corresponding Activities, it was not a case in the initial PDM. The Activities had to be reorganized to show which Activity corresponds to which Output.

10. **Initial Activity 1**: Activity 1 was found to be a common activity for all the Outputs. It was put as the first activity of each Output (i.e. new 1-1, 2-1, 3-1, 4-1 and 5-1).

11. **Initial Activity 2**: Since Activity 2 was an activity to realize Inputs, it was deleted from the Activities.

12. **Initial Activity 3 (1)**: Since Activity 3(1) was found to be an activity for Output 1, it was renumbered as new 1-2. Since the first sentence was short of verb, the word "Implement" was added to the beginning. The word "selected" between "test of" and "microorganisms" was deleted because it was found to be a mistake. The second sentence was moved to a newly created footnote 2. The modified sentence is "**Implement** combination test of ~~selected~~ microorganisms on controlling plant growth chamber conditions. ~~Different types of combinations (including selected bacterial and fungal agents) will be prepared on seeds, roots or soils. Equipment and greenhouse must be ready before starting assays.~~" In addition, in order to reflect the actual activity, the new Activity 1-3 "Select effective microorganisms" was created.

13. **Initial Activity 3(2):** Since initial Activity 3 (2) was found to be an activity for Output2, it was renumbered as new 2-2. This activity consisted of three sentences, the second one of which was found to be the explanation of the first one in different words. The first two sentences were integrated into one. Integrated sentence is " **Implement combination** ~~experimentation~~ **tests** of **the** effective microorganisms to control plant disease in infected open field. Field treatments with different combinations of microorganisms on phytopathogenic fungi will be established. The third sentence " ~~Equipment must be installed before starting assays.~~" was deleted and moved to a newly created footnote 3. In addition, in order to reflect the actual activity, the new Activity 2-3 "Identify potential biological control agents" was created.

14. **Initial Activity 3(3):** Since initial Activity 3 (3) was found to be an activity for Output3, it was renumbered as new 3-2. This activity consisted of two sentences, the second one of which was found to be the explanation of the first one in different words. These sentences were integrated into one. Integrated sentence is "**Evaluate impact of the**~~study on the influence of~~ **the potential** biological control agents ~~for~~ on existing microorganisms. ~~Impact evaluation of application of previous microflora will be carried out~~".

15. **Initial Activity 3(4):** Activity 3 (4) consisted of two sentences, which were found to be two different activities for Output 4 (new 4-2 and 4-3). In order to make the meaning clearer, initial expression of new 4-2 was modified to "Identify the ~~microorganisms~~ **biological control** agents at the DNA level, and analyze these properties" and that of new 4-3 was modified to "Characterize different microorganisms included in selected formulations in order to determine the species ~~or~~ **and** biotypes of agents as well as metabolites produced. ~~Equipment must be installed before starting assays~~". The deleted sentence was moved to a newly created footnote 4.

16. **Initial Activity 3(5):** Initial Activity 3 (5) consisted of two sentences, which were found to be two different activities for Output 5 (new 5-2 and 5-3). Since both were short of verb Initial expression of new 5-2 was changed into " Implement ~~experimentation~~ **tests** on a ~~comprehensive protection program~~ **integrated plant disease control** using cleaning crops, solarization and biological control agents. ~~Cleaning crop will be used to avoid spread of diseases to different crops~~ " The deleted second sentence was move to a newly created footnote 5. The initial expression of new 5-3 was changed to "**Evaluate** ~~T~~the effect of solarization and colonization with beneficial microorganisms to reduce pathogen density ~~will be evaluated~~".

17. **Objectively Verifiable Indicators**: Some of them were corrected and new ones were added as shown in the PDMe in order to be made more measurable. Means of verification were also modified as appropriate.

Annex 1-2. PDM for Evaluation (1 /2)

Project Name: Joint Study Project on Biological Control of Soil-Borne Plant Disease
Period of Cooperation: 3 years (2001/6- 2004/5)
Implementing Agency: INTA-Instituto Nacional de Tecnologia Agropecuaria, IMYZA- Instituto de Microbiologia y Zoologia Agricola
JICA Department in charge: South America Division, Department of Latin America and the Caribbean

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall Goals Safe control methods against the soil-borne plant disease will be extended in Argentina.	1. Use of methyl bromide in Argentina will be eliminated 2. Biological control agents will be registered and produced	1. Statistics on use of fungicides. 2a.Statistics on use of control agents and agriculture 2b.Production records and registration records of biological control agents.	A.The government policy to eliminate the use of methyl bromide in Argentine by 2007 will not change. B. New diseases will not break out C.New chemical fungicide will not pose a hazard to the ozone layer and human health.
Project Purpose Biological control methods against soil-borne plant diseases, including a system, which identifies biological control agents and makes these agents practically usable, will be developed in Argentina.	1.Effect of biological control methods on soil-borne plant disease as alternatives to methyl bromide will be proven positive 2. Results of the study are presented at international and domestic symposiums, conferences, etc. annually or published by INTA as a bulletin on its web site. 3.Counterpart personnel (C/P) will acquire basic knowledge and skills to carry out research in the field of plant pathology by themselves.	1.Results of tests 2.Peports, presentations or publication on a website 3. Questionnaire, interview with J/E, C/P	A.The personnel and budget of IMYZA will not be reduced. B. The biological control agents are approved. C. Farmers will not object to using biological control agents D. The C/P continue to work in the related fields.
Output 1 Effectiveness of various combinations of microorganisms to control plant diseases in the greenhouse and growth chamber will be clarified to select effective ones.	1.Effective microorganisms to control plant diseases at the laboratory level will be selected.	1-5 Project reports on results of tests and analyses, questionnaire, Interview with J/E, C/P	A Climate in Argentine does not change drastically. B. The C/P continue to stay in the related institution of the Project.
2 Effectiveness of the selected microorganisms in the naturally infected fields will be clarified to identify potential biological control agents.	2. Effective microorganisms to control plant diseases at the field level will be identified as potential biological control agents.		
3 The influence of the potential biological control agents on existing microorganisms will be clarified.	3.Report(s) on effect of the potential biological control agents on existing microorganism composition, plant diseases, and yield will be prepared by the end of the Project		
4 The properties of the potential biological control agents will be clarified	4. Report(s) on the properties (DNA construction) of the potential biological control agents will be prepared by the end of the Project.		
5. Effectiveness of integrated plant disease control programme[1] without use of methyl bromide will be clarified.	5 Report(s) on effect of integrated control programme against soil-borne plant diseases will be prepared by the end of the Project.		

[1] In this context, "Integrated plant disease control programme" means "combination of biological, physical and other control methods".

Activities	Inputs	Assumptions
1-1 Prepare study schedule. 1-2 Implement combination tests of microorganisms on controlling plant growth chamber conditions[2]. 1-3 Select effective microorganisms 1-4 Publish study results 2-1 Prepare study schedule. 2-2 Implement combination tests of the effective microorganisms to control plant disease in infected open field[3]. 2-3 Identify potential biological control agents 2-5 Publish study results 3-1 Prepare study scheduled 3-2 Evaluate impact of the potential biological control agents on existing microorganisms. 3-3 Publish study results 4-1 Prepare study schedule 4-2 Identify the biological control agents at the DNA level, and analyze these properties. 4-3 Characterize different biological agents included in selected formulations in order to determine the species and biotypes of agents as well as metabolites produced[4]. 4-4 Publish study results 5-1 Prepare study schedule 5-2 Implement tests on a integrated plant disease control programme, using cleaning crops, solarization and biological control agents[5]. 5-3 Evaluate effect of solarization and colonization with beneficial microorganisms to reduce pathogen density. 5-4 Publish study results	**Japanese side:** 1. Dispatch of Japanese Experts Long-term expert(s) and short-term experts 2. Training of Argentine counterpart personnel in Japan 3. The expenses necessary for the implementation of the Project 4. Equipment necessary for the implementation of the Project **Argentine side:** 1. Assignment of counterpart personnel and other necessary staff members 2. Office and necessary equipment for the Project 3. Necessary expenses for the implementation of the Project.	A. The counterpart personnel will continue to stay in the related institution of the Project Preconditions: None

[2] Different types of combinations (including selected bacterial and fungal agents) will be prepared on seeds, roots or soils. Equipment and greenhouse must be ready before starting assays.
[3] Equipment must be installed before starting assays
[4] Equipment must be installed before starting assays
[5] Cleaning crop will be used to avoid spread of diseases to different crops

Annex 2: Evaluation Grid (1) Accomplishment

(By the end of the Project) Grade*: A=Expected to be accomplished, B=Expected to be mostly accomplished, C=Expected to be partly accomplished

<table>
<tr><th>Items</th><th>Indicators as per PDMe</th><th>Sources</th><th>Methods</th><th>Results (as of March 2004)</th><th>Grade</th></tr>
<tr><td>Overall Goal</td><td>1. Use of methyl bromide in Argentine will be eliminated.</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>2. Biological control agents will be registered and produced.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Project Purpose</td><td>1. Effect of biological control methods on soil-borne plant disease as alternative to methyl bromide will be proven positive.</td><td>Results of tests</td><td>Review of the documents</td><td>Effects of biological control methods, including both introduction of microorganisms and integrated approach, have been proven positive. The methods have been found effective not only in vitro but also in the fields. Especially, effect of combination of microorganisms and solarization has been steady.</td><td>A</td></tr>
<tr><td></td><td>2. Results of the study are presented at international and domestic symposiums, conferences, etc. or published by INTA as a bulletin on its web site.</td><td>Project reports</td><td>Review of the documents</td><td>In total, 21 scientific reports have been published, including 11 original papers and 5 presentations at international symposiums, conferences, etc. and 5 presentations at domestic seminars.

Table 1: Number of papers, presentation
<table>
<tr><th>Year</th><th>Original papers at international symposiums, etc.</th><th>Presentation at international symposiums, etc.</th><th>Presentation at domestic seminars, etc.</th></tr>
<tr><td>2001</td><td>3</td><td>3</td><td>0</td></tr>
<tr><td>2002</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>2003</td><td>7</td><td>2</td><td>4</td></tr>
<tr><td>Total</td><td>11</td><td>5</td><td>5</td></tr>
</table>
(For details, please see Annex A)</td><td>A</td></tr>
<tr><td></td><td>3.Counterpart personnel (C/P) will acquire basic knowledge and skills to carry out research in the field of plant pathology by themselves. .</td><td>J/E, C/P</td><td>Interviews</td><td>Judging from the fact that all the C/P are now able to write original papers both in Spanish and English, they have already acquired basic knowledge and skills to carry out research by themselves after the completion of the Project.</td><td>A</td></tr>
<tr><td>Output 1</td><td>1. Effective microorganisms to control plant diseases at the laboratory level will be selected.</td><td>Project reports, J/E, C/P</td><td>Review of the documents, interviews</td><td>By pot tests in a greenhouse, four kinds of microorganisms with high disease suppressive effects have been selected for field tests. (For information, prior to the commencement of the Project, with assistance of the JICA short-term experts dispatched from 1994-2000, twenty (20) kinds of microorganisms with high antagonistic ability and survivability had been selected by tests on petri-plates and in carriers from approximately 300 kinds of microorganisms isolated from the roots of various plants and soil. By pot tests, four (4) kinds of microorganisms with high antagonistic ability and survivability had been further selected).

Table 2: Effective microorganisms at laboratory level
<table>
<tr><th>Type of micro-organisms</th><th>Number of kinds</th><th>Name</th></tr>
<tr><td>Bacteria</td><td>3</td><td>1. Pseudomonus fluorescens
2. Bacillus Cereus
3. Bacillus pumilus</td></tr>
<tr><td>Fungi</td><td>1</td><td>1.Trichoderma spp.</td></tr>
</table></td><td>A</td></tr>
</table>

(Readers are advised that Grades are indicated to help readers' understanding of the results, and they are not objective indicators such as points)

Annex 2: Evaluation Grid (1) Accomplishment

(By the end of the Project) Grade*: A=Expected to be accomplished, B=Expected to be mostly accomplished, C=Expected to be partly accomplished

<table>
<tr><th>Items</th><th>Indicators as per PDMe</th><th>Sources</th><th>Methods</th><th>Results
(as of March 2004)</th><th>Grade</th></tr>
<tr><td>Output 2</td><td>2. Effective microorganisms to control plant diseases at the field level will be identified as potential biological control agents.</td><td>-do-</td><td>-do-</td><td>By field tests, three (3) of the four microorganisms selected in Output 1 have been identified as potential biological control agents.

Table 3: Potential biological control agents
<table><tr><th>Type of micro-organisms</th><th>Number of kinds</th><th>Name</th></tr><tr><td>Bacteria</td><td>2</td><td>1. Bacillus Cereus
2. Bacillus pumilus</td></tr><tr><td>Fungi</td><td>1</td><td>1.Trichoderma spp.</td></tr></table></td><td>A</td></tr>
<tr><td>Output 3</td><td>3. Report(s) on effect of the potential biological control agents on existing microorganism composition, plant diseases, and yield will be prepared by the end of the Project.</td><td>-do-</td><td>-do-</td><td>Analyses on the effects of the three potential biological control agents on existing microorganisms composition, etc. are ongoing. Four presentations have been made at the domestic seminars. One more is expected to be published in the end of March.</td><td>A</td></tr>
<tr><td>Output 4</td><td>4. Report(s) on the properties (DNA construction) of the biological control agents will be prepared by the end of the Project.</td><td>-do-</td><td>-do-</td><td>A preliminary analysis on the properties of Trichoderma spp. has been completed and an original paper published already. It is expected that final characterization will be completed by the end of the Project. As for the other two agents (i.e. Bacillus Cereus, and Bacillus pumilus), original papers on the properties had been published by the C/P prior to the commencement of the Project with a help of a JICA short-term expert.</td><td>A</td></tr>
<tr><td>Output 5</td><td>5 Report(s) on effect of integrated control programme against soil-borne plant diseases will be prepared by the end of the Project.</td><td>-do-</td><td>-do-</td><td>Two types of integrated control (i.e. soil deductive sterilization; and combination of biological control agents and solarization) . So far, both have been found effective. Original papers have been published already.</td><td>A</td></tr>
</table>

(Readers are advised that Grades are indicated to help readers' understanding of the results, and they are not objective indicators such as points)

Annex 2: Evaluation Grid (1) Accomplishment

(By the end of the Project) Grade*: A=Expected to be accomplished, B=Expected to be mostly accomplished, C=Expected to be partly accomplished

<table>
<tr><th>Items</th><th>Plan as per PDMe</th><th>Sources</th><th>Methods</th><th>Results (as of March 2004)</th></tr>
<tr><td>Input</td><td>Japanese side</td><td></td><td></td><td></td></tr>
<tr><td></td><td>1. Dispatch of Japanese long-term expert(s) and short-term experts</td><td>Project reports</td><td>Review of the reports</td><td>(1)Long-term experts: One expert in the fields of Biological Control /Chief Advisor has been dispatched. (For details, please see Annex B-1)

(2)Short-term experts: In total, twelve (12) experts have been dispatched in the following fields: Plant Pathology (1 person), Biological Control (4 persons), Soil Microorganism (4 persons), and Plant Pathology/Biological Control (3 persons). (For details, please see Annex B-2)

Table 2: Dispatch of short-term experts by the Japanese fiscal year (April-March)<table><tr><td>Year</td><td>2001</td><td>2002</td><td>2003</td></tr><tr><td>Persons</td><td>3</td><td>3</td><td>6</td></tr></table></td></tr>
<tr><td></td><td>2. Training of Argentine counterpart personnel in Japan:</td><td>-do-</td><td>-do-</td><td>In total, four (4) counterpart personnel have been trained in Japan in the fields of Soil Microorganism (1 person) and Plant Pathology/Biological Control (3 persons). (For details, please see Annex B-3)

Table 3:C/P training by the Japanese fiscal year (April-March)<table><tr><td>Year</td><td>2001</td><td>2002</td><td>2003</td></tr><tr><td>Persons</td><td>0</td><td>3</td><td>1</td></tr></table></td></tr>
<tr><td></td><td>3. The expenses necessary for the implementation of the Project</td><td>-do-</td><td>-do-</td><td>Approximately 1,0350,000 yen has been disbursed as local expenses. (For details, please see Annex B-4)

Table 4:Provision of local costs by the Japanese fiscal year (April-March)<table><tr><td>Year</td><td>2001</td><td>2002</td><td>2003</td></tr><tr><td>Yen</td><td>3,480,000</td><td>3,450,000</td><td>3,420,000</td></tr></table></td></tr>
<tr><td></td><td>4. Equipment necessary for the implementation of the Project</td><td>-do-</td><td>-do-</td><td>The machinery and equipment worth approximately 29,480,000 Japanese yen in total have been provided, including biolog microstation system, low temperature incubator, ultrafreezer, autoclave, vertical freezer, growth chamber, vehicles, image analyzer microscope, etc. (For details, please see Annex B-5)

Table 5:Provision of equipment and machinery by the Japanese fiscal year (April-March)<table><tr><td>Year</td><td>2001</td><td>2002</td><td>2003</td></tr><tr><td>Yen</td><td>29,480,000</td><td>-</td><td>-</td></tr></table></td></tr>
</table>

(Readers are advised that Grades are indicated to help readers' understanding of the results, and they are not objective indicators such as points)

Annex 2: Evaluation Grid (1) Accomplishment

(By the end of the Project) Grade*: A=Expected to be accomplished, B=Expected to be mostly accomplished, C=Expected to be partly accomplished

<table>
<tr><th>Items</th><th>Plan as per PDMe</th><th>Sources</th><th>Methods</th><th>Results (as of March 2004)</th></tr>
<tr><td>Inputs</td><td>Argentine side</td><td></td><td></td><td></td></tr>
<tr><td></td><td>1. Assignment of counterpart personnel and other necessary staff members</td><td>Project reports</td><td>Review of the reports</td><td>Following counterpart personnel has been assigned:
(1) Research Supervisor (1 person from IMYZA)
(2) Team Leader/Researcher in the field of Biological Control of Plant Disease (1 person from IMYZA)
(3) Research Manager/Researcher in the field of Fermentation (1 person from IMYZA)
(4) Researchers in the field of Plant Pathology (1 person from Buenos Aires University and the other two from Cordoba University)
(5) Researchers in the field of Microbiology/Plant Pathology (1 person from IMYZA)
(6) Researcher in the field of Statistical Analysis (1 person from IMYZA)

(For details, please see Annex C-1)</td></tr>
<tr><td></td><td>2. Office and necessary equipment for the Project</td><td>-do-</td><td>-do-</td><td>Office space for the long-term expert has been provided. Necessary equipment such as desks, chairs etc. has made available for the Project.</td></tr>
<tr><td></td><td>3. Necessary expenses for the implementation of the Project</td><td>-do-</td><td>-do-</td><td>Annual budget of INTA for the Project allocated has been as follows;

Table 6:Provision of local expenses by the Argentine fiscal year (Jan-Dec)<table><tr><td>Year</td><td>2001(6~12)</td><td>2002</td><td>2003</td><td>2004(1~3)</td></tr><tr><td>Arg.peso</td><td>31,130</td><td>76,900</td><td>110,580</td><td>29,520</td></tr></table>
(For details, please see Annex C-2)</td></tr>
</table>

(Readers are advised that Grades are indicated to help readers' understanding of the results, and they are not objective indicators such as points)

Annex 3: Evaluation Grid (2) Implementation Process

Abbreviation: C/P-counterpart personnel J/E-Japanese expert

Item	Source	Method	Evaluation
1-1 Progress of Activities			
(1) Activities under Output 1	Project report, C/P, J/E	Review of report, questionnaire, interviews	Overall: Activities under output 1 have been implemented according to the plan and have been completed already. 1-1 The study schedule was completed in the beginning of the Project. 1-2 Pot tests on different types of combinations of four microorganisms, three bacteria (*Pseudomonus fluorescens, Bacillus Cereus and Bacillus pumilus*) and one fungi genus (*Trichoderma spp*), have been conducted in a greenhouse. 1-3 All the tested microorganisms have been found effective. 1-4 Results of the effectiveness of the selected microorganisms have been published in an international seminar.
(2) Activities under Output 2	-do-	-do-	Overall: Activities under output 2 have been implemented according to the plan and have been completed already. 2-1 The study schedule was prepared in the beginning of the Project. 2-2 Filed tests on different types of combinations of the effective microorganisms have been conducted. Especially, significant yield promotion of lettuce tested with *Pseudomonas fluorescens* and *Bacillus pumilus* was obtained. 2-4 Three potential biological control agents have been identified. (Although *Pseudomonas fluorescens* was effective in the field test, it was found out that its disease suppressive ability of decreased in the stock culture 2-5 Results of the effectiveness of the potential biological control agents have been published in an international journal, etc.
(3) Activities under Output 3	-do-	-do-	Overall: Activities under Output 3 have been implemented according to the plan. Although the planned activities have been completed, additional tests to confirm the results on soils of different field soils are ongoing. It is expected that the additional tests will be completed by the end of the Project. 3-1 The study schedule was prepared in the beginning of the Project. 3-2 Impacts of the potential biological control agents and different types of their formulation on existing microbial communities have been evaluated in naturally infected field plots in Tucuman. Additional analyses in the plots in other places are ongoing. 3-3 Results have been published at domestic seminars.
(4) Activities under Output 4	-do-	-do-	Overall: Activities under Output 4 have been implemented according to the plan and have been mostly completed. It is expected that all the activities will be completed by the end of the Project. 4-1 The study schedule was prepared in the beginning of the Project. 4-2 Identification of *Trichoderma spp.* at the DNA level has been conducted. Biochemical, physiological, morphological and cultural properties have been identified in order to determine species or biotypes. Preliminary identification has been completed. Finalization of the results are underway and is expected to be completed by the end of the Project. For the other two agents, identification had been completed prior to the commencement of the Project under technical guidance of a JICA short-term expert. 4-3 Characteristics of *Trichoderma spp.* included in peat moss formulation have been analyzed. For the other two agents, analyses had been completed prior to the commencement of the Project under technical guidance of a JICA short-term expert. 4-4 Results have been published in an international seminar.

Annex 3: Evaluation Grid (2) Implementation Process

(5) Activities under Output 5	-do-	-do-	Overall: Activities under Output 5 have been implemented mostly according to the plan. 5-1 The study schedule was prepared in the beginning of the Project. 5-2 Integrated programmes using biological control agents, solarization and reductive sterilization have been tested in the naturally infected field plots in Cordoba. Clearing crops have not been used because their import has not yet been approved by the Argentine Government. 5-3 Effect of solarization and colonization with beneficial microorganisms has been evaluated. 5-4 Results have been published in an international seminar.
2 Monitoring	C/P, J/E,	Interviews	The Project has been monitored by the Chief Advisor and the Project Suprevisor on daily basis and countermeasures have been taken promptly whenever there were problems. The Project has been closely monitored by JICA office in Argentina through meeting with Chief Advisor two–three times a month. An activity report of the Chief Advisor has been submitted once a year, describing the annual progress and achievement, problems to be solved, and a plan for the next year. The report has been prepared through interviews and exchanges opinions with C/Ps. Although the steering committee has not been organized, the committee members have been informed of the progress of the Project through JICA office, IMYZA and various seminars

Abbreviation: C/P-counterpart personnel J/E-Japanese expert

1. RELEVANCE:

Item	Source	Method	Evaluation
1.1 Overall Goal			
(1) Relevance with the needs of the Argentine Republic.	C/P, J/E. policy document	Questionn aire, interviews	The Overall Goal is relevant with the needs of Argentina. Soil-borne plant diseases caused by *Rhizoctonia* and *Fusarium* are widely spread and are responsible for considerable economic loss in Argentina. They have been controlled by the use of soil sterilizers such as methyl bromide. However, the use of methyl bromide will be banned by under an agreement reached during the "Vienna Convention for the Protection of the Ozone" due to its negative effects on human health and ozone layer destruction. Promotion of safety control methods that are alternatives to methyl bromide is an urgent need for Argentina.
(2) Relevance with the national policies	C/P, J/E policy document	Questionn aire, interviews, review of the document	The Overall Goal is relevant with the national policies. The Argentine government ratified the Vienna Convention in 1990 (Law 23.724), the Montreal Protocol in 1990 (Law 23.778) and the revisions of London and Copehnague in 1992 and 1995 respectively. It is a national commitment to eliminate the use of methyl bromide as plant disease control agent. In addition, the objective of the Secretariat of Agriculture, Livestock, Fishery and Alimentation (SAGPYA), the Ministry of Economy and Production in the field of Agriculture is to generate actions that contribute to the adoption of systems of agricultural production based on the sustainable use of natural resources.
1.2 Project Purpose			
(1) Relevance with organizational needs of INTA	C/P, J/E	Questionn aire, interviews	The missions of IMYZA are to implement research with microorganisms and other organisms of agricultural interests and to develop technology in order to (1) improve agricultural productivity without detriment to the environment or human and (2) to reduce the contamination of the agricultural production and the environment. The Project Purpose is relevant with the needs of IMYZA.
(2) Relevance with the needs of local beneficiaries	C/P, J/E	Questionn aire, interviews	Since the use of methyl bromide will be banned in 2007 in Argentina, the need of local farmers for alternative methods to control plant disease control is high. The Project Purpose is highly relevant with the local needs.
1.3Project Design	C/P, J/E, PDM	Questionn aire, interviews, review of PDM	Logical relationship among the components of the PDM was found generally appropriate. However, there were two Project Purposes and the second one was found to be a part of the first one. the former was integrated into the latter. The Activities had to be reorganized in order to make the logical relationship with the Outputs clear. In addition, some editorial modifications had to be made in order for the experts, their C/Ps, and other people concerned to clearly understand what the descriptions meant.

2. EFFECTIVENESS :

Items	Source	Methods	Evaluation
2.1 Achievement level of Project Purpose	Accomplishment grid, technical reports, C/P, J/E	Review of the documents, questionnaire, interviews	Biological control methods, including introduction of microorganisms and integrated control programme, have been developed. Relevant techniques have been transferred to the C/P and they have acquired basic knowledge and techniques to conduct the related research by themselves after the end of the Project. It is expected that the Project Purpose will be achieved by the end of the Project.
2.2 Contribution of the Outputs	-do-	-do-	
(1) Output 1	-do-	-do-	Output 1 has been achieved already and has contributed to the achievement of the Project Purpose. Four microorganisms that are effective at laboratory level have been selected by pot tests. The relevant techniques, including formulation of biological control agents such as seed coating and selection of best carriers, have been transferred to the C/P.
(2) Output 2	-do-	-do-	Output 2 has been achieved already and has contributed to the achievement of the Project Purpose. From the four effective microorganisms selected in Output 1, three potential biological control agents have been identified by field tests. The relevant techniques have been transferred to the C/P. The results were published in an International Journal.
(3) Output 3	-do-	-do-	Output 3 has been mostly achieved Using Biolog Microstation System, which was introduced into Argentina (and South America) for the first time, assessment of soil microbial community has been carried out by carbon source utilization of bacteria. So far, negative impacts of the potential agents on the existing community have not been observed. Additional evaluation on soils of different fields is ongoing to confirm the results. It is expected that Output 3 will be achieved by the end of the Project and will contributed to the achievement of the Project Purpose.
(4) Output 4	-do-	-do-	Output 4 has been mostly achieved. The properties of one potential biological control agent have been identified preliminarily. Finalization is underway. For the other two agents, identification had been completed prior to the commencement of the Project with a help of a JICA short-term expert. It is expected that Output 4 will be achieved by the end of the Project and will contribute to the achievement of the Project Purpose.
(5) Output 5	-do-	-do-	Output 5 has been achieved already and has contributed to the achievement of the Project Purpose. Integrated disease control programmes using biological control agents, solarization and reductive sterilization have been developed. Solarization and reductive sterilization have been effective independently Combination of biological control agents and solarization has been also found effective as alternatives to methyl bromide, depending on the environmental conditions.

Annex 4:Evaluation Grid (3) Evaluation based on Five Criteria

3. EFFICIENCY:

Items	Source	Methods	Evaluation
3.1 Achievement level of Outputs in relation to Inputs	Accomplishment grid, technical reports, C/P, J/E	Review of the documents, questionnaire, interviews	Judging from the achievement level of the Outputs, provision of Inputs has been conducted efficiently.
3.2 Inputs (utilization, timing, quality and quantity)	Accomplishment grid, C/P, J/E, field survey	Review of the grid, questionnaire, interviews, observation	
(1) Japanese side	-do-	-do-	
(a) Long-term expert	-do-	-do-	The long-term expert has been dispatched according to the plan. The quality, technical field, and experience are appropriate to achieve the Outputs. However, it would have been even more efficient if one more expert in the field of Epidemiology had been dispatched.
(b) Short-term expert	-do-	-do-	Short-term experts with relevant technical levels and fields have been dispatched in timely manner. However, due to time constraint, the experts mainly worked with the C/P at IMYZA so that they did not have enough time to transfer techniques to the C/P at Cordoba University. Although it did not adversely affect achievement of the Outputs, it would have been more efficient if the duration of dispatch of each expert had been longer.
(c) C/P training	-do-	-do-	The C/P training in Japan has been implemented according to the plan. Fields, contents and quality of the training were also appropriate. The C/P have been fully utilizing the knowledge and techniques they learned in Japan.
(d) Local costs for the Project activities	-do-	-do-	Local costs for the Project activities have been disbursed in time.
(e) Equipment and machinery	-do-	-do-	All the equipment and machinery were provided in the first year of the Project, which has facilitated smooth implementation of the Project. Since the provided equipment and machinery are essential to carry out the relevant studies, they have been fully utilized. In particular, Biolog Microstation System, which was introduced into Argentina (and South America) for the first time, has made assessment of soil community possible in a short period. However, in the case of Cordoba University, only a microscope and a datalogger have been provided. It would have been useful if PH meter, growth chamber, etc. had been provided additionally.
(2) Argentine side			
(a) C/P personnel	Accomplishment grid, C/P, J/E	Review of the grid, questionnaire, interviews	Quality, quantity and technical fields of the C/P were appropriate.
(b) Office & equipment	-do-	-do-	Although office space for the long-term expert has been provided at Fermentation Process Laboratory of IMYZA in timely manner, the provided room was too small. In addition, supply of electricity has not been sufficient to operate the provided machinery and equipment.
(c) Running expenses	-do-	-do-	Due to economic crises in Argentina, INTA was not able to provide sufficient expenses (i.e. budget for experimental materials, etc.) for the Project. However, it did not affect negatively the implementation of the Project because the budget for the experimental materials has been complimented by JICA local cost.
3.3 Coordination with Other Japanese or International Projects			The Project has made maximum use of the results of the preceding technical cooperation of JICA to IMYZA

Annex 4:Evaluation Grid (3) Evaluation based on Five Criteria

4. IMPACT:

Items	Source	Methods	Evaluation
4.1 Impact at Overall Goal level			
(1) Expected achievement of Overall Goal	Accomplishment *grid*, technical reports, C/P, J/E	Review of the documents, *questionnaire*, interviews	It is likely that the Overall Goal would be achieved several years after the end of the Project. With applying the acquired knowledge and experience, it is expected that IMYZA will be able to develop safe biological control agents and integrated plant disease control programmes (using solalization and reductive sterilization) that will be registered with SENASA. Now, IMYZA is in an appropriate position to attract private companies interested in manufacturing biological control agents and to promote the application of new practices.
4.2 Other impacts			
(1) Institutional impact	C/P, J/E	Questionnaire, interviews	Positive institutional impacts have been observed already. Recognizing the effectiveness of the methods developed by the Project, a private company that is interested in biological control has provided a financial support to IMYZA to cover the costs involved in the field tests at Tucuman partially. In addition, Cordoba University has become more interested in biological control of plant diseases and has approved a new research project initiated by the C/P.
(2) Economic impact	-do-	-do-	No economic impacts have been observed so far since the biological control methods developed by the Project have not yet reached to the stage of commercialization. However, once commercialized, it is expected that the methods would contribute to better crop yields and would therefore bring about increased income to farmers. In addition, the methods could be utilized in organic farming. Since the prices of organic crops are higher, income of the farmers are expected to increase as well.
(3) Technical impact	-do-	-do-	Technical impacts have been significant. The C/P as well as IMYZA have acquired sufficient capacity to continue research on biological control methods by themselves. In addition, IMYZA has organized a one-week technical seminar in collaboration with Salamanca University of Spain and Buenos Aires University on biological control, utilizing the knowledge and techniques acquired through the Project. One of the C/P has also introduced the techniques at training courses at INTA and SAGPYA. Methods and techniques developed and transferred through the Project have been wildely published in domestic seminars, international symposiums, etc..These activities have contributed to increasing the technical knowledge of participants and readers (i.e. researchers, students, etc.).
(4)Environmental impact	-do-	-do-	Biological control methods have been developed as alternatives to methyl bromides. Since they have not been commercialized yet, no environmental impacts have been observed so far. However, once commercialized, it would have considerable positive impacts on the natural environment as well as the human health.
(5) Social impact	-do-	-do-	The results of the Project have been widely published in seminars, symposiums, magazines and newspapers, etc., which have contribute to raising social awareness on sustainable agriculture using biological control methods.

5. SUSTAINABILITY:

Items	Source	Methods	Evaluation
5.1 Institutional Aspects			
(1) Policy support	C/P, J/E	Questionnaire, interviews	The Argentine government ratified the Vienna Convention in 1990 (Law 23.724) and the Montreal Protocol in 1990 (Law 23.778) It is a commitment of the government to eliminate use of methyl bromide by 2007. It is also a national policy to promote sustainable agriculture. Policy supports for development and promotion of biological control methods are expected to continue.
(2) C/P personnel	-do-	-do-	It is expected that the C/P will continue to engage in research in the relevant fields at INTA, Cordoba University and Buenos Aires University.
(3) Management capacity of IMYZA	-do-	-do-	IMYZA has managed various research programmes, including this Project, properly; it is assumed that it has sufficient management capacity to carry on the related research by themselves after the end of the Project.
(4) Coordination with other organizations	-do-	-do-	IMYZA has already established collaborative relationship with Cordoba University, Buenos Aires University and some private companies for development of biological control methods.
5.2 Financial Aspects	-do-	- do-	INTA was established by Article 16 of Decree Law 21.680 of December 4 of 1956, ratified by the Law No. 14.467. It became an autonomous agency on August 15, 2000 by the Law 25.641. Since then, INTA has been entitled to receive 0.5% of import duties for its activities. It is expected that IMYZA will able to secure sufficient budget to support the research activities related to biological control. In addition, there is a possibility to obtain funds from private companies that are interested in research and development of biological control agents.
5.3 Technological Aspects			
(1) Technical capacity	Technical reports, C/P, J/E	Review of the reports, questionnaire, interviews	The C/P have already acquired enough capacity to apply knowledge and techniques transferred through the Project and to continue the related research by themselves after the end of the Project.
(2) Utilization and dissemination of techniques by INTA	Technical reports, C/P, J/E	-do-	It is expected that the methods developed and the techniques transferred by the Project would be utilized by IMYZA. Integrated control methods developed by the Project (i.e. solarization and reductive sterilization) are relatively simple and low-cost for local farmers. Dissemination could be done through INTA experiment stations.
(3) Utilization of machinery and equipment	-do-	-do-	The provided equipment and machinery are essential to carry out research of biological control and would be utilized fully by IMYZA after the end of the Project. The C/P would be able to operate and maintain the equipment and machinery properly.

Annex A-1
List of Scientific Report and Original Papers

Date of Publication	Name of Literature or Journal / Volume / No./ Page	No. of Achievement	Title and Authors	Publishers
2001	Plant Disease 85, p.96	1	First Report of *Rhizoctonia solani* AG-4 on *Epipremmum aureum* in Buenos Aires, Argentina. E.R. Wright and P.E. Grijalba, L. Gasoni.	American Phytopathological Society
2001	Plant Disease 85, p.1287	2	First Report of *Rhizoctonia solani* AG-HG-II on Garden Pink in Buenos Aires, Argentina. E.R. Wright, M.C. Rivera, K. Asciutto, L. Gasoni.	American Phytopathological Society
2001	Journal of Plant Disease and Protection 108, p.530-535	3	Yield Response of Lettuce and Potato to Bacterial and Fungal Inoculants Under Field Conditions in Cordoba (Argentina). L. Gasoni, J. Cozzi, K. Kobayashi, V. Yossen, G. Zumelzu, S. Babbitt, N. Kahn.	Eugen Ulmer GmbH & Co.
2003	Plant Disease 87	4	First Report of Petunia Root Rot Caused by *Rhizoctonia solani* in Argentina. E.R. Wright, M.C. Rivera, K. Asciutto, L. Gasoni, V. Barrera, K. Kobayashi.	American Phytopathological Society
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.53	5	Biocontrol Agents and Mechanisms Involved. L. Gasoni, K. Kobayashi, A. Vicario, B. Stegman de Gurfinkel, J. Cozzi.	JICA Joint Study Project
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.81	6	Temporal Relationships of Inoculum Formulation to Density, Viability and Biocontrol Effectiveness of *Trichoderma harzianum*. J. Cozzi, L. Gasoni.	JICA Joint Study Project
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.124	7	Effectiveness of Strains of *Trichoderma spp*. in Softwood Chips as Biocontrol and Plant Growth Promoting Agent in Eggplant. S. Babbitt, Raul Zapata.	JICA Joint Study Project
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.148	8	Characterization of Fungal Biocontrol Agents and Pathogens from Soil. V. Barrera, S. Babbitt, M.C. Martinez.	JICA Joint Study Project
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.162	9	Efficiency of Solarization and Biocontrol Agents to Improve Yield Promotion on Table Beet (*Beta vulgaris*). G. Zumelzu, V. Yossen, K. Kobayashi, L. Gasoni.	JICA Joint Study Project
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.167	10	Soil Reductive Sterilization, an Alternative to Methyl Bromide, in Cordoba. V. Yossen, G. Zumelzu, K. Kobayashi, L. Gasoni.	JICA Joint Study Project
2004	Proceedings of the International Seminar on Biological Control of Soilborne Plant Diseases p.187	11	Statistical Utilities Supporting Biolog MicroStation System. N. Kahn, K. Yokoyama, L. Gasoni, G. Chiessa, K. Kobayashi.	JICA Joint Study Project

Annex A-2
Presentations in Congress/ International Symposium

Date	Name of Congress	No. of Achievement	Title and Authors	Place of Congress
2001.8.	Fitopatologia Brasileira	12	Determinación de la Concentración Inhibitoria Mínima de Diferentes Terpenos sobre *Rhizoctonia solani* y *Trichoderma harzianum*. E. Lucini, V. Yossen	Brazil
2001.8.	Fitopatolia Brasileira	13	Primera Cita de *Rhizoctonia solani* AG-4 sobre Pensamiento, Clavelina y Gazania en Buenos Aires, Argentina. E.R. Wright, K. Asciutto, M.C. Rivera, L. Gasoni.	Brazil
2001.8.	Fitopatologia Brasileira	14	Utilización de Aislamientos de *Trichoderma*, Desarrollados sobre Tarugos de Madera en el Control de *Rhizoctonia solani* en Berenjena. S. Babbitt, L. Gasoni, V. Lopez, V. Barrera.	Brazil
2003.2.	8th International Congress of Plant Pathology	15	Efficiency of Solarization and Biocontrol Agents to Improve Yield Promotion on Table Beet (Beta vulgaris). V. Yossen, G. Zumelzu, L. Gasoni, J. Cozzi, K. Kobayashi, S. Babbitt, V. Barrera, N. Kahn.	New Zealand
2003.2.	8th International Congress of Plant Pathology	16	Rhizoctonia Root Rot of Olive Trees in Argentina. V. Barrera, D. Barreto, B. Perez, M. Roca, S. Naito, K. Kobayashi.	New Zealand

Annex A-3
Domestic Seminar

Year	Presentation Title	Date and place	Period	Participants
2001	Applying Alternative Methods and Population Analysis for Durable Resistance to Soil-Borne Plant Diseases N. Kondo	2001.10.3. (INTA-IMYZA)	1 day	approximately: 40 participants
2001	Diversity and Structure Analysis on Complexity in Soil Microbial Community with the BIOLOG MicroStation System K. Yokoyama	2001.11. (INTA-IMYZA)	1 day	approximately: 40 participants
2002	The first Structural Analysis on Soil Microbial Community of Tobacco Cultivated Fields in Tucuman Using *the BIOLOG System* K. Yokoyama	2002.4. (INTA-IMYZA)	1 day	approximately: 40 participants
2002	Alternative Control of Soil-Borne Plant Diseases in Argentina for its Sustainable Food Production L. Gasoni	2002.8.2. (Fac. of Agr., Hokkaido Univ.)	1 day	
2002	Fungi and Plant Growth Promoter and Disease Suppressor M. Hyakumachi	2002.11.1. (INTA-IMYZA)	1 day	approximately: 40 participants
2003	Resultados Preliminares de un análisis estructural de Comunidades Microbianas de Suelos N. Kahn	2003.6. (National Univ. of Santiago del Estero)	3 days	
2003	Índice de Biodiversidad para Comunidades Microbianas del Suelo N. Kahn	2003.10. Mendoza	3 days	
2003	Monitoreo de la Diversidad Microbiana por medio de Perfiles de Carbono L. Gasoni	2003.11. Mar del Plata	3 days	
2003	Proyecto de Cooperación Técnica: El Control Biológico de las Enfermedades de las Plantas para el Desarrollo de una Agricultura Sustentable K. Kobayashi	2003.11.29. La Plata	1 day	approximately: 50 participants
2003	Molecular Ecology – New Technology to Study of Soilborne Plant Pathogens – K. Kageyama	2003.12.1 (INTA-IMYZA)	1 day	approximately: 40 participants

Annex A-4
Others (Newspapers and Magazines)

Date	Name of Newspaper or Magazine	Title and Author	Idiom
2001.11.20	La Plata Japanese Newspaper No. 7111, p.4	Future Prospects of Argentina (I) K. Kobayashi	Japanese
2001.11.22	La Plata Japanese Newspaper No. 7112, p.4	Future Prospects of Argentina (II) K. Kobayashi	Japanese
2002.1.	Nippon Shoko Kaigisho-Annual Report in Argentina No. 19, p.23-25	Joint Study on Biological Control of Soil-Borne Plant Disease - Its Present Status and Future Prospects K. Kobayashi	Japanese
2002.2.	Hokkaido Newspaper (Report)	K. Kobayashi	Japanese
2002.7.	New Country p.62-63	Agricultural Circumstances in Argentina K. Yokoyama	Japanese
2002.3.26	Gacetilla de Prensa No. 103/2002	Asistencia técnica y económica del Japón	Spanish
2002.12.4.	Ámbito Financiero p.18	Apoyo de Japón en investigaciones	Spanish
2002.12.9.	Ámbito Financiero	Desarrollan proyecto ambiental con Japón	Spanish
2002.12.10	La Cooperación p.16	Avances en un proyecto del INTA con aportes del gobierno del Japón	Spanish
2002.5.	Boletín INTA informa No. 181	Detectan causas del marchitamiento del tabaco	Spanish
2002.12.	Boletín INTA informa No. 211	Detectan microorganismos útiles para controlar enfermedades radiculares	Spanish
2003.1.	Revista Super Campo p.86	Acuerdo en Favor de la Ciencia	Spanish
2003.1.28	Noticias JICA Argentina	Urgent Report from Argentina K. Kobayashi	Japanese
2003.9.6.	La Nación Campo (Sección 5), p.15	Pautas básicas para el desarrollo de una agricultura sustentable K. Kobayashi	Spanish

Annex B-1
List of Dispatch of Japanese Experts(Long and Short term)

Year	No.	Name	Term	Research Fields	Organization	Contents
2001	1	Kiroku Kobayashi	2001.6.26 ~ 2004.6.25	Biological Control	Instituto de Microbiología y Zoología Agrícola (IMYZA) - INTA	Chief Advisor of biological control of soilborne plant diseases
2001	2	Norio Kondo	2001.9.10 ~ 201.10.7	Plant Pathology, Biological Control	Graduate School of Agriculture, Hokkaido University	Biolgical control by using non-pathogenic *Fusarium*
2001	3	Kazunari Yokoyama	2001.10.9 ~ 2001.12.7	Soil Microorganism	Division of Upland Field, Hokkaido Agricultural Research Center	Diversity of soil microorganisms based on Biolog System
2002	1	Kazunari Yokoyama	2002.3.31 ~ 2002.4.28	Soil Microorganism	Division of Upland Field, Hokkaido Agricultural Research Center	Diversity of soil microorganisms based on Biolog System
2002	2	Norio Kondo	2002.9.10 ~ 2002.10.8	Plant Pathology, Biological Control	Graduate School of Agriculture, Hokkaido University	Isolation of *Fusarium* and biological control by using non-pathogenic *Fusarium*
2002	3	Mitsuro Hyakumachi	2002.10.10 ~ 2002.11.6	Biological Control	Faculty of Agriculture, Gifu University	Biological control by using PGPF
2002	4	Kazunari Yokoyama	2002.12.8 ~ 2002.12.22	Soil Microorganism	Division of Upland Field, Hokkaido Agricultural Research Center	Data analysis of Biolog System
2003	1	Koji Kageyama	2003.10.23 ~ 2003.12.4	Plant Pathology Biological Control	Research Center of Basin Science, Gifu University	Molecular and biological identification and control of *Pythium*
2004	1	Shigeo Naito	2004.3.16 ~ 2004.3.24	Plant Pathology	Graduate School of Agriculture, Hokkaido University	Special lecture on taxonomy and control of *Rhizoctonia*
2004	2	Norio Kondo	2004.3.16 ~ 2004.3.24	Biological Control	Graduate School of Agriculture, Hokkaido University	Special lecture on cleaning crop
2004	3	Mitsuro Hyakumachi	2004.3.16 ~ 2004.3.24	Biological Control	Faculty of Agriculture, Gifu University	Special lecture on PGPF
2004	4	Shigehito Takenaka	2004.3.16 ~ 2004.3.24	Biological Control	Division of Upland Field, Hokkaido Agricultural Research Center	Special lecture on biological control of *Pythium*
2004	5	Kazunari Yokoyama	2004.3.16 ~ 2004.3.24	Soil Microorganism	Division of Upland Field, Hokkaido Agricultural Research Center	Special lecture on diversity of soil microorganisms based on Biolog System

Annex B-2
Record of C/P Training

Year	No.	Name	J-No.	Term	Course Field	Organization	Research
2002	1	Laura Gasoni	J0210525	2002.6.25 ~ 2002.8.20	Soil Microorganism	Division of Upland Field, Hokkaido Agricultural Research Center	Research on Biolog System
2002	2	Viviana Barrera	J0210162	2002.6.25 ~ 2002.9.3	Plant Pathology, Biological Control	Graduate School of Agriculture, Hokkaido University	Research on isolation and biological control of *Rhizoctonia* and *Fusarium*
2002	3	Silvana Babbitt	J0210524	2002.11.17~ 2002.12.21	Plant Pathology, Biological Control	Faculty of Agriculture, Gifu University	Research on biological control by using PGPF
2003	1	Viviana Yossen	J0320927	2003.9.3 ~ 2003.10.4	Plant Pathology, Biological Control	Division of Upland Field, Hokkaido Agricultural Research Center	Research on *Rhizoctonia* and *Fusarium*

Annex C-1
Allocation of C/P

Name		Area of specialization	Post	Trainee period in Japan	Name of experts which conducted the technological transfer	Work period in the project
1	Roberto Lecuona	Project Supervisor	Director of IMYZA		Kiroku Kobayashi	2003.11.~Present
2	Laura Gasoni	Team Leader/Researcher in the field of Biological Control	Formal staff of INTA	2002.6.25 ~ 2002.8.20	Kiroku Kobayashi Norio Kondo Kazunari Yokoyama Mitsuro Hyakumachi Koji Kageyama	2001.6.~Present
3	Jorge Cozzi	Project Manager/Researcher in the field of Fermentation	Formal staff of INTA		Kiroku Kobayashi Norio Kondo Kazunari Yokoyama Mitsuro Hyakumachi Koji Kageyama	2001.6.~Present
4	Silvana Babbitt	Researcher in the field of Plant Pathology	Formal staff of UBA	2002.11.17 ~ 2002.12.21	Kiroku Kobayashi Mitsuro Hyakumachi Norio Kondo Kazunari Yokoyama Koji Kageyama	2001.6.~Present
5	Viviana Yossen	Researcher in the field of Plant Pathology	Formal staff of Cordoba University	2003.9.3 ~ 2003.10.4	Kiroku Kobayashi Norio Kondo Mitsuro Hyakumachi Kazunari Yokoyama Koji Kageyama	2001.6.~Present
6	Guillermo Zumelzu	Researcher in the field of Plant Pathology	Part-time staff of Cordoba University		Kiroku Kobayashi Norio Kondo Mitsuro Hyakumachi Kazunari Yokoyama Koji Kageyama	2001.6.~Present
7	Viviana Barrera	Researcher in the field of Microbiology/Plant Pathology	Research study staff	2002.6.25 ~ 2002.9.3	Kiroku Kobayashi Norio Kondo Koji Kageyama Kazunari Yokoyama Shigeo Naito	2001.6.~Present
8	Nancy Kalin	Researcher in the field of Statistical Analysis	Formal staff of INTA		Kiroku Kobayashi Kazunari Yokoyama	2001.6.~Present

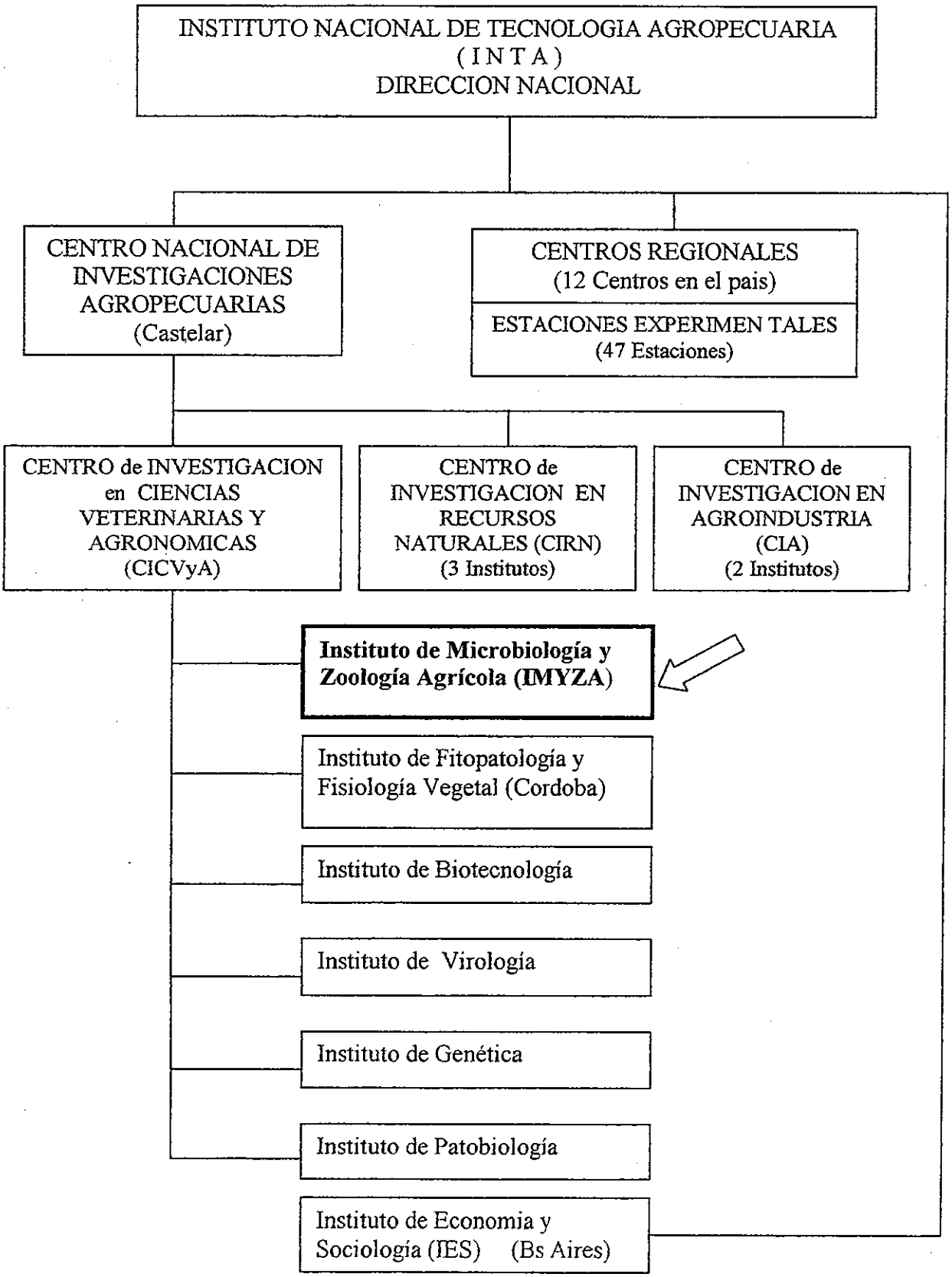
Annex C-2
Running expenses
Budget of local cost by the Argentine side

Denomination: Argentine Peso

Year / Items	2001 (6~12)	2002 (1~12)	2003 (1~12)	2004 (1~3)	Total
Personnel	29,400	69,600	96,600	26,400	**222,000**
Insurance of vehicle	0	3,000	7,200	2,400	**12,600**
Fuels of vehicle	0	250	350	220	**820**
Traveling allowance of C/P	0	0	0	0	**0**
Employment expenses of drivers	0	0	0	0	**0**
Commission of the costum	650	700	850	0	**2,200**
Maintenance expenses of the equipment	0	0	0	0	**0**
Communication cost (Tel/Fax)	180	850	1,080	150	**2,260**
Expenses for light and fuel	900	2,500	3,800	350	**7,550**
Expenses for meetings	0	0	0	0	**0**
Others	0	0	0	0	**0**
Expenses for participation in congress	0	0	700	0	**700**
Provision of land, building and facilities	0	0	0	0	**0**
Total	**31,130**	**76,900**	**110,580**	**29,520**	**248,130**

ANNEX D-1

ORGANIZATION CHART OF INTA - IMYZA



MINUTAS DE REUNION
ENTRE
LA COMISION JAPONESA DE EVALUACION
Y
LA COMISION ARGENTINA DE EVALUACION
PARA
EL PROYECTO DE COOPERACION TECNICA PARA
EL ESTUDIO CONJUNTO DEL BIOCONTROL DE
ENFERMERDADES FUNGICAS
RADICULARES

La Comisión Japonesa de Evaluación (en adelante "la Comisión Japonesa"), organizado por la Agencia de Cooperación Internacional del Japón (en adelante "JICA") y liderado por el Sr. Hiroshi NISHIKI, representante de JICA Japón, visitó la Argentina los días 22 al 26 de Marzo de 2004, con el propósito realizar la Evaluación Final, en forma conjunta con la Comisión Argentina de Evaluación (en adelante "la Comisión Argentina"), en todo lo concerniente a los logros del Proyecto de Cooperación Técnica para el Estudio Conjunto del Biocontrol de Enfermedades Fúngicas Radiculares en la Republica Argentina.

Durante su estadía en la Argentina, la Comisión Japonesa intercambio opiniones y tuvo una serie de discusiones sobre la evaluación del Proyecto con la Comisión Argentina. Como resultado de dichas discusiones, ambas partes acordaron sobre los tópicos correspondientes descritos en los documentos adjuntos a la presente.

El presente ha sido preparado en idioma inglés y español, siendo ambos igualmente auténticos. No obstante, en caso de divergencias en la interpretación, prevalecerá el texto en inglés.

Buenos Aires, 26 de marzo, 2004.-

Mr. Hiroshi NISHIKI
Líder
Comisión Japonesa de Evaluación
Staff, División Sudamérica
Departamento Regional III
Agencia Internacional de Cooperación
del Japón

Ing. Agr. Carlos Alberto Cheppi (Ms)
Presidente
Instituto Nacional de Tecnología Agropecuaria

Dr. Kiroku KOBAYASHI
Asesor Técnico Senior
Comisión Japonesa de Evaluación
Asesor Jefe del Proyecto

Dra. Ana SADIR
Líder
Comisión Argentina de Evaluación
Directora
Centro de Investigación en Ciencias
Veterinarias y Agronómicas
Instituto Nacional de Tecnología Agropecuaria

DOCUMENTOS ADJUNTOS

INFORME DE EVALUACION CONJUNTA

PARA EL

PROYECTO DE COOPERACION TECNICA PARA

EL ESTUDIO CONJUNTO

DEL

BIOCONTROL DE ENFERMERDADES FUNGICAS RADICULARES

EN LA REPUBLICA ARGENTINA

INDICE

LISTA DE ANEXOS

ABREVIATURAS USADAS

C/P:	Personal de la contraparte
INTA:	Instituto Nacional de Tecnología Agropecuaria
IMYZA	Instituto de Microbiología y Zoología Agraria - INTA
JICA:	Japan International Cooperation Agency
PDM:	Marco Lógico del Proyecto (Project Design matrix)
PDMe	Marco Lógico del Proyecto para la Evaluación
R/D:	Memorandums de Reuniones (Records of Discussions)

El presente Informe de Evaluación está basado en el documento "Record of Discussions" fechado 02 de mayo 2001, entre la Agencia de Cooperación Internacional del Japón (JICA) y el Instituto Nacional de Tecnología Agropecuaria (INTA) .
El Comité Conjunto de Evaluación fue organizado con el objeto de evaluar el performance general del Proyecto y los resultados se describen a continuación.

2. 1. EVALUACION CONJUNTA DEL PROYECTO

1.1 Objetivos de la Evaluación

Los objetivos de la evaluación son los siguientes:

1) Evaluar el Proyecto desde el punto de vista de a) Logros del Proyecto, b) Proceso de Implementación, c) Evaluación basado en los cinco criterios (Por ej. : relevancia, Efectividad, Eficiencia, Impacto y Sustentabilidad)
2) Identificar los problemas pendientes y recomendar las medidas correctivas a ser tomados en la etapa mas allá de la terminación del Proyecto por parte de los respectivos gobiernos, y
3) Considerar las lecciones aprendidas a través de las actividades del Proyecto, con el objeto de reflejarlas en otros proyectos futuros, con el interés de hacerlos mas efectivos y eficientes.

1.2 Metodología de la Evaluación

El Comité Conjunto de Evaluación, ha analizado los informes producidos por el Proyecto y ha efectuado entrevistas al personal de la contraparte argentina y a los expertos japoneses de largo plazo.

(1) Los logros del Proyecto
Se han evaluado los logros, en términos de Objetivos del Proyecto, Aportes y Resultados, comparados contra la Matriz del Proyecto (PDM)

(2) Proceso de Implementación
Se ha evaluado la Implementación del Proceso del Proyecto, en términos de Actividades, comparados contra la Matriz del Proyecto (PDM)

(3) Evaluación en base a los cinco criterios
El Proyecto ha sido evaluado basado en los siguientes cinco criterios:

1) Relevancia
La Relevancia está referida a la validez del Objetivo del Proyecto y de la Finalidad del Proyecto en relación a las políticas de desarrollo del gobierno argentino, como así también a las necesidades de los beneficiarios.
2) Efectividad
La efectividad está referida a la amplitud hasta el cual alcanzaron los beneficios esperados, según lo planeado, y analiza si se obtuvieron los beneficios como resultado del Proyecto.
3) Eficiencia:
La eficiencia está referida a la productividad del proceso de implementación, analizando si los inputs al Proyecto se han convertido en output en forma eficiente.

4) Impacto
El impacto está referido a los impactos directos e indirectos, positivos y negativos provocados por la implementación del Proyecto, incluyendo el alcance al cual la Finalidad del Proyecto se ha planteado.

5) Sustentabilidad
La sustentabilidad esta referida al alcance según el cual el Proyecto puede continuar su desarrollo por la Argentina, y que se pueden sostener los beneficios generados por el Proyecto bajo las políticas nacionales, tecnologías, sistemas y estados financieros.

1.2 Miembros del Comite Conjunto de Evaluacion

(1) Comité Japonés de Evaluación

Nombre	Asignación	Ocupación
Sr. Hiroshi NISHIKI	**Líder del Comité**	**Staff, División Sudamérica, Departamento Regional III (Latino america y el Caribe) JICA**
Sr. Seiji KATO	**Asesor de Management**	**Vice Representante Residente JICA Argentina**
Dr. Kiroku KOBAYASHI	**Asesor Técnico Senior**	**Asesor Jefe del Proyecto - JICA**
Srta. Yasuyo HIROUCHI	**Analisis de la Evaluación**	**Experto Permanente, International Development Associates Ltd.**

(2) Comité Argentino de Evaluación

Nombre	Asignación	Ocupación
Ing.Agr. Carlos Alberto Cheppi	**Lider del Comite**	**Presidente Instituto de Tecnología Agropecuaria**
Dra. Ana SADIR	**Asesor Técnico Senior**	**Directora del Centro de Investigaciones Agrícolas y Veterinarias - INTA**
Ing. Agr. Roberto E. LECUONA	**Asesor Técnico Senior**	**Supervisor del Proyecto Director del Instituto de Microbiología y Zoología Agropecuaria - INTA**
Dra. Laura GASONI	**Asesora Técnica**	**Líder de Grupo del Proyecto - Investigadora del Instituto de Microbiología y Zoología Agropecuaria - INTA**

1.3 Cronograma de Evaluación

Fecha	Dia	Actividades
22 Mar	Lun	- Entrevistas con expertos y miembros de la C/P
23 Mar	Mar	- Reunión Comité Conjunto de Evaluación (preparación) - Entrevistas con expertos y miembros de la C/P
24 Mar	Mie	- Entrevistas con expertos y miembros de la C/P - Preparación del Informe Final
25 Mar	Jue	- Entrevistas con expertos y miembros de la C/P - Reunión Comité Conjunto de Evaluación
26 Mar	Vie	- Reunión Comité Conjunto de Evaluación (Firma del Informe Final de Evaluación)

2. LINEAMIENTOS DEL PROYECTO

2.1 Antecedentes del Proyecto

Las enfermedades de plantas causadas por los fitopatógenos *Rhizoctonia* y *Fusarium,* responsables de considerables perdidas económicas en Argentina, han sido controladas por medio de productos esterilizantes para suelo como el bromuro de metilo. Sin embargo, el uso de bromuro de metilo será prohibido en el año 2010, según el acuerdo alcanzado en la "Convención de Viena para la Protección de la Capa de Ozono" (1995), debido a los efectos negativos en la salud humana y la disminución de la capa de ozono, en el marco del"Protocolo de Montreal para las Sustancias que Reducen la capa de Ozono".

En respuesta a esta situación, se estudiaron profundamente los métodos de control biológico de enfermedades fúngicas radiculares en plantas, a través de la introducción de microorganismos, con resultados exitosos.

Entre 1994 a 1998, investigadores del Instituto de Microbiología y Zoología Agricola (IMYZA) y expertos de corto plazo de JICA llevaron a cabo un estudio conjunto sobre control biológico en la Argentina, y como resultado se seleccionaron y caracterizaron algunos microorganismos benéficos que mostraron la aptitud de controlar hongos fitopatógenos de suelos.

A los efectos de hacer el máximo aprovechamiento de los resultados del estudio de la cooperación tecnológica arriba descrita, el gobierno argentino ha solicitado un proyecto de cooperación técnica para el estudio conjunto sobre control biológico de hongos fitopatogénicos de suelos y raíces, como alternativa del uso del bromuro de metilo.

El gobierno japones envió un grupo de estudio preliminar en setiembre de 2000. En base a los resultados de este estudio preliminar, ambos gobiernos firmaron el documento Registro de Discusiones para el presente Proyecto en mayo 2001.

2.3 Sumario del Proyecto

El Proyecto ha sido planificado de la siguiente manera:

1) Finalidad del Proyecto :
   Se difundirán Métodos de control seguros contra enfermedades radiculares en la Republica Argentina.

2) Objetivo del Proyecto:
Se desarrollarán Métodos de Control Biológico contra enfermedades radiculares en la Argentina.

3) Resultados del Proyecto:
   1) Se determinará la efectividad de varias combinaciones de microorganismos para el biocontrol de enfermedades en plantas en invernaderos y parcelas de prueba, para la selección de aquellas que son efectivas.
   2) Se determinará la efectividad de los microorganismos seleccionados a nivel de campos infectados, para identificar los agentes biológicos potenciales.
   3) Se determinará la influencia de los agentes biológicos potenciales sobre comunidades de microorganismos existentes, para identificar aquellas que sean seguras.
   4) Se determinarán las características de los agentes biológicos seguros.
   5) Se desarrollará un programa integral de control de enfermedades en plantas utilizando agentes biológicos seguros.

3. AJUSTES DEL MARCO DE PROYECTO (PDM)

La Comisión Conjunta de Evaluación, previo a la realización de la evaluación, ha efectuado ajustes sobre la última versión del Marco del Proyecto (PDM) y de común acuerdo han efectuado algunas correcciones los cuales se describen en el Anexo 1-1, como así también preparado la versión corregida del documento (PDM for Evaluation: PDMe) según el Anexo 1-2.

4. RESULTADOS DE LA EVALUACION

4-1 Logros del Proyecto:

Los logros del Proyecto, en términos de inputs y outputs, se esperan que se cumplan plenamente al fin del Proyecto.
El análisis detallado se muestra en el Anexo-2 "Evaluation Grid (1) Accomplishment"

4-2 Implementation Process

En general, las actividades del Proyecto se desarrollaron de acuerdo al plan original. El monitoreo del Proyecto se realizó periódicamente pero esto no estuvo basado en los requerimientos del documento R/D. El Consejo Directivo no se ha organizado oficialmente pero sus miembros han tenido contacto en forma frecuente con el Proyecto y en diferentes ocasiones intercambiando opiniones.
El analisis detallado se muestra en el Anexo-3 "Evaluation Grid (2) Implementation Process"

4-3 Evaluacion basado en los cinco criterios

I) Relevancia

El Proyecto se considera que posee una alta relevancia. A los efectos de cumplir con los acuerdos, la prosecución de metodos seguros para el control de enfermedades en plantas, como una alternativa al uso del bromuro de metilo es esencial. La sustentabilidad de la agricultura también es una de las políticas nacionales. El

desarrollo de métodos de control biológico como una alternativa de la del bromuro de metilo es relevante con las necesidades del INTA y de los productores locales.
El análisis detallado se muestra en el Anexo-4 "Evaluation Grid (3) Evaluation based on the five criteria".

II) Efectividad

El Proyecto se considera que tuvo una alta efectividad. Los efectos de los metodos de control biológico han demostrado ser positivos. Las técnicas y los conocimientos relativos a la selección de los microorganismos efectivos, la evaluación de sus impactos en microorganismos existentes en campos, la determinación de sus propiedades como también el desarrollo del control integral de enfermedades en plantas se transfirieron y el personal de la contraparte ha adquirido capacidad suficiente para realizar las investigaciones correspondientes por si mismos. Se espera que el objetivo del Proyecto será totalmente alcanzado al final del Proyecto. Las contribuciones de los diferentes resultados del Proyecto se han visualizado como altos.
El analisis detallado se muestra en el Anexo- 4 seccion correspondiente a " Effectiveness".

III) Efficiency

A juzgar por el nivel alcanzado por los resultados, la provisión de los aportes se han ejecutado en forma eficiente. En general, el "timing" de los aportes, la cantidad y la calidad de los mismos tanto del lado argentino como del lado japonés han sido adecuados. Además, el Proyecto ha hecho el máximo aprovechamiento del plan de cooperación tecnica JICA-IMYZA que le precedió.
El análisis detallado se muestra en el Anexo- 4 sección correspondiente a "Efficiency".

IV)Impacto

La Finalidad del Proyecto se vislumbra ser alcanzado varios años más adelante, una vez finalizado del Proyecto. Además, el Proyecto ha dado, y se espera que dé, algunos otros impactos. Una compañía privada, interesada en el control biologico ha provisto apoyo financiero al IMYZA para cubrir una parte de los costos operativos de los ensayos de campo. Los resultados del Proyecto se han publicado en forma amplia a traves de simposios internacionales, conferencias nacionales, y revistas cientificas etc. y han contribuido a incrementar
El análisis detallado se muestra en el Anexo- 4 sección correspondiente a "Impact".

V) Sustentabilidad

Se estima que los resultados positivos del Proyecto serán sostenidos en el tiempo luego de finalizado el mismo.
Desde el punto de vista institucional, los desarrollos de métodos de control biológico tienen una política y el apoyo institucional. Se espera que el personal de la contraparte va a continuar ligado a las tareas de investigación correspondientes.
Desde el punto de vista financiero, se espera que la IMYZA a través del INTA, va a proveer los fondos necesarios para la realización de las investigaciones y desarrollos de métodos seguros de control biológico.
Desde el punto de vista técnico, se ha desarrollado suficientemente la capacidad técnica del personal de la contraparte para continuar las investigaciones por si mismos.
Se espera que los métodos de control biológico desarrollados por el Proyecto serán utilzados y divulgados por parte del INTA.

El análisis detallado se muestra en el Anexo- 4 sección correspondiente a "Sustainability".

5. CONCLUSIONES

El Proyecto ha sido realizado de manera adecuada y se espera que el objetivo del Proyecto sea alcanzado al fin del Proyecto. En consecuencia, el Comité Conjunto concluye que el Proyecto deberá terminarse al fin del periodo de 3 años, tal cual lo planeado originalmente en el documento R/D.

6. RECOMMENDACIONES

A través del Proyecto se han desarrollado los métodos de control biológico de hongos fitopatogénicos afectando hortalizas y flores cultivadas en invernaderos, incluyendo microorganismos y técnicas de control integrados (por ej. Solarizacion y esterilización reductiva). Las técnicas necesarias para desarrollar los métodos se han transferido a IMYZA. En consecuencia, en el futuro será necesario realizar tareas de extensión agrícola para productores para promover el uso de los métodos arriba mencionados como alternativas del bromuro de metilo. Para este propósito será necesario que el IMZA continúe las investigaciones /ensayos aplicando las técnicas transferidas, acumulando mas datos para los microorganismos y técnicas mencionados mas arriba, para asi obtener el producto final adecuado para uso comercial.
Para alcanzar dicho propósito, se recomiendan los siguientes ítems:

1. Para asegurar una actividad de investigaciones sostenible en el tiempo por parte del IMYZA, es esencial que el INTA continúe dando el apoyo institucional y financiero a éste.
2. Para asegurar una actividad investigativa sostenible en el tiempo, se recomienda que el IMYZA considere la posibilidad, no solo dependiendo del presupuesto asignado por el INTA, sino también otros medios para la generación de recursos genuinos adicionales, utilizando las técnicas adquiridas por el Proyecto, (por ej. A traves de provisión de servicios técnicos, organización de "work-shops" técnicos para universidades y otros centros de investigación. etc)

7. OTROS COMENTARIOS

Actualmente se observan numerosos problemas en la agricultura de la Argentina. En especial el aumento de enfermedades de raíces y de suelos, como asi también la degradación de suelos, causados por el cultivo repetido representado por los monocultivos de la soja y la ejecución de cultivos sin roturado de la tierra son problemas que se han tornado sumamente serios.
A los efectos de combatir los problemas originados por el cultivo repetido, es importante la inmediata implementación de investigaciones para el análisis de los microorganismos correspondientes y de los métodos de control.
Es nuestro deseo que, en tales tareas de investigación, sean bien utilizados los resultados obtenidos a través del presente Proyecto.

RECORD OF DISCUSSIONS BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT
OF THE ARGENTINE REPUBLIC
ON JAPANESE TECHNICAL COOPERATION
FOR THE JOINT STUDY PROJECT
ON BIOLOGICAL CONTROL OF SOIL-BORNE PLANT DISEASE

The Japanese Preliminary Study Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Prof. Kiroku KOBAYASHI, visited the Argentine Republic from September 25, 2000 to September 29, 2000 for the purpose of working out the details of the technical cooperation program concerning the "Joint Study Project on Biological Control of Soil-Borne Plant Disease."

During its stay in the Argentine Republic, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of the Argentine Republic with respect to desirable measures to be taken by both Governments for the successful implementation of the above-mentioned Joint Study Project.

Based on the discussions, and in accordance with the provisions of the Agreement on Technical Cooperation between the Government of Japan and the Government of the Argentine Republic, signed in Tokyo on October 11,1979 (hereinafter referred to as "the Agreement"), the Resident Representative of JICA Argentine Office and the National Director of National Institute of Agricultural Technology (hereinafter referred as "INTA") agreed to recommend to their respective governments the matters referred to in the document attached hereto.

This document was prepared in both English and Spanish, with each text being equally authentic. However, in case of any divergence of interpretation, the English text shall prevail.

Buenos Aires, 0 2 MAY 2001

Mr. Masahiro KUMOMI
Resident Representative
Argentina office,
Japan International Cooperation Agency ; JICA

Agr. Eng. Oscar COSTAMAGNA
National Director
National Institute of Agricultural Technology
Argentine Republic

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Argentine Republic will cooperate with each other in implementing the Joint Study Project on Biological Control of Soil-Borne Plant Disease (hereinafter referred to as "the Project").

2. The Project will be implemented in accordance with the Master Plan, which is described in Annex I.

II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide, at its own expense, the services of the Japanese experts listed in Annex II through normal procedures under the technical cooperation scheme of the Government of Japan.

2. The provision of Article IX of the Agreement will be applied to the above-mentioned experts.

III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide, at its own expense, such machinery, equipment and other materials necessary for the implementation of the Project as listed in Annex IV, through normal procedures under the Technical Cooperation Scheme of Japan.

2. The articles referred to in III.1. above will become the property of the Government of the Argentine Republic upon being delivered to the Argentine authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese experts listed in Annex II.

3. The provision of Article VII-1 of the Agreement will be applied to the Equipment.

IV. TRAINING OF ARGENTINE PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive, at its own expense, Argentine personnel connected with the Project for technical training in Japan through normal procedures under the technical cooperation scheme of the Government of Japan.

2. The Government of the Argentine Republic will take necessary measures to ensure that the knowledge and experience acquired by Argentine personnel from technical training in Japan will be utilized effectively for the implementation of the Project.

V. LOCAL EXPENSES

A certain portion of the local expenses necessary for the implementation of the Project will be borne by JICA in accordance with the laws and regulations in force in Japan. The designated member of Japanese expert team will manage the budget, which is to be used exclusively for the implementation of the Project.

VI. DATA OWNERSHIP AND PUBLICATIONS

The data and findings accumulated through the Project will be jointly owned by the participating organizations (JICA and Microbiology Institute [hereinafter referred to as "IMYZA"]). When reports or documentation concerning the Project are compiled, it is to be mentioned that the Project was implemented jointly by JICA and IMYZA as a technical cooperation project between the Government of Japan and the Government of the Argentine Republic.

VII. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE ARGENTINE REPUBLIC

1. In accordance with the laws and regulations in force in the Argentine Republic, the Government of the Argentine Republic will take necessary measures to provide the following at its own expense:

(1) Services of Argentine technical and administrative personnel;

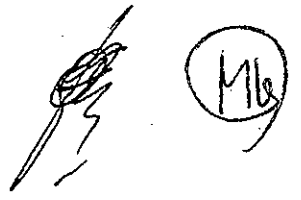
(2) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided through JICA under III above;

(3) Transportation facilities for the Japanese experts;

(4) Facilities necessary for the maintenance, protection and utilization of the articles listed in Annex IV;

(5) Arrangement for the utilization of the land and facilities needed for the Project implementation.

2. In accordance with the laws and regulations in force in the Argentine Republic, the Government of the Argentine Republic will take necessary measures to meet:



(1) Expenses necessary for the transportation within the Argentine Republic of the articles referred to in III above as well as for the installation, operation and maintenance thereof;

(2) Customs duties, internal taxes and any other charges, imposed in the Argentine Republic on the articles referred to in III above;

(3) All local expenses necessary for the implementation of the Project other than those provided through JICA under V above.

VIII. ADMINISTRATION OF THE PROJECT

The leaders of the both Japanese Expert and the Argentine team will jointly assume overall responsibility for the implementation of the Project.

IX. CLAIMS AGAINST JAPANESE EXPERTS

In accordance with the provision of Article VII of the Agreement, The Government of the Argentine Republic will undertake to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Argentine Republic, except for those arising from the willful misconduct or gross negligence of the Japanese experts.

X. MUTUAL CONSULTATION

There will be mutual consultation between the authorities concerned of the two governments on any major issues arising from or in connection with this Attached Document.

XI. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be from June 2001 to May 2004.

ANNEX I. MASTER PLAN
ANNEX II. PROJECT TEAMS AND PARTICIPATING ORGANIZATIONS
ANNEX III. PRIVILEGES, EXEMPTIONS, AND BENEFITS
ANNEX IV. LIST OF ARTICLES AND EQUIPMENT
ANNEX V. TENTATIVE IMPLEMENTATION SCHEDULE
ANNEX VI. MAP OF PROPOSED PROJECT SITES
ANNEX VII. PROJECT DESIGN MATRIX

ANNEX I. MASTER PLAN

I. Background

Soil-borne plant diseases caused by Rhyzoctonia and Fusarium, and responsible for considerable economic loss in Argentina, had been well controlled by the use of Soil sterilizers like methyl. However, the use of methyl bromide will be banned by 2010 under an agreement reached during the "Vienna Convention for the Protection of the Ozone" due to negative effects to human health and ozone layer destruction identified by the "Montreal Protocol for Substances that Deplete the Ozone Layer" held in 1995 in Vienna.

In response to this situation, biological control of soil-borne plant diseases through the introduction of microorganisms has been studied extensively with some remarkable results.

From 1994 to 1998, researchers from the Microbiology Institute (IMYZA) and JICA experts carried out a project entitled "Root Rot Fungi Biological Control". Under this project, JICA experts namely Dr. Kiroku Kobayashi and Dr. Norio Kondo from Hokkaido University, together with their Argentine counterparts, carried out experiments on biological control in Argentina. As a result of the project, some beneficial microorganisms that showed the ability to control soil-borne phytopathogenic fungi were selected and characterized. This led to the development of application method for biofungicides (covering seeds or mixed into the soil), in reducing the incidence of disease in greenhouses and field plots.

II. Objectives

1 Overall Goal

A safety control method against soil-borne plant diseases is introduced in Argentina.

2 Project Objectives

(1) A biological control method against the Soil-borne Plant Disease is developed.

(2) A system, which identifies biological control agents and makes these agents practically usable, is established in Argentina.

III. Study Framework

1. Test of the combination of selected microorganisms on the controlling plant diseases under the greenhouse and growth chamber conditions.

2. Experimentation on selected microorganisms to control plant diseases in infected open field.

3. Study on the influence of biological control agents for existing microorganisms in the natural field.

4. Identification of the microorganisms composing the biological control agents at the DNA level, and analysis of their properties.

5. Experimentation on the comprehensive protection programs, using cleaning crops, solarization and biological control agents.

ANNEX II. PROJECT TEAMS AND PARTICIPATING ORGANIZATIONS

1. The Project will be implemented jointly by the Japanese study team and the Argentine study team.

The Argentine team will consist of personnel assigned by the Microbiology and Zoology Institute, National Institute of Agricultural Technology, Secretariat of Agriculture.

2. The teams will consist of the following experts:

(1) The Japanese study team:
-Researcher/expert(s) in the field of Biological Control of Plant Disease
-Researcher/expert(s) in the field of Plant Pathology
-Researcher/expert(s) in the field of Soil Microbiology

(2) The Argentine study team:
-Project supervisor and chairperson of the steering committee
-Team leader
-Research managers
-Researcher/expert(s) in the field of Biological Control of Plant Disease
-Researcher/expert(s) in the field of Plant Pathology
-Researcher/expert(s) in the field of Microbiology

(3) Steering Committee:

For the successful implementation of the Project, a Steering Committee consisting of the following members, shall be established:

Argentine side:

Chairperson: National Director, National Institute of Agricultural

Members :

Director of the Microbiology and Zoology Institute (IMYZA)

Team Leader

Research Manager

Japanese side:

First Secretary of the Embassy of Japan

Resident Representative of JICA Argentina Office

JICA experts connected with the Project

The committee will meet twice a year to exchange views and take necessary measures for the effective implementation of the Project.

ANNEX III. PRIVILEGES, EXEMPTIONS, AND BENEFITS

1. The Government of the Republic of Argentina will grant exemptions from income tax and charges of any kind imposed on or in connection with the living allowances of the Japanese experts remitted from abroad.

2. The Government of the Republic of Argentina will grant exemptions from customs duties in respect of the importation of personal effects by the Japanese experts and their families as well as the importation of machinery and equipment relating to their activities.

ANNEX IV. LIST OF ARTICLES AND EQUIPMENT

(1) List of equipment

1. Equipment and materials for IMYZA laboratories
2. Equipment and materials for field studies
3. Computer systems for analytical work and data processing
4. Other necessary machinery, equipment, and materials that is mutually agreed upon

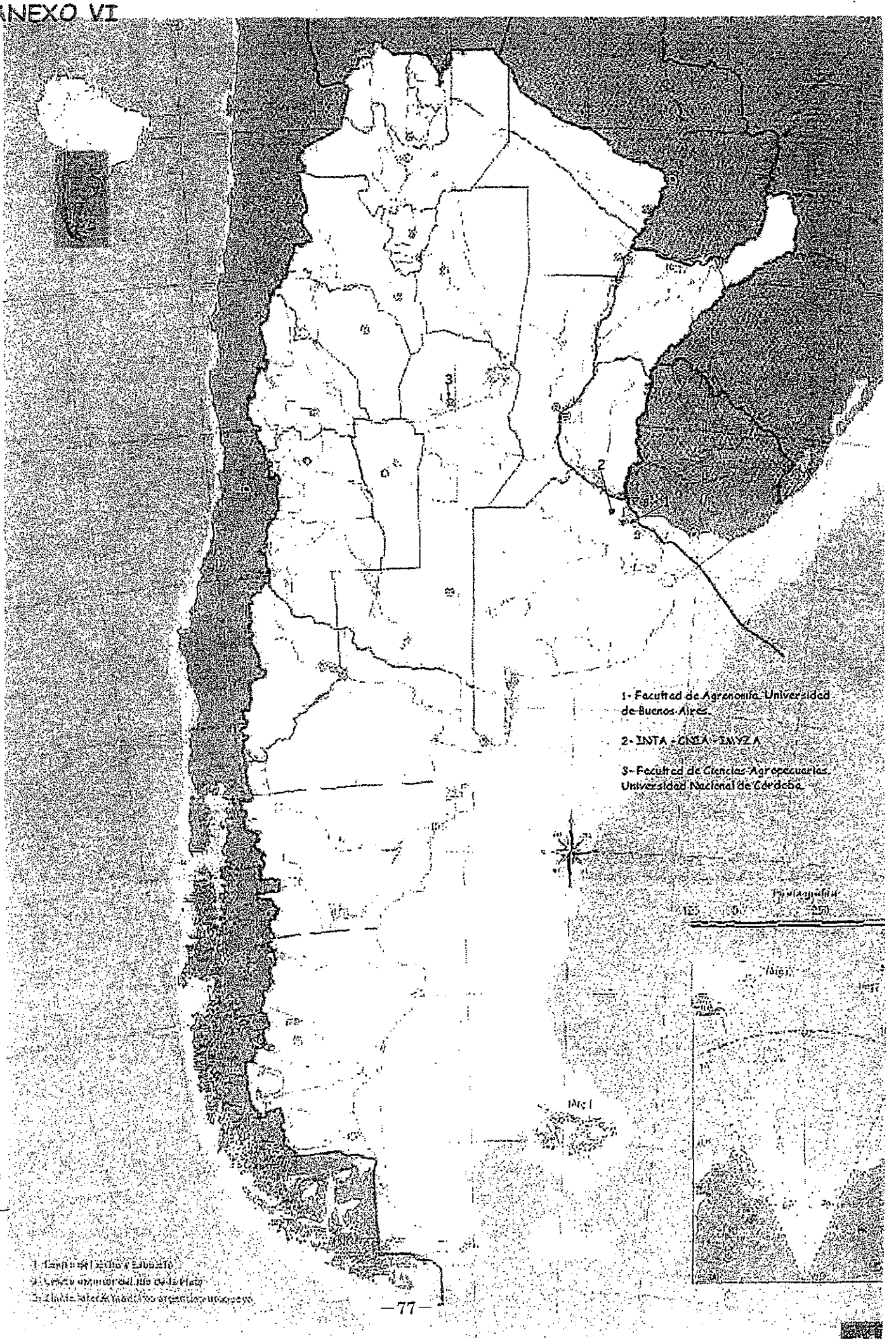
(2) The equipment will be provided by JICA according to budget approval in each Japanese fiscal year (from April to March).

ANNEX V. TENTATIVE IMPLEMENTATION SCHEDULE

Items	First year (6/2001 - 5/2002)	Second year (6/2002 - 5/2003)	Third year (6/2003- 5/2004)
Program activities			
1. Field studies	----------	----------	----------
2. Report writing	-----	-----	-----
3. Organization of seminars, workshops			------
Japanese contribution			
1. Expert assignment			
(Long term)			
- Biological Control of Plant Disease	----------	----------	----------
(Short term)			
- Plant Pathology	--------	--------	-------
- Soil Microbiology	--------	--------	-------
2. Provision of equipment	--------	--------	-------
3. Training of Argentine personnel in Japan (Two Argentine counterparts to be trained in Japan annually)	--------	--------	-------
Argentine contribution			
1. Provision of land and facilities	----------	----------	----------
2. Personnel assignment			
Researchers			
- Biological Control of Plant Disease	----------	----------	----------
- Plant Pathology	----------	----------	----------
- Microbiology	----------	----------	----------
and other supporting staff	----------	----------	----------

Note this schedule is subject to change in accordance with the progress of the Project.

ANEXO VI


1- Facultad de Agronomía. Universidad de Buenos Aires.
2- INTA - CNEA - IMYZA
3- Facultad de Ciencias Agropecuarias. Universidad Nacional de Córdoba.

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ANNEX VII.
PROJECT DESIGN MATRIX (PDM)
PROJECT NAME : Joint Study Project on Biological Control of Soil-Borne Plant Disease
PERIOD OF PROJECT : 3 (three) years; 2001/6 to 2004/5
TARGET GROUP : INTA - Instituto Nacional de Tecnologia Agropecuaria,
IMYZA - Instituto de Microbiologia y Zoologia Agricola
JICA department in charge: South America Division, Department of Latin America and the Caribbean

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
OVERALL GOAL A safety control method against the soil-borne plant disease is extended in Argentine.	1 Use of methyl bromide in Argentine is eliminated 2 Biological control agents are registered and produced	1 Statistics on use of fungicides 2 Statistics on use of control agents and agriculture 3 Production records and registration records of biological control agents	1 The government policy to eliminate the use of methyl bromide in Argentine by 2005 does not change 2 New diseases do not break out 3 New chemical fungicide does not pose a hazard to the ozone layer and human health
PROJECT PURPOSE 1 A biological control method against soil-borne plant diseases is developed 2 A system, which identifies biological control agents and makes these agents practically usable, is established in Argentina.	1 Similar or better effect on soil-borne plant disease than methyl bromide is approved 2 Results of the Study are presented on a Soil Science Society or published by INTA as a bulletin or on its web site 3 References to the Project made by related institutions and researchers	1 results of tests 2 presentations on a Soil Science Society or publication on a website 3 List of institutions and researchers related to the Study	1 The personnel and budget of IMIZA are not reduced 2 The Biological control agents ate approved 3 Farmers do not object to using biological control agents
OUTPUTS 1 Effectiveness of various combinations of the selected microorganisms to control plant diseases in the greenhouse and growths chamber is shown 2 Effectiveness of the selected microorganisms in the naturally infected field is shown 3 The influence of biological control agents on existing microorganisms becomes clear 4 The properties of selected microorganisms become clear 5 Effectiveness of the plant disease control programme without use of chemical control agents is shown	1 Numerical values of effect of each combination against plant disease 2 Numerical values of effect of selected microorganisms on plant diseases 3 Effect of selected microorganisms on existing microorganism composition, plant diseases, and yield 4 The properties (DNA construction) of selected microorganisms 5 Numerical values of effect of control programme against soil-borne plant diseases	1 results of tests 2 results of tests 3 results of tests 4 results of analysis 5 results of tests	1 Climate in Argentine does not change drastically

	INPUTS		
ACTIVITES 1 Preparation of Study schedule 2 Preparation of the necessary equipment, greenhouse, and experimentation fields 3 Implementation of the following experiments: (1) Combination test of selected microorganisms on controlling plant diseases under the greenhouse and growth chamber conditions. Different types of formulations (including selected bacterial and fungal agents) will be prepared and applied on seeds, roots or soils. Equipment and greenhouse must be ready before starting assays. (2) Experimentation of effective microorganisms to control plant disease in infected open field Field treatments with different combinations of microorganisms on soils known to be infected with phytopathogenic fungi will be established. Equipment must be installed before starting assays. (3) Study on the influence of biological control agents for existing microorganisms Impact evaluation of application of different antagonistic agents to the previous microflora will be carried out (4) Identification of the microorganisms composing the biological control agents at the DNA level, and analysis of these properties. Characterization of different microorganisms included in selected formulations will be performed in order to determine the species or biotypes of agents as well as metabolites produced. Equipment must be installed before starting assays. (5) Experimentation on a comprehensive protection program using cleaning crops, solarization and biological control agents. Cleaning crop will be used to avoid spread of diseases to different crops. The effect of solarization and colonization with beneficial microorganisms to reduce pathogen density will be evaluated. 4 Publication of the Study results	Japanese Side 1 Dispatch of Japanese long-term expert(s) and short-term experts 2 Training of Argentine counterpart personnel in Japan 3 The expenses necessary for the implementation of the Project 4 Equipment necessary for the implementation of the Project	Argentina Side 1 Assignment of counterpart personnel and other necessary staff members 2 Office and necessary equipment for the Project 3 Necessary expenses for the implementation of the Project	1 The counterpart personnel continue to stay in the related institution of the Project PRE-CONDITIONS

収集文献・資料一覧

1. "Biological Control of Soilborne Plant Diseases"
   Proceeding of the International Seminar on Biological Control of Soilborne Plant Diseases　Japan-Argentina Joint Study
   Edited by K. Kobayashi, L. Gasoni and H. Terashima

2. "Publications"
   ～On JICA Joint Study on Biological Control of Soilborne Plant Diseases～


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