8. COOPERATION TO BE REALIZED DURING THE PROPOSED PERIOD

1) On the input from both sides

Japanese side;

Long-term expert: One more expert in the field of plant breeding may be considered. Because this field is very wide.

Short-term expert: 5 experts will be dispatched anually.

Training: 5 to 6 persons annually.

Equipments: Necessary eqipments in the badgetary limits.

Chilean side;

Counterpart: Early assignment of full-time counterpart and proposed assistants for each bankand quqrantine system, and also sufficient staff for biotechnology laboratory.

Equipments: Necessary eqipments in the badgetary limits.

Local expenditure: More sufficient and timely assignment is necessary.

2) On the activity of the detailed plan

Detailed plan of cooperation for proposed period was discussed. Several minor items where research progress in other countries are supposed to help us in near future, or the availability of an appropriate short-term expert for the problem seems to be very scarse, are to be suspended from our cooperation plan.

Other detailed items not much developed so far (say less than 30% attainment) were examined whether they are to be self-supported. Those related to collection and evaluation of genetic resources may need much more cooperation, that is, cooperation until december of 1993 may not be sufficient to reach at the self-supporting stage. While progress in technology of these areas, specially identificaton and evaluation using biochemical character has been so extensive that the initial detailed plan could not preview. Thus, it is expected to incorporate these new developments into our activities.

*The detail of the activities of the remaining period shown in attached table.

3) On the administration of the project

Technology transfer of a short-term expert is to be directed to a counterpart scientist.

INIA may take necessary measures to stabilize the status of counterparts in order to attain smoother transfer of technology.

Closer contacts between related programs are recommended.

JICA may follow annual plan which is to be prepared in the beginning of the fiscal year.

* Detailed of activities on remaining period is shown in table 1

MEMBER OF THE TECHNICAL GUIDANCE TEAM FOR
PLANT GENETIC RESOURCES CONSERVATION PROJECT

(Mar. 6, 1992 - Mar. 20, 1992)

Dr. Katsuo OHYAMA	LEADER / GENETIC RESOURCES MANAGEMENT	EX-DIRECTOR, INSTITUTE OF RADIATION BREEDING, NATIONAL INSTITUTE OF AGROBIOLOGICAL RESOURCES, M.A.F.F.
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Japan International Cooperation Agency (JICA)

TABLE

Progress of the past three years activities on remaining period(1992/1993)

Note: ═══ initial activity plan

── activity attained

---- activity on remaining period

	Mark of Attainment	Remarks
(A)	more thab 60% attainment	The activity is in prgress as scheduled
(B)	30% to 60% attainment	Should be finished in the remaining period with greater
(C)	less than 30% attainment or not yet realized up to now	efforts of both sides
(D)	item suspended	basically activities this item is not included in the remaining period

I . CONSTRUCTION OF THE BASE BANK, ACTIVE BANKS AND OTHER FACILITIES.

ITEM / FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
1.SEED STORAGE						To advice about design and construction of safe and effective long-term & mid-term seed storages.	Construction was completed and tested with satisfactory result. Although minor improvement and addition are recommended. (A)	To study on possible implementation of solar energy system.
2.QUARANTINE GREENHOUSES						To advice about design and construction of the quarantine greenhouse with necessary and sufficent isolating conditions, and to inspect its complation.	Construction was completed with some additional structures. Inspection of the system was satisfactory. (A)	INIA should consider how to install the remaining isolating units.

Ⅱ-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.

(1) SURVEY AND COLLECTION

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT.	ACTIVITIES ON REMAINING PERIOD
1)RESEARCH ON STRATEGY OF COLLECTION						To do research on collecting strategy based on the analysis of collected materials, and to study appropriate collection method.	Collected specimens of some forage and historical small grain species have been investigated and helped by botanical collection records and botanists' recommendations, collection strategy was discussed. (B)	Beans, maize or other collections will be analyzed in order to prepare plans for future collection.
2)DETERMINATION OF PRIORITY						Based on the analysis of natural and cultural conditions, to determine priorities of species and area to be collected.	Contact with a Japanese renowned expeditioner suggested the importance of ethnobotanical significance fo some collection plan. This was realized by a fortunate coincidence of related parties.(B)	Priority among agronomicaly important species will be analyzed.
3)SURVEY OF DISTRIBUTION						To survey areas not yet collected for important crop-related species or those unique to Chile.	(C)	Preliminary survey on limited genera or species may be considered.
4)CLASSIFICATION OF COLLECTION						To identify distribution of genus and species of important genetic resources and classify collected materials.	(C)	Tentative analysis on limited species may be of interest for future application.
5)INTERNAL COLLECTION						To collect vegetable species, beans, potato and others for uncollected areas.	Collections of strawberry, beans, forage plants and other species were realized by eventual cooperation from abroad, USDA, CIAT, JICA mission and DSIR (NZ). (A)	Collection according to the priority will be realized.
6)EXTERNAL COLLECTION						To supplement internal collections of important resources, to introduce or collect related species from neighboring countries.	(C)	Contact for cooperation is needed. Analysis of the existing collection is a prerequisite.
7)EXCHANGE OF COLLECTION						To introduce or exchange collections from or with other institutions to implement INIA collection.	Long-term duplicate conservation of collections from other genetic resource centers of neighboring countries has been discussed. (C)	
8)EXPEDITIONS						To plan and realize expeditions of unutilized genetic resouces for possible future use.		

Ⅱ-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.

(2) MULTIPLICATION AND REGENERATION.

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
1)MULTIPLICATION OF EXISTING RESOURCES						To multiply important genetic resources for long-term storage.	Delay in completion of bank facilities resulted in the repeated revision of this plan. Crop programs are suffering from serious deficiency in planting cost. (B)	Much closer cooperation with crop programs is indispensable.
2)MULTIPLICATION OF COLLECTED RESOURCES						To multiply collected materials for characterization and long-term storage.	(C)	
3)PHYSIOLOGY OF SEED PRODUCTION						To do research on physiology of seed production to obtain good quality seed for long-term storage	(D)	
4)MAINTENANCE OF GENETIC CONSTITUTION						In order to prevent genetic shift of characteristics in seed multiplication, to do research and propose practical guidlines for seed multiplication of some species.	(D)	

Ⅱ-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.

(3) PRESERVATION AND CONSERVATION.

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
1)ANALYSIS OF SEED LONGEVITY						To analyze physiological response of seed of indigenous species in order to find optimum storage conditions.	(D)	
2)SEED AND VEGETATIVE PLANT CONSERVATION						To establish long-term seed storage for important agricultural species.(seed 24.000, plant 500)	Registration of base & active collection has been delayed accompanied by the delay of passport data registration. Beans, soybeans and maize have been partly registered. Condition of working collection storage has been greatly improved. Fruit trees and some vegetable crops, garlic, asparagus etc, are in the process of registration. (B)	Much closer cooperation with crop program is highly recommended.
3)PHYSIOLOGY OF GERMINATION						To research conservation of recalcitrant seeds. To find means to rescue deteriolating seeds.	(D)	
4)IN VITRO CONSERVATION						To establish long-term conservation of genetic resources using in vitro technique.(300accessions)	Potato and sweat potato are registered and stored in vitro. (B)	Some other fruits or vegetables are to be stored in vitro with the established technique
5)DEVELOPMENT OF LONG - TERM IN VITRO CONSERVATION TECHNIQUES						To find appropriate in vitro conservation techniques for some species.	Some vegetables or fruits species have been studied to find out appropriate storing conditions. (B)	Research to find a stable long-term storing condition for some species may be started.
6)RESEARCH ON REGENERATION TECHNIQUES FROM CULTURED MATERIALS						To develop regenerating technique for some species to establish long-term in vitro conservation.	(C)	Research to find stable regenerating condition for some species may be started.

II-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.
(4) EVALUATION.

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
1)STANDARDIZATION OF EVALUATION METHODS						To establish consensus on the standardized evaluation process of characteristics for important crop species.	IBPGR minimum descriptors have been recommended for the evaluation of important agronomic species. International Research Centers also recommend further evaluation of recently developed characteristics. (B)	To discuss and finalize if questions are raised on said standards.
2)EVALUATION OF EXISTING RESOURCES						To evaluate important part of INIA collection(17.000 accessions) by the standardized process.	900 accessions of maize have been evaluated by INIA standard. Other important crop species are being evaluated mainly by IBPGR standard with some modifications. (B)	Evaluation by the standardized method will be continued on some important crops.
3)DEVELOPMENT OF EVALUATION TECHNIQUES						To develop a large scale evaluation technique in order to increase efficiency of genetic resources utilization.	(C)	Some efficient large scale evaluation techniques will be introduced and examined.
4)DATA RECORDING AND MANAGEMENT						To establish data base of evaluated characteristics.	(C)	Maize data will be created as a data base. Some other crop data will be prepared as data base.
5)DEVELOPMENT OF DATA PROCESSING TECHNIQUES FOR EVALUATION						To develop data processing techniques for more efficient evaluation and utilization of genetic resources.	(C)	Preliminary study for the applicaction of statistical analysis to help evaluation of genetic resources will be started.

Ⅱ-1. GENETIC RESOURCES MANAGEMENT AND RESEARCH.

(5) DATA REGISTRATION AND PROCESSING.

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
1)SURVEY AND USE OF EXISTING DATA						To search unpublished characteristic data and to augment their utility by publishing or data base creation.	Maize evaluation data were examined and adjusted. Garlic data are now examined and analyzed. (A)	Data of other important crops will be searched and examined.
2)STANDARDIZATION OF DATA						To standardize genetic resources data in order to increase their utilization.	Some discussion over standardization of evaluation data has been centered on the use of IBPGR standard with minor modifications. (B)	Discussion will be continued for other crop data if necessary.
3)DESIGN OF INFORMATION SYSYTEM						To design and establish information management system for genetic resources data.	Information management system related to handling of passport data has been completed. The part related to inventory data is being prepared. (B)	Relational information management system including evaluation data management will be completd.
4)CREATION OF DATA BASE						To create data base of genetic resources using the system in 3).	A part of bean data was created as a data base and now available for retrieval and printing. (B)	Passport data of main crops will be managed as data base.
5)DATA INPUT						To input passport data of newly registered genetic resources and charactirisitc data.	Data input of beans, soybeans, and maize is in progress. (B)	Other important crop data will be input in turn.
6)PUBLICATION OF INDEX SEMINUM						To publish index seminum of INIA genetic resources.	(C)	Publication and distribution of genetic resources passport information as index seminum will be prepared for important species.
7)ESTABLISHMENT OF NATIONAL INFORMATION NETWORK						To establish national information network including INIA Experimental Stations and other institutions.	Contact and consultation with IBM and other companies are unsuccessful. Network formation of INIA Experimental Station by a united information system will be difficult. (C)	Physical transfer of data files in disk casset forms may remain practical.
8)INTERNATIONAL EXCHANGE OF INFORMATION BY NETWORK						To establish international information network in order to exchange information among important genetic resources centers.	Preliminary contacts to international information networks or information service systems are successful in technical terms. (A)	Administrative clearance among genetic resources centers are to be considered.

II-2. ESTABLISHMENT OF QUARANTINE SYSTEM.

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
(1).SURVEY OF QUARANTINE SYSTEMS IN OTHER COUNTRIES FOR RESEARCH MATERIALS						To survey on quarantine systems for genetic resources in the important genetic resources centers of neighboring countries.	Quarantine systems of Japan and some neighboring countries and international research centers have been surveyed. (B)	Visit of Japanese experts and training of Chilean counterparts in Japan will advance the analysis.
(2).ESTABLISHMENT OF QUARANTINE PROTOCOLOS FOR RERESEARCH MATERIALS						To establish protocols of inspection for bacteria, virus, nematodes, etc for introduced research materials.	(C)	Following the above analysis preliminary protocols related to introduced materials will be established.
(3).CONFORMATION WITH NATIONAL QUARANTINE REGULATIONS						To adjust these protocols in conformation with the national quarantine regulations.	(C)	Above protocols will be examined and authorized by national quarantine system of SAG.
(4).ESTABLISHMENT OF A NATIONAL QUARANTINE SYSTEM FOR RESEARCH MATERIALS						To establish national quarantine system proper to the introduced genetic resources of INIA.	(C)	
(5).DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR DETECTION AND THERAPY						To develop advanced techniques for detection, identification and therapy of unexpected pathogens and insects.	(D)	

II-3. UTILIZATION OF GENETIC RESOURCES INCLUDING BIOTECHNOLOGY.

ITEM \ FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
(1).UTILIZATION OF RESOURCES BY CONVENTIONAL TECHNIQUES						To utilize genetic resources of vegetables, fruits, oil crops and others by conventional breeding techniques.	Breeding plans for grape, rape, garlic and asparagus are proposed depending upon advice of each crop expert. (B).	Suitable advice to establish the breeding program of fruits and vegetables is expected.
(2).RESEARCH OF RESOURCES BY CELL ENGENEERING TECHNIQUES						To develop efficient use of genetic resources by various cell engineering techniques.	Haploid breeding techniques of rape, embryo rescue of seedless grapes and mass propagation by in vitro culture of some species are being applied.. (B)	Transfer of further breeding technologies relating to cell engineering for main crops is programmed.
(3).RESEARCH OF RESOURCES BY GENETIC ENGENEERING TECHNIQUES.						To augment efficiency of genetic resources utilization by technology transfer in the field of genetic engineering.	(C)	Preliminary study for the application of genetic engineering of virus coat protein to breed resistant potato plant is to be started.

III. EXCHANGE OF NECESSARY INFORMATION AND RESEARCH MATERIALS.

ITEM / FISCAL YEAR	1989 1st.	1990 2nd.	1991 3rd.	1992 4th.	1993 5th.	FINAL GOAL	PRESENT STATUS AND ATTAINMENT	ACTIVITIES ON REMAINING PERIOD
1. PREPARATION OF MANUALS						To prepare manuals for genetic resources management and utilization with various specialities in a series.	A manual for chromosome observation of various important crop species has been compiled. (B)	Preliminary manuals for genetic resources management will be prepared.
2. SEMINARS, CONFERENCES AND MEETINGS						To hold meeting of related specialists and national/international seminars to exchange information.	In memory of the inauguration of Base Bank in VICUÑA, an international seminar of genetic resources management was held. (A)	An international seminar on genetic resources evaluation and utilization is to be called for.
3. PUBLICATIONS						To publish and distribute pamphlets, manuals, proceedings, index seminum, data book of characteristics, etc.	The significance and activities of genetic resource conservation project was published in a colored pamphlet. Maize evaluation data were prepared in a specially designed data book. (B)	Garlic evaluation data will be published. Index seminum will be prepared for printing.
4. SHORT TERM COURSES						To hold a short training course for national /international participation in order to transfer genetic resources management techniques.	(C)	A short training course on genetic resources management system for national attention will be programmed.
5. INTERNATIONAL EXCHANGE OF GENETIC RESOURCES INFOMATION AND BREEDING MATERIALS						To exchange genetic resources information, literature, breeding materials and other research materials.	Multilateral exchange of genetic resources information has been attained with neighboring countries and international research centers by visits, invitations and communications. Bilateral exchange of genetic resources has also been noted. (A)	Multilateral exchange of information and materials will ever be promoted.

附属資料3. チリ側提出資料（分野別プログレスレポートほか）

1. Background of the Project

1) Position and importance of the Project in the national agricultural plan and its expected role for the development of agriculture in the Republic of Chile.

Agriculture has an increasing economical role, as it supplies most of the food required by the Chilean population and is responsible of a high proportion of the exportations. New cultivars play an important role in keeping up with this condition. INIA is the most important Chilean organization that provides new varieties. Therefore, plant breeding is a very important task within INIA's mandate to support Chilean agriculture.

INIA's plant breeders became aware of several problems in the early 80's: Genetic resources kept by the plant breeding programs were easily lost and poorly conserved; the introduction of germplasm from abroad became very difficult, mainly for vegetatively propagated crops, due to strict plant quarantine measures; and the new biotechnologies were perceived to play an increasing role as every day tools. Furthermore, the Government of Chile signed the FAO's International Plant Genetic Resources Commitment and asked INIA to provide the technical support. These internal and external perceptions moved INIA to try to create two new research programs within its structure: Genetic Resources and Biotechnology. JICA accepted to collaborate in this enterprise and a JICA/INIA "Genetic Resources Conservation Project" was signed between the Government of Japan and the Republic of Chile December 1988. INIA expects that the Project provides the necessary scientific, technical and physical support that allows the consolidation of these two new Programs.

2) Position of the Project in the framework of INIA.

INIA has two main technical divisions: Research and Transfer of Technology. The Research Division comprises 22 National Programs:

- Barley and Oats
- Dry Legumes
- Forages
- Fruits and Grapes
- Maize
- Oilcrops
- Potatoes
- Rice
- Vegetables
- Wheat
- Milk Production
- Beef Production
- Sheep and Goat Production
- Biotechnology
- Entomology
- Genetic Resources
- Plant Pathology
- Postharvest
- Weed science
- Ecology and crop Management
- Soil Fertility
- Irrigation and Drainage

There are 2 Transfer of Technology Programs (Transfer of Technology and Economics) and 5 Support Discipline Programs (Biometry, Communications, Computer Services, Documentation and Information, Seed Production).

The Project is based on the Biotechnology and Genetic Resources Programs of the Research Division. It is also directly related to the ten plant commodity research programs (Barley and Oats, Dry Legumes, Forages, Fruits and Grapes, Maize, Oilcrops, Potatoes, Rice, Vegetables, Wheat), 2 discipline research programs (Plant pathology, Entomology) and 1 Support Discipline (Computer Services).

PROGRESS REPORT OF THE CHILEAN COUNTERPARTS

GENETIC RESOURCES: ALBERTO CUBILLOS

1. Objective of the Project.

The Project includes the following objectives related to genetic resources:

(1) Construction of one Base Bank, three Active Banks and several working collection storage rooms, including laboratory facilities for seed drying, processing and germination.

(2) Development of research activities: exploration, collection, conservation, characterization, evaluation, regeneration, multiplication and documentation.

(3) Exchange of necessary information, data and research materials.

The final aim of the Project is to consolidate a stable and effective Genetic Resources Program at INIA.

2. Progress of the activities.

2.1. Construction of buildings and supply of equipments.

The construction and supply of equipments of the Base Bank at Vicuña Experiment Station, the three Active Banks and several working collection storage rooms at La Platina, Quilampu and Carillanca Experiment Stations, including laboratory facilities for seed processing and germination have been finished. The laboratory facilities for seed germination are sufficiently completed to perform any required tests. The test run of all the banks show that their design and performance are within the expected working conditions. Most of the equipments related to genetic resources have been arrived and are in use at La Platina. The lack of due appointments of Chilean Scientists and Technicians at other Experiment Stations has not allowed to make a better use of these equipments. The process of seed drying has not been tried due to the lack of arrival of the necessary equipments.

2.2. Research activities.

2.2.1. Exploration and collection.

One collection expedition of *Bromus* species have been successfully finished. It was organized as a three country joint expedition: New Zealand, Japan and Chile. All the staff of the Genetic Resources Program and several scientists of the Forage Research Programs participated. The participation of two Japanese experts (Professor S. Sakamoto and Dr. S. Sakai) during the forage expedition handed valuable knowledge and experience on collection and exploration The expedition showed the feasibility to do collection and exploration expeditions within the country if adequate funding is available.

2.2.2. Conservation.

A general estimate of the number of accessions kept by the different plant breeding programs at INIA reaches about 18 thousand entries.

One Japanese expert (Mr. Kimura) accomplished his duties on practical aspects on the management of genetic resources with some difficulties, due to the facts that not all the equipments had arrived, the appointment of thechnical staff was delayed and he lacked of a good English and Spanish speaking level to obtain the most from him. General acquisition schemes were prepared and a good training on several germination tests have been tried under his guidance.

The following programs have already started to place their germplasm into the working collection storage rooms: maize at La Platina, wheat at Quilamapu, wheat at Carillanca. The acquisition of one soybean collection has been ended at La Platina Active Bank. The acquisition of the *Bromus* collection is also in progress at La Platina. The acquisition process of other species has been delayed due to lack of synchronization of the harvest time of good fresh seeds and the ending the test periods of the banks. Germination tests have been done for part of the maize and all of the soybean collections.

Two trainings have been done on conservation and evaluation using the Tsukuba International Course on Genetic Resources at NIAR. One has been successfully accomplished and the second has only recently started in February 1992.

2.2.3. Characterization and evaluation.

The Genetic Resources Committee of INIA has defined a three stage strategy of characterization and evaluation: a minimal, a basic and an advanced level. No research activities have been done. The first one is expected to start with the arrival of a Japanese expert end March 1992.

2.2.4. Regeneration and multiplication.

Several plant breeding programs have started to multiply fresh seeds to be stored during 1992. The following collections are beeing prepared: beans, maize and wheat at La Platina, beans, wheat and rice at Quilamapu, peas, rapeseed, and wheat at Carillanca. No special research activities have been done on multiplication. The first one is expected to start with the arrival of a Japanese expert end March 1992.

2.2.5. Documentation.

A computerized data base have been designed under the guidance of the Japanese expert Dr. Kumagai. A delay in developing the data base occurred due to the availability of the necessary computer sciences staff at La Platina. The base has been further improved and the necessary input/output programs are almost finished. The documentation of passport data of the soybean, dry bean and maize collection have been finished. Inventory and germination data have been already recorded for the soybean collection. Germination data have been recorded for the maize collection.

2.2.6. Policy and management.

Several meeting of INIA's plant breeders concluded with the establishment of a Genetic Resources Committee at the Institute level. This Committee includes the following members: Dr. R. Cortázar (wheat breeding, Professor of Genetics and Plant Breeding at Universities de Chile and Católica), Dr. I. Ramirez (wheat breeding), Dr. C. Muñoz (biotechnology), Dr. R. Madariaga (plat pathology), Ing. Agr. O. Paratori (maize breeding), and Dr. A. Cubillos (genetic resources). A first draft to establish INIA's genetic resources policies have been prepared and analyzed.

2.3. Exchange of data, information and materials.

Several of the Japanese experts on plant breeding and biotechnology have brought germplasm of grapes, asparagus, garlic, etc. A collection of native Chilean maize cultivars are ready to be exchanged with a Japanese Experiment Station. Several contacts have been established with other Latin American genetic resources programs: Argentina (INTA), Bolivia (Pairumani and IBTA), Brazil (EMBRAPA), Colombia (ICA), Ecuador (INIAP), Paraguay (CRIA), Uruguay (INIA). An international seminar was held as part of the inauguration program of the Base Bank.

2.4. General remarks.

The progress of the Project may be divided in time in two steps: Implementation and research. The years 1989 and early 1990 were devoted to the construction of buildings and facilities and to priorize and define the characteristics of the equipments to be supplied. The first scientific staff (Base Bank curator) was appointed end 1989 and left to Japan very soon for a 6 month training period. Research activities were planed to start 1990. A specific budget was requested to the Ministry of Agriculture, but was not granted as an additional item. A new BID/INIA Development project was suposed to be used to staff and support financially the project.

Chile changed government in March 1990. A new Executive President was appointed and new general agricultural policies were implemented at the Ministry of Agriculture in March 1990. The higher management staff of INIA was changed and the institution had to adapt its activities to the new policies. Furthermore, the new BID funded project had a slower development than expected. INIA had to conform to a reduced budgetary condition during 1992. All these facts produced a recession period that affected the Project, like any other activity in INIA, in terms of staff appointment and budget assignment.

A second scientific member was appointed at La Platina (National Coordinator and Active Bank curator) during 1990, a Technician and a third scientist (Active Bank curator) were appointed at La Platina and Carillanca during 1991. The lack of due appointments of Chilean Scientists and Technicians at the different Experiment Stations has not allowed to develop several research lines as well as to make a better use of further training possibilities.

3. Future activities.

3.1. Construction of buildings and supply of equipments.

The three Active Banks require backup refrigeration and airconditioning equipments. The use of a bar coding system seems to be required to manage properly the different accessions within the banks.

3.2. Research activities.

3.2.1. Exploration and collection.

A collection of Irish and sweet potatoes have been organized to be done with Japanese experts end March. Again genetic resources and potato researchers will be involved. Two collection expeditions have been already suggested to the Project: A collection of *Erodium* species and a collection of patagonian forage species. This last expedition is a proposal of Río Gallegos Experiment Station from INTA (Argentina), who expects to do a joint expedition. Both collection are of interest of INIA's Forage Research Program.

The *Bromus* collection may be of great value to determine the distribution of the Section *Ceratochloa* in Southern Chile.

Contacts with breeding programs other than INIA's envisage the possibility to receive genetic resources from Chile and other Latin American countries. CRIA from Paraguay expects to send their wheat and soybean collection to the Vicuña Base Bank for long storage preservation.

3.2.2. Conservation.

The seeds from the different plant breeding programs must be incorporated into the system. This requires that INIA provides an adequate staff at the different Stations. Both the Irish, sweet potatoes, strawberries and grape collections must be recorded and stored *in vitro*. Long term storing conditions must be studied. A tentative schedule to incorporate seeds into the Banks may be as indicated in table 1.

3.2.3. Characterization and Evaluation.

Most of the collections kept at INIA do not have any type of characterization. They do have some type of agronomic evaluation. Appropriate methods to do large scale characterization and evaluations must be developed. Characterization and evaluation are critical subjects as their accomplishment requires of an adequate funding of the different plant breeding programs. The possibility to use specially tagged funds allocated to the Genetic Resources Program of INIA and to be exclusively used by the plant breeding programs may help to overcome this difficulty.

The *Bromus* collection requires of at least a minimal characterization.

3.2.4. Regeneration and multiplication.

Minimal characterization and multiplication may be done simultaneously. Again, a critical point is the availability of an adequate funding of the different plant breeding programs to perform this activity. The production of forage seeds is very difficult as INIA does not have proper isolated greenhouses and screenhouses to handle these type of multiplications. A tentative schedule to multiply fresh seeds may be as indicated in table 2.

3.2.5. Documentation.

The data base must be used extensively. Fruit trees, vegetables and other similar species kept as field collections must be also recorded. The data base of the Base Bank seems to be a critical point that has to be overcome by the development of a special base to be run on PC's or the establishment of an electronic communication system with La Platina.

3.2.6. Policy and management.

A final document establishing INIA's policies on genetic resources must be accomplished.

3.3. Exchange of data, information and materials.

Preliminary manuals on genetic resources management must be prepared. Main subjects should be on collection, conservation and documentation. These manuals may be used as part of a short course on genetic resources management. An Index Seminum with the passport data of the existing collections must be also prepared. The preparation of a genetic resources catalogue of the garlic collection is in process and will also be published.

Exchange of information with other Latin American countries seems to be necessary to both share the experience and acquire new knowledge.

3.4. General remarks.

There is the perception that the Ministry of Agriculture has an increasing interest in genetic resources. An example of this interest is the request that INIA colaborates in the formulation of a national policy on genetic resources. The new BID development project of INIA started January 1992 and is expected that will overcome the lack of staff appointment and budgetary situation. The process of institutional changes due to the new governmental policies may induce changes in some of the research lines and the priorities of the crops to be considered. The emphasis on fruit tree and vegetable species may be shared with those related to small farmers agricultural systems and those able to reduce environmental degradation. In summary, it is expected that the Project may end having started almost all the proposed research lines except a few ones, although the original schedule may have not been accomplished.

Table 1. Tentative schedule of seed storing

Species	1992	1993
Rice	AC+BC	AC+BC
Wheat	AC	AC+BC
Oats	AC	AC+BC
Maize	AC+BC	
Barley	AC+BC	AC+BC
Beans	AC+BC	AC+BC
Lentils	AC	AC+BC
Chickpeas	AC	AC+BC
Peas	AC	AC+BC
Other dry legumes	AC	AC
Rapeseed	AC+BC	AC+BC
Soybeans	BC	BC
Sunflower	BC	BC
Forages	AC	AC

AC = Active collection BC = Base collection

Table 2. Tentative schedule of seed multiplication.

Species	1991-92	1992-93	1993-94
Rice	+	+	-
Wheat	+	+	+
Oats	+	+	-
Maize	+	-	-
Barley	+	+	-
Beans	+	+	-
Lentils	-	+	+
Chickpeas	-	+	+
Peas	-	+	+
Other dry legumes	-	-	+
Rapeseed	+	+	-
Soybeans	-	+	-
Sunflower	-	-	-
Forages	-	-	-

+ = Multiplication - = No multiplication

JICA-INIA GENETIC RESOURCES PROJECT
PROGRESS REPORT
BIOTECHNOLOGY

ACTIVITY	TARGET	PRESENT STATUS	REMAINING AC.
In vitro Conservation	In vitro collection of vegetatively propagated species	Collections already established: Potato, Sweet potato	Techniques to be established for garlic, and small fruits
Long term conservation techniques	Development of minimal metabolism conservation techniques with regeneration capacity	Only exploratory experiments have been conducted	Formal experiments to be conducted with garlic and small fruits
Germplasm exchange using in vitro techniques	Introduction of disease-free material using in vitro culture	Successful introduction of grape, strawberries, garlic, asparagus, pear, and other cultivars.	Introduction of cultivars of other fruit and vegetables
Utilization of cell engineering techniques	Speed-up and/or make more efficient plant breeding programs	Haploid breeding in rape & wheat. Embryo rescue in grape. Mass-propagation. Chromosome doubling. Virus-freeness	Application of these and other techniques to more species
Genetic Engineering	Direct introduction of virus and disease resistance to commonly used cultivars	Not yet initiated	Crops to be considered include mainly potatoes and melons
Use of biochemical markers	To characterize germplasm and associate biochemical markers to important agronomic traits	Not jet initiated	Crops to be considered include common beans and potatoes

CMS/cms

ESTABLISHMENT OF QUARANTINE SYSTEM.

1. SURVEY OF QUARANTINE SYSTEM IN OTHER COUNTRIES FOR RESEARCH MATERIALS.

   A) FINAL GOAL
   To survey on quarantine systems for genetic resources in the important genetic resources centers of neighboring countries.

   B) PRESENT STATUS
   Quarantine systems of Japan and some neighboring countries and international research centers have been surveyed. Visit of Japanese experts and training of Chilean counterparts in Japan have been done.

   C) ACTIVITIES ON REMAINING
   Visit of Japanese experts and training of Chilean counterparts in Japan will be done.

2. ESTABLISHMENT OF QUARANTINE PROTOCOLS FOR RESEARCH MATERIALS.

   A) FINAL GOAL
   To establish protocols of inspection for bacteria, virus, nematodes, etc for introduced research materials.

   B) PRESENT STATUS
   Less than 10% attainment

   C) ACTIVITIES ON REMAINDING
   Preliminary protocols related to introduced materials will be established.

3. CONFORMATION WITH NATIONAL QUARANTINE REGULATIONS.

   A) FINAL GOAL
   To adjust these protocols in conformation with the national quarantine regulations.

   B) PRESENT STATUS
   Less than 10% attaiment

   C) ACTIVITIES ON REMAINDING
   Above protocols will be examined and authorized by national quarantine system of SAG.

4. ESTABLISHEMENT OF A NATIONAL QUARANTINE SYSTEM FOR RESEARCH MATERIALS

A) FINAL GOAL
To established national quarantine system proper to the introduced genetic resources of INIA.

B) PRESENT STATUS
Less than 10% attainment

C) ACTIVITIES ON REMAINDING
Above protocols will be examined and authorized by national quarantine system of SAG.

5. DEVELOPMENT OF ADVANCED TECHNOLOGIES FOR DETECTION AND THERAPY

A) FINAL GOAL
To develop advanced techniques for detection, identification and therapy of unexpected pathogens and insects.

B) PRESENT STATUS
Less than 10% attainment

C) ACTIVITIES ON REMAINDING
Develop of the new techniques for pathogen deteccion.

Appendix ; II — 3. Utilization of genetic resources including biotechnology.

Crop	Area, hrs (main region)	Present Status (Objects)	Activity of Japanese Expert 1989 - 1991	1992 - 1993
Grape	47,562 (3,4,5,RM,6)	Over 1,000 hybrids obtained by the method of embryo resque are testing. E.E. La Platina. (Thompson Seedless; early maturity, ability for preservation, coloring). Hybrid plants are in the stage of individual and clonal selection. Sub E.E. Cauquenes. (Introduction of muscat aroma).	Chromosome boubling(Dr.Notsuka) this works continue using chilean varieties(Dr.Toyao).	Continuance following Notsuka's method.
Apple	23,059 (6,7)	Introduction		
Pear	15,324 (RM,6,7)	Introduction		
Kiwi	12,260 (5,RM,6,7)	Introduction		
Peach	10,149 (5,RM,6)	Introduction		
Plum 8,290, Avocado 7,991, Walnut 6,956, Nectarine 6,590, Orange 6,101, Lemon 6,025, Almond 3,748, Olive 3,024. Cherry 2,907, Raspberry 2,490, Chirimoya 1,175, Tuna 1,045. ·····etc.				
Total; 169,685 hectares (1989-1990).				
Tomato	17,808 (5,RM,6,7)	(Resistance to nematodes, diseas and post-harvest quality) Back crosses to chilean variety are carried out using two nematodes-resistant varieties.		
Corn	13,625 (1,5,RM,6)	Introduction		

Onion 9,042 (5,RM)	Mass selection were adopted to local varieties. (Resistance to blotting, size and color of balb, and taste of fresh onion).		
Bean 8,675 (5,RM)	Introduction		
Pumpkin 8,674 (RM,6)	Introduction		
Green pea 6,165 (5,RM)	Introduction		
Asparagus 5,940 (RM,7,8,10)	Introduction	Utirization of tetraploid, maspropagation of embriyogenic callus (Dr.Tanaka).	
Carrot 5,022 (5,RM), Melon 4,129, Lettuce 3,972, Watermelon 3,941, Fava bean 2,548, Artichoke 2,368,			
Garlic 2,373 (5,RM)	Clonal selection was done, methods of virus detecting are studing.	Chromosome boubling (Dr.Tanaka). Mass-propagation by "Shoot Primoduim method" (Dr.Toyao).	Research for invitro-masspropagation should be contiunue.
Chili pepper 2,260, Cabbage 1,916, Celery 1,400, Red beet 940, Cauliflower 913, • • • ect.			
Total; 12,963.hectares (1990 - 1991).			
Rapes	Large scale breeding are continued based on orthodox cross breeding. (High yeald, high quality of oil) E.E.Carillanca.	Haploid breeding method by the pollen-culture (Dr.Ookawa).	Technics will be transfer to breeding site.
Sunflower	Mass selection were used to develop new varieties.		
Forage crops		Theoritical and practical advise to the breeding (Dr.Fujimoto).	
Rice		Trancefer of cell engineering technics for plant breeding; anther culture (Dr.Oono)	

附属資料4. プロジェクト提出資料（専門家派遣、研修員受入れ、機材供与実績等）

DISPACH OF EXPERTS (LONG TERM)

	NAME (FIELD)	89	90	91	92	93
	MONTH	3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
(3)	Dr. S. SUZUKI (TEAM LEADER, GENETIC RESOURCE MANAGEMENT)					
	Dr. T. TOYAO (COORDINATOR, PLANT BREEDING)					
	Sr. Y. OKAWARA (COORDINATOR)					

DISPACH OF EXPERTS (SHORT TERM)

FISCAL YEAR	NAME (FIELD)	89	90	91	92	93
	MONTH	3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
89 (3)	Sr. Y. ASAKURA (DESIGN OF QUARANTIN GREENHOUSE)					
	Sr. G. MOTOYAMA (DESIGN OF QUARANTIN GREENHOUSE)					
	Dr. K. NOTSUKA (GRAPE BREEDING)					
90 (6)	Dr. K. KUMAGAI (DESIGN OF DATA BASE SYSYTEM)					
	Sr. Y. ASAKURA (CONSTRUCTION OF QUARANTINE GREENHOUSE)					
	Dr. Y. OKAWA (BIOTECHNOLOGY ON RAPE SEED BREEDING)					
	Sr. M. TANAKA (BIOTECHNOLOGY ON VEGETABLE BREEDING)					
	Sr. G. MOTOYAMA (CONSTRUCTION OF QUARANTINE GREENHOUSE)					
	Sr. R. KIMURA (GENETIC RESOURCE MANAGEMENT)					
91 (2)	Dr. F. FUJIMOTO (FORAGE CROP BREEDING)					
	Dr. K. ONO (BIOTECHNOLOGY ON RICE BREEDING)					

TRAINING OF PERSONNEL IN JAPAN

FISCAL YEAR	PERSONNEL (FIELD)	89 (7–12)	90 (1–12)	91 (1–12)	92 (1–12)	93 (1–12)
1989 (3)	Mr. CLAUDIO ORTIZ (RESEARCH MANAGEMENT)	9/24 – 10/12				
	Mr. FERNANDO ORTEGA (COLLECTION AND UTILIZATION OF FORAGE CROP GENETIC RESOURCES)		3/21 — 9/13			
	Mr. MOISES ESCAFF (MANAGEMENT OF GENETIC RESOURCES AND UTILIZATION OF BIOTECHNOLOGY ON VEGETABLES)		3/26 — 5/19			
1990 (5)	Mr. CESAR BERTRAND (GENETIC RESOURCES MANAGEMENT)		5/14 — 10/28			
	Mr. JORGE VALENZUELA (MANAGEMENT OF GENETIC RESOURCES AND UTILIZATION OF BIOTECHNOLOGY ON FRUIT TREE BREEDING)		8/06 – 8/29			
	Mr. GAMALIER LEMUS (FRUIT TREE BREEDING)		6/09 — 8/29			
	Mr. AGUSTIN ALJARO (PLANT PHYSIOLOGY)		6/09 — 7/09			
	Mr. GUIDO HERRERA (QUARANTINE SYSTEM)			3/31 — 5/21		
1991 (4)	Mr. MARIO MELLADO (WHEAT BREEDING AND PLANT GENETIC RESOURCES MANAGEMENT)			7/18 — 8/18		
	Mr. CARLOS MUNOZ (PLANT BIOTECHNOLOGY)			7/18 — 8/20		
	Mr. HIRAM GROVE (RESEARCH MANAGEMENT)			7/20 – 8/ 4		
	Mrs. MALCELA BERRIOS (COLLECTIVE COURSE ON GENETIC RESOURCES)				2/29 — 8/31	

LIST OF EQUIPMENT

LABOLATRY OF BIOTECHNOLOGY

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US$	TOTAL PRICE. US$	USE	MAINTE-NANCE	REMARKS
	PLANT GROWTH ENVIROMENTAL CHAMBAR	2	12.015	24.030	A	A	
	REFRIGERATOR	1	4.603	4.603	A	A	
	LAMINAR FLOW HOOD	1	8.422	8.422	A	A	
	AIR CONDITIONER	3	980	2.940	A	A	
	LIGTHING SYS FOR TISSUE CULTURE	1	5.108	5.108	A	A	
	REPETITIVE DISPENSER	1	1.179	1.179	A	A	
	ADJUSTABLE BOTTLETOP DISPENSER	6	439	2.634	A	A	
	HYGROMETER/THERMOMETER	3	36	108	A	A	
	HYGROTHERMOGRAPH	3	580	1.740	A	A	
	PIPET WASHING ASSEMBLY	1	2.321	2.321	B	D	
	PERSONAL COMPUTER	1	10.213	10.213	A	A	
	STEREOMICROSCOPE	1	5.136	5.136	A	A	
	WATER PURIFICATION SYSTEM	1	4.676	4.676	A	A	
	BALANCE	1	2.396	2.396	A	A	
89	ANALYTICAL BALANCE	1	2.877	2.877	A	A	
	POTENTIOMETER	1	1.917	1.917	A	A	
	MICROCENTRIFUGE	1	2.288	2.288	A	A	
	REFRIGERATED MICROCENTRIFUGE	1	6.571	6.571	A	A	
	FREEZER	1	5.090	5.090	A	A	
	ADJUSTABLE MICROPIPETES	6	635	3.810	A	A	
	EPPENDORFF TUBES.1.5ml	10	57	570	A	A	
	EPPENDORF TUBES.0.5ml	20	54	1.080	A	A	
	DISPOSABLE TIPS.0-200ml	10	39	390	A	A	
	DISPOSABLE TIPS.200-1000mL	10	50	500	A	A	
	COREX TUBES 30 WITH SCREW CAP	36	14	504	A	A	
	COREX 30 ADAPTER	12	13	156	A	A	
	COREX TUBES 15	36	10	360	A	A	
	COREX 15 ADAPTER	12	13	156	A	A	
	MAGNETIC STIRRER	2	1.021	2.042	A	A	
	ORBITAL SHAKER	1	3.087	3.087	A	A	
	DNA-SEQUENCE GEL ELECTRO PHORESIS	1	23.051	23.051	B	A	
	HOMOGENIZER POLYTRON	1	4.638	4.638	A	A	
	HORIZONTAL AUTOCLAVE	1	11.678	11.678	A	A	
	MIXER WITH HOLLOW THROUGSHAFT	1	918	918	A	A	
	INVERTED MICROSCOPE	1	16.514	16.514	A	A	
	ULTRASONIC CLEANER	1	611	611	A	A	
90	AIR PURIFIER	3	1.175	3.525	A	A	
	PHOTOMETER	1	346	346	A	A	
	CAMERA SYSTEM	1	3.009	3.009	A	A	
	SAFTY FLOW FUME HOOD	1	6.989	6.989	A	A	
	LIGHT MICROSCOPE	1	33.186	33.186	A	A	
	STEREOMICROSCOPE FOR CAMERA	1	5.895	5.895	B	A	
	WATER STILL	1	2.537	2.537	A	A	
	ULTRACENTRIFUGE	1	78.574	78.574	A	A	
	TOTAL			298.376			

LIST OF EQUIPMENT

BASE BANK

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US$	TOTAL PRICE. US$	USE	MAINTE-NANCE	REMARKS
89	AIR CONDITIONING SYSTEM. EMERGENCY POWER GENERATOR AND INSULATION PANELS	1	80.679	80.679	A	A	
	TV MONITORING SYSTEM	1	4.757	4.757	A	A	
	ENVELOPE SEALER	1	1.450	1.450	B	A	
	SEED CONTAINING ENVELOPE	1	2.320	2.320	B	A	
	SEED CONTAINING BOTTLES	2	9.700	19.400	A	A	
	MOISTURE TESTER	2	4.380	8.760	A	A	
	OTTAWA SEED BLOWER	1	5.835	5.835	A	A	
	ANALYTICAL BALANCE	1	2.877	2.877	A	A	
90	CONSOLE GERMINATOR	1	11.018	11.018	A	A	
	SEED COUNTER	2	6.595	13.190	A	A	
	STEREOMICROSCOPE	1	3.605	3.605	B	A	
	CENTRIFUGAL SEED DIVEIDER	1	6.400	6.400	A	A	
	PERSONALCOMPUTER	1	8.991	8.991	A	A	
	4 WHEEL DRIVE PICK-UP TRUCK	1	13.900	13.900	A	A	
TOTOAL				183.182			

ACTIVE BANK LA PLATINA

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US$	TOTAL PRICE. US$	USE	MAINTE-NANCE	REMARKS
89	AIR CONDITIONING SYSTEM. EMERGENCY POWER GENERATOR AND INSULATION PANELS	1	98.306	98.306	A	A	
	SEED CONTAINING BOTTLES	2	9.700	19.400	A	A	
	SEED CONTAINING ENVELOPE	1	2.320	2.320	B	A	
	ENVELOPE SEALER	1	1.450	1.450	B	A	
	MOISTURE TESTER	2	4.380	8.760	A	A	
	SEED COUNTER	1	7.890	7.890	A	A	
	ANALYTICAL BALANCE	1	2.877	2.877	A	A	
	CENTRIFUGAL SEED DIVEIDER	1	6.400	6.400	A	A	
	AIR PULS SEED DIVEIDER	1	4.908	4.908	A	A	
	STATIONWAGON	1	21.159	21.159	A	A	
	LABOLATRY CLIPPER	1	13.080	13.080	A	A	
90	SEED COUNTER	2	6.595	13.190	A	A	
	DIGITAL MOISTURE TESTER	1	2.326	2.326	A	A	
	CONSOLE GERMINATOR	1	18.907	18.907	A	A	
	STEREOMICROSCOPE	1	3.605	3.605	A	A	
	OTTAWA SEED BLOWER	1	5.835	5.835	A	A	
	PERSONALCOMPUTER	1	8.991	8.991	A	A	
	4 WHEEL DRIVE STATIONWAGON	1	19.000	19.000	A	A	
	GRAVITY SEPARATOR	1	32.968	32.968	B	A	
TOTOAL				283.800			

LIST OF EQUIPMENT

ACTIVE BANK CARILLANCA

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US$	TOTAL PRICE. US$	USE	MAINTE-NANCE	REMARKS
	AIR CONDITIONING SYSTEM. EMERGENCY POWER	1	88,570	88,570	A	A	
8 9	GENERATOR AND INSULATION PANELS						
	MOISTURE TESTER	1	4,380	4,380	A	A	
	SEED CONTAINING BOTTLES	1	9,700	9,700	A	A	
	SEED CONTAINING ENVELOPE	1	2,320	2,320	B	A	
	ENVELOPE SEALER	1	1,450	1,450	A	A	
9 0	DIGITAL MOISTURE TESTER	1	2,326	2,326	A	A	
	CONSOLE GERMINATOR	1	11,018	11,018	A	A	
	SEED COUNTER	2	6,595	13,190	A	A	
	STEREOMICROSCOPE	1	3,605	3,605	A	A	
	OTTAWA SEED BLOWER	1	7,024	7,024	A	A	
	CENTRIFUGAL SEED DIVEIDER	1	6,400	6,400	A	A	
9 1	PERSONALCOMPUTER	1	6,700	6,700	A	A	
	4 WHEEL DRIVE PICK-UP TRUCK	1	14,000	14,000	A	A	
	TOTOAL			206,807			

ACTIVE BANK QUILAMAPU

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US$	TOTAL PRICE. US$	USE	MAINTE-NANCE	REMARKS
	AIR CONDITIONING SYSTEM. EMERGENCY POWER	1	88.444	88.444	A	A	
8 9	GENERATOR AND INSULATION PANELS						
	MOISTURE TESTER	1	4,380	4,380	A	A	
	SEED CONTAINING BOTTLES	1	9,700	9,700	B	A	
	SEED CONTAINING ENVELOPE	1	2,320	2,320	A	A	
	ENVELOPE SEALER	1	1,450	1,450	A	A	
9 0	DIGITAL MOISTURE TESTER	1	2,326	2,326	A	A	
	CONSOLE GERMINATOR	1	11,018	11,018	A	A	
	SEED COUNTER	2	6,595	13,190	A	A	
	STEREOMICROSCOPE	1	3,605	3,605	A	A	
	OTTAWA SEED BLOWER	1	7,024	7,024	A	A	
	CENTRIFUGAL SEED DIVEIDER	1	6,400	6,400	A	A	
9 1	PERSONALCOMPUTER	1	6,700	6,700	A	A	
	4 WHEEL DRIVE PICK-UP TRUCK	1	14,000	14,000	A	A	
	TOTOAL			170,557			

QUARANTINE GREENHOUSE

YEAR	EQUIPMENT	QUANTITY	UNIT PRICE. US$	TOTAL PRICE. US$	USE	MAINTE-NANCE	REMARKS
9 0	HIGH SECURITY GREENHOUSE	1	75,222	75,222	B	A	
	MEDIUM SECURITY GREENHOUSE	1	59,153	59,153	B	A	
	TOTOAL			134,375			

TOTAL AMOUNT 1,286,038US$

LOCAL COST AFFAIRS OF JICA(US$)

FISCAL YEAR	GENERAL EXPENCE	INTERNATIONAL EXCHANGE OF TECHNOLOGY	PUBLICATION	SEMINAR	TOTAL
89	40,310	8,690	3,025		52,025
90	32,978	-	-	3,522	36,500
91	35,856	-	-	-	35,856
TOTAL	109,144	8,690	3,025	3,522	124,381

EXPENCES OF INIA FOR GENETIC RESOURCES PROGRAM AND BIOTECHNOLOGY PROGRAM

YEAR	GENETIC RESOURCES PROGRAM	BIOTECHNOLOGY PROGRAM	CONSTRUCTION	INFRA-STRUCTURE	TOTAL
89	2,089	1,243			
90	23,038	6,789			
91	39,028	8,743			
TOTAL	64,155	16,775	539,051	12,505	632,486

附属資料5. 実験条件での植物体の国際的交流と管理に関してのSAGとINIA INIA間の協定（西文）

CONVENIO ENTRE EL SERVICIO AGRICOLA Y GANADERO

Y EL INSTITUTO DE INVESTIGACIONES AGROPECUARIAS

SOBRE INTERNACION Y MANEJO DE GERMOPLASMA CON FINES EXPERIMENTALES

I. CONSIDERANDO:

a. La necesidad imperiosa que tiene el país para acceder en forma expedita y oportuna a germoplasma de interés para el mejoramiento genético de especies cultivadas o para otros fines de investigación;

b. El importante esfuerzo que el país ha hecho para establecer las condiciones físicas y de equipamiento que garanticen el debido resguardo de nuestro patrimonio sanitario vegetal;

c. La existencia de profesionales calificados con capacidad técnica en el manejo de los materiales internados; y

d. Las disposiciones legales dictadas por la División de Protección Vegetal del Servicio Agrícola y Ganadero;

II. SE ACUERDA:

a. La División de Protección Agrícola del Servicio Agrícola y Ganadero autoriza el establecimiento de una Estación Cuarentenaria en la Estación Experimental La Platina del Instituto de Investigaciones Agropecuarias para la internación de germoplasma vegetal y otros materiales para el diagnóstico de los mismos destinados a la investigación agrícola.

b. La internación de germoplasma se hará conforme a las disposiciones legales vigentes y estará reglamentada por las disposiciones acordadas en el presente Reglamento.

c. El material deberá venir acompañado del Certificado Fitosanitario que ampare la partida donde se establezcan las declaraciones adicionales exigidas por el SAG en la resolución de internación.

d. El material que llegue amparado por el correspondiente Certificado Fitosanitario será sometido a las medidas cuarentenarias de post-entrada normales exigidas por el SAG.

e. El material que no pueda cumplir con los requisitos indicados en el punto c. anterior será sometido necesariamente a una cuarentena bajo regimen excepcional empleando las instalaciones especialmente existentes en la Estación Cuarentenaria de la Estación Experimental La Platina , debiéndo realizarse las observaciones o análisis que correspondan, por el SAG o por el personal de INIA que el Servicio expresamente autorice para ejercer esta labor.

f. El INIA, como depositario de la confianza de la División de Protección Agrícola del SAG, extremará las precauciones en el manejo del material en cuarentena, comprometiéndose a informar o consultar a la División acerca de: la detección de eventuales plagas o enfermedades, la supervivencia del material, o cualquier duda que surja respecto al manejo de los materiales sometidos a cuarentena.

III. REGLAMENTO PARA LA INTERNACION Y MANEJO DE GERMOPLASMA CON FINES EXPERIMENTALES BAJO CONDICIONES DE CUARENTENA EXCEPCIONALES.

1. El INIA, a través del Director de la Estación Experimental La Platina, solicitará, por escrito, a la División de Protección Agrícola del SAG toda internación de germoplasma vegetal con fines de investigación, indicando las especies y variedades a internar, el tipo de material (semillas, tubérculos, yemas, estacas enraizadas, ramillas, plántulas in vitro, etc.), la cantidad aproximada de material a internar, la fecha estimada de llegada al país, y el origen del material (proveniente de bancos de germoplasma, colectado en estado silvestre, colectado en campos de cultivo, proveniente de estaciones experimentales, de viveros comerciales, etc.).

   Un procedimiento similar se emplerá en el caso de materiales para el diagnóstico de enfermedades y plagas (plantas indicadoras, antisueros, testigos positivos, etc.) destinadas a salvaguardar la sanidad del germoplasma de interés agrícola.

2. El INIA está facultado para elevar solicitudes de materiales destinados exclusivamente para uso por la institución. En casos excepcionales, cuando su capacidad así se lo permita, podrá solicitar la internación de materiales destinados a otros servicios dependientes del Ministerio de Agricultura.

3. El puerto de entrada al país será exclusivamente el Aeropuerto Arturo Merino Benítez de la Región Metropolitana.

4. Será responsabilidad de la División de Protección Agrícola informar a la Dirección Regional Metropolitana del SAG sobre el otorgamiento de los permisos de importación y de tomar las medidas para que la inspección del material internado sea hecha oportuna y expeditamente en la Estación Cuarentenaria de la Estación Experimental La Platina.

5. Los materiales internados, a su arribo al país, serán exclusivamente manipulados en la Estación Cuarentenaria, donde serán inspeccionados por el personal del SAG o por el personal del INIA que el Servicio expresamente autorice para ejercer esta labor.

6. En el caso que el material a internar requiera ser sometido a cuarentena de post-entrada especial, esta condición deberá establecerse en la Resolución de Internación que otorgue laDivisión de Protección Agrícola.

7. El inspector podrá recomendar tratamientos fitosanitarios (desinfección, fumigación, terapia, etc.) o la destrucción del material, si lo estima necesario. Estos tratamientos se realizarán exclusivamente en las instalaciones de la Estación Cuarentenaria por personal autorizado del INIA a sugerencia del de SAG.

Se considerá parte de la Estación Cuarentenaria al Laboratorio de Biotecnología Agrícola de la Estación Experimental La Platina en el caso que los tratamientos requieran de una terapia por cultivo de tejidos. Igualmente serán consideradas las instalaciones de cámaras climáticas que pudieren necesitarse para la realización de estos procesos.

El manejo de este material, en instalaciones fuera de la Estación Cuarentenaria y dentro de la Estación Experimental La Platina, sólo se realizará previa comunicación expresa al Servicio.

8. Los materiales autorizados para ser mantenidos bajo regimenes de alta seguridad o de seguridad contra insectos deberán ser cultivados exclusivamente en la Estación Cuarentenaria en las condiciones y por el tiempo especificados por la División de Protección Agrícola del SAG.

9. El SAG podrá inspeccionar el material en cuarentena las veces que lo estime conveniente, señalando por escrito las observaciones y recomendaciones que estas inspecciones le merezcan.

10. El INIA deberá solicitar por escrito el levantamiento del regimen cuarentenario a la División de Protección Agrícola del SAG. La solicitud deberá indicar las razones que hacen recomendable el levantamiento de la cuarentena, el uso que tendrá el material y su distribución.

11. El INIA podrá disponer libremente del germoplasma una vez autorizado el levantamiento de la cuarentena.

12. El INIA no podrá utilizar la Estación Cuarentenaria para otorgar servicios a terceros , a excepción de los servicios dependientes del Ministerio de Agricultura y cuando así se acuerde en forma expresa.

附属資料6.

実験条件での植物体の国際的交流と管理に関しての SAGとINIA間の協定（和訳抄）

CONVENIO ENTRE EL SERVICIO AGRICOLA Y GANADERO Y EL INSTITUTO DE INVESTIGACIONES AGROPECUARIAS SOBRE INTERNACION Y MANEJO DE GERMOPLASMA CON FINES EXPERIMENTALES

[実験条件での植物体の国際的交流と管理に関してのSAGとINIA間の協定]

注：SAG（農牧サービス公社：農業省の中の1部門で動植物防疫及び資源保護を担当）

I. 前文：

（和訳は省略）

II. 協定：

a. SAGの農業保護部は、INIAのLa Platina試験場内に隔離施設を設置することを許可する。これは農業研究のためのgermoplasma vegetalと同研究の診断（検定）のために使用されるその他の物件の輸入を許可する。

b. Germoplasmaの輸入に関しては、現行規定と本協定に定めるところに従うものとする。

c. 輸入物件には国際協定に従ってSAGの要求する輸出国からの申告書に附けられる検疫証明書が伴われなければならない。

d. 検疫証明を有する物件は、SAGの要求する通常の輸入後の隔離処理を受ける。

e. 前項cの条件を充していないものについては、必須条件としてLa Platina試験場に特設されている隔離施設において特別な隔離処理を受けねばならない。そこではSAGの職員またはSAGがこの作業のために特に認知したINIAの職員によって、監視または分析されるものとする。

f. INIAはSAGの農業保護部に信任された機関として、隔離中の物件の管理について最大の注意を払う。害虫、病菌、物件の保存、またはその他隔離物件の管理について、疑いの生じた場合、直ちにSAGに報告または相談しなければならない。

III. 研究目的のため、特別隔離条件で輸入されるgermoplasmaの輸入とその管理についての規定

1. INIAはLa Platina試験場長名で、SAGの農業保護部で研究目的でなされるgermoplasmaの輸入について、以下の諸項目を明記して許可を得なければならない：

・輸入物件の品種

・タイプ（種子、球根、塊茎、枝、試験管内培養中、等）

・大体の量

・到着期日

・産出地（バンク、野生原野、農場、試験場、市販、等）

（チリの）農業のため、また有益なgermoplasmaの健全性を保全するため、同様の事が、病害虫の診断用の物件（検定植物、antisueros、testigos positivos、等）にも適用される。

2. INIAは自己の研究機関のために申請書を提出することができる。特別な場合には、（隔離施設の）許容量が許す限りにおいて、農牧省に属する他の機関のために申請することができる。

3. 国内への搬入場所はサンチャゴ国際空港のみとする。

4. SAGの農業保護部は、輸入許可及び輸入物件が適宜速やかに検査の手続きをとり、INIAのLa Platina試験場内の隔離施設においてなされるようにSAGの首都圏本部に報告する責任がある。

5. チリへの到着後の輸入物件は、隔離施設においてのみ取り扱われ、そこでSAGの職員、または特にその仕事のためにSAGより任命されたINIAの職員が検査を行う。

6. もし輸入する物件が、輸入後の特別隔離処置を要する場合、その可否の決定は、SAGの農業保護部が与える輸入許可に示されるものである。

7. 検査官は検疫処置（消毒、散布、治療等）または必要とされた場合、物件の破壊について勧告することができる。これらの処置は、隔離施設においてのみ実施することができ、それはSAGの勧告に従って任命されたINIAの職員が行う。

もしこれらの処置が組織培養を必要とする場合には、La Platina試験場内のバイテク実験室もこの隔離施設の一部とみなす。これらの処置（治療）のプロセスに必要な場合、camaras climaticas（調温庫？）も同様である。

これらが、試験場内ではあるが隔離施設以外でなされる場合、前もってSAGにその旨連絡した上で行うことができる。

8. 高度の安全管理を条件に許可された物件、または害虫に対する安全を要する物件は、隔離施設においてのみ、また、SAGの農業保護部の指示により特定期間行う。

9. SAGは必要とみなされる度に、隔離施設にある物件の監査をすることができる。この視察の結果又は勧告は書式で報告される。

10. INIAは、隔離管理の終了をSAGの農業保護部に対して書式で請願しなければならない。その請願書には次の事項を明記する：

・隔離終了を勧告する理由

・物件の用途

・配布先

11. INIAは隔離が終了するや、自由にgermoplasmaを処置することができる。

12. INIAは隔離施設を第三者へのサービスに使用することはできない。但し、農牧省に属するものについては、明らかに協定されたサービスは例外とする。

JICA