

4.1.4 Future prospects

Judging from the rich spectrum of genetic diversity in this country, exploration and collection activities should be given more emphasis in the near future. Systematic plans for collection and introduction should accordingly be required. For instance, establishment of crop distribution maps, planning for making priority crop species as targets, and functioning of crop coordination system should be promoted and supported.

4.2 Classification

4.2.1 Identification

All the accessions collected/introduced were identified at the species level. In this field the PGRC has collaborative and cooperative relationships with Peradeniya Botanical Gardens and the Peradeniya University. PGRC plant codes were applied to the accessions after identification of species.

4.2.2 Classification

The techniques of phenol reaction test and alkali test are being utilized with the aim of classifying the Sri Lankan rice accessions. With similar objectives electrophoretic techniques are also being used by the staff of the PGRC on potato, onion, rice and sesame.

4.3 Evaluation

4.3.1 Preparation of descriptor lists

41 crop descriptors have been prepared for characterization of germplasm as the first standard, out of which 37 are being completed and ready for printing and distribution. Four are still in the draft form and need final revision. These descriptor lists are reduced versions of IBPGR's. Although the characterization data obtained so far are recorded in the format of IBPGR descriptors, the data can easily be translated in that of the PGRC descriptors.

The 37 crops are as follows :

Rice	Groundnut	Tomato
Maize	Chickpea	Okra
Sorghum	Lentil	<u>Cucumis sativus</u>
Finger millet	Lima bean	<u>Cucumis melo</u>
Proso millet & small millet	Lablab bean	Pumpkin
Foxtail millet	Capsicum	Ash pumpkin
Kodo millet	Sesame	Luffa
Mungbean	<u>Brassica juncea</u>	Snake gourd
Black gram	<u>Phaseolus vulgaris</u>	Bitter gourd
Rice bean	Yardlong bean	Bottle gourd
Cowpea	Winged bean	Amaranthus
Soybean	Sword bean & jack bean	
Pigeonpea	Brinjal and related species	

Descriptors of the following four crops are in draft form :
Papaya, pineapple, banana and mango.

4.3.2 Characterization

The major part of germplasm characterization was carried out by the evaluation unit of the PGRC. Because of the limited area of the PGRCs fields, 1752 rice accessions were characterized at CRBS Batalagoda, RARC Bombuwela, RARC Maha Illuppallama and ARS Ambalantota (sub station of RARC Angunakolapelessa). A total of 3899 accessions were characterized (Tables 16).

The project research programme could not be carried out fully during the period 1988-1990 due to social unrest.

4.3.3 Evaluation for useful traits

Accessions were evaluated for useful agronomic traits such as resistance to important pests and diseases with the cooperation of breeders, entomologists and pathologists of the RARCs.

Under natural infestation conditions, okra accessions were screened for resistance to yellow vein mosaic virus at RARC Bombuwela, collar rot in cowpea and stem borer (Chilo partellus) in maize at RARC Maha Illuppallama, and bacterial wilt (Pseudomonas solanacearum) in brinjal at PGRC. Mung bean accessions were screened for beanfly (Ophiomyia phaseoli) resistance in the greenhouse under artificial infestation conditions at CARI. Tomato accessions having firm fruits with thick pericarp and resistance to concentric and radial cracking were identified at CARI.

Cross compatibilities of wild Solanum species with brinjal and those of wild Oryza species with cultivated rice are being evaluated at the PGRC.

4.4 Conservation

4.4.1 Seed conservation

Seed conservation system has been greatly improved by development of methodologies on seed physiology. Number of accessions collected is shown in Table 14. This number is below the set target of 15,000. The reasons for the drawback are (1) activities of the project during the initial stages were slow (2) the situation in the country during 1989 was not favourable for field activities (3) drying system was not properly functioning and therefore drying of seed samples has taken longer period (4) the number of seed samples that reach the conservation unit during certain months of the year is too large to handle.

A programme has been initiated to re-test stored material for their viability and germination. Recommendations given by other genebanks are followed in this respect. However, research is required to determine the critical period for re-testing and rejuvenation of various crop species.

For effective management of the collections, the following methodologies have been developed to suit the specific needs of the national genebank :

- a) Preparation of genebank procedure and guidelines for handling seeds in the genebank for enhancing the operational flow of germplasm.
- b) Seed drying is the most critical aspect of seed conservation. A two stage slow drying process using silica gel was developed and is being applied for safe drying of genebank accessions and for the preparation of seed drying curves.
- c) Achieving humidity control in the storage chambers using a silical gel system.
- d) Control of storage pests using a combination of temperature and humidity.
- e) Genebank layout and location system was developed using a crop specific minimum seed requirement and storage criteria.
- f) Germination test methods and criteria by adapting ISTA standards to suit the genebank conditions.
- g) Pre-conditioning treatments to ultradry seeds from genebank to overcome imbibition injury and enhance germination.
- h) Periodic viability monitoring of stored accessions.
- i) Germplasm distribution criteria.

Research of seed physiology has been incorporated into the development of methodologies :

- a) A suitable storage temperature for bitter gourd (M. charantia) seeds was investigated. The most suitable storage temperature for bitter gourd seeds was found to be 15°C.
- b) Storage behaviour of bitter gourd (M. charantia) seeds was identified as a form of recalcitrance.
- c) Storage behaviour of citrus species :
Lime (C. aurantifolia) and Lima (C. hystrix) seeds show orthodox behaviour and sweet orange (C. sinensis) and mandarin (C. reticulata) seeds show recalcitrant behaviour.
- d) Dormancy breaking treatments for thumba karawila (M. dioica)
A successful dormancy breaking treatment for thumba karawila (M. dioica) was identified as high temperature (60°C, 48 hours).
- e) Viability monitoring intervals for 20 crops were finalized.
- f) Fumigation effect on seed viability was investigated and low fumigant dosages were recommended.

Constraints experienced are as follows :

- a) Design defect in the can containers for base collection was detected and 25,000 can containers were replaced in August 1990 by the Japanese supplier.
- b) Unavailability of a suitable low temperature, low humidity drying system continues to decrease genebank incorporation rate.
- c) A small amount of duplicate material of the original base collection needs to be stored as a safety measure.

4.4.2 In-vitro conservation

Culture protocols were developed for short- and medium-term conservation of a number of root and tuber crops - potato, sweet potato, cassava, Dioscorea, aroids and Solenostemon (innala). In vitro induction of microtubers of potato, which can be kept viable for at least 2 years, and their subsequent use for conservation was studied. The number of accessions conserved in vitro is given in Table 18.

The following methodologies have been developed :

- a) Rapid multiplication and acclimatization : Culture procedures for large-scale multiplication of banana, pineapple, Gloriosa, aloe and potato were perfected. Techniques are being developed for avocado, jak and papaya.

- b) Methods were perfected for regeneration of plants from cultured leaf tissues of *Solenostemon (innala)*. Studies are being carried out to perfect tissue culture techniques for tomato.
- c) Callus culture : Culture media were developed for establishment of callus and cell suspensions from leaf-base tissue of several varieties of banana. Somatic embryos were formed in these cultures. Studies are being continued to raise plants from these embryos.
- d) Anther and pollen culture : With the aim of providing new genotypes for crop improvement, research was carried out on perfection of regeneration from anthers of crop plants. Culture media were perfected for anther culture of indica rice and F1 crosses of indica x japonica. Embryo rescue techniques were perfected for crosses of cultivated and several wild species of rice.
- e) Protoplast culture : Due to lack of a suitable centrifuge and some of the necessary chemicals it was not possible to develop culture protocols for protoplasts of vegetatively propagated crops. However, it was possible to isolate protoplasts from leaf tissues of sweet potato, *Solenostemon (innala)* and pineapple. Culture techniques were perfected for establishment of microcalli from cultured protoplasts of sweet potato.

Progress made in in-vitro conservation is excellent. There is a need to do more research in this area in the future, so that a number of crop species which are difficult to conserve as seeds could be conserved. Both conservation and research are being done in the same laboratory. Space and facilities are not adequate. It was also felt that research should be initiated on cryopreservation using liquid nitrogen.

Vegetative conservation in the field is not carried out by the PGRC. However, CARI Gannoruwa, maintains the germplasm of many root and tuber crops. Also other RARCs and DOA farms maintain germplasm of various fruit trees. A programme has been initiated to establish field genebanks for various fruit crops in RARCs.

4.5 Multiplication

The majority of germplasm was multiplied and characterized by the evaluation unit of the PGRC. Their progress during the period from April 1989 to April 1992 is given in Table 17. A total of 6441 accessions of germplasm were multiplied. The projected targets could not be achieved during the period 1988-1990 due to the situation that prevailed in the country.

Multiplication of rice germplasm has been carried out in close collaboration with CRBS Batalagoda, RARCs at

Bombuwela and Maha Illuppallama and ARS Ambalantota. The PGRC supports these regional centres by providing some equipment and capital expenditure for fencing, etc.

Methods have been developed to produce pure seeds of many crop varieties.

- a) Flowering behaviour of cucumber, luffa, snake gourd and pumpkin under local conditions was studied and the best time for pollination for seed collection of these highly cross-pollinated crops was worked out.
- b) Maintenance of the genetic purity of chillies was studied. It was found that outcrossing could be prevented by growing accessions in an insect proof greenhouse or in cages covered with fine mesh.

In many crops outcrossing percentage is very high and needs specific techniques and trained personnel to produce self-pollinated seeds. Collaborative activities with other regional centres should be strengthened in the future.

4.6 Data processing

An information management system using Informix SQL and 4GL was designed and developed to meet specific requirements of PGRC.

The progress made is good and most of the passport data has been entered in the data base. An example of some information on passport data is given in Table 19. But only limited data on characterization has been entered and this drawback is mainly due to the operations capacity of the computer system. A smoother flow of information from the other units will meet further user requirements.

- a) Passport data can be efficiently managed with the programmes that were developed with Informix 4GL. Numerical codes were prepared to specify crop species accurately and incorporated into database. Passport data are entered for accepted samples (Table 20).
- b) Programmes were developed to manage the storage data of accessions. 1288 accessions were entered as base collection. In this system quantity, location and germination data are recorded when seed samples are stored. A seed inventory system is included to monitor the flow of seeds into and out of the cold storage and current status of seed quantity in the storage.
- c) Programmes were developed to manage characterization data of 17 crop species. 994 accessions were entered as characterization data.
- d) Reports are issued with available information for PGRC use when requests are made. Programmes were developed to publish lists of accession and characterization data for the benefit of the breeders and researchers.

4.7 Germplasm distribution/exchange/utilization

585 accessions of germplasm were issued to RARCs and other local institutions from 1988 to 1992 to be used for crop improvement research (Table 21).

Germplasm exchanged as part of joint collaborative exploration missions are outlined in Table 13.

Seeds have been distributed and exchanged with several national and international organizations. However, exchange of germplasm with a few countries was not very satisfactory because some of these countries have not sent the requested germplasm requested by the PGRC.

The distributed germplasm has been utilized by national researchers and breeders. However, only 2 years have elapsed since distribution of germplasm commenced and it is premature to get feedback from the institutes. The policy is to request these institutes to send any significant research findings and publications to the PGRC so that they can provide this information to any other interested parties.

5. Impact of the Project

The PGRC is expected to contribute to national agricultural development in Sri Lanka in the long term mainly by promoting crop improvement.

Before the establishment of the PGRC, there was no institution in Sri Lanka responsible for collection and conservation of the rich indigenous crop genetic resources. During this period it is likely that a large number of valuable species would have been lost for ever due to high rate of genetic erosion. However, with the establishment of the PGRC, this adverse trend has been arrested at least as far as the main food crops are concerned. Valuable genetic resources including indigenous germplasm of rice (the staple food of the country) with their wild relatives are being conserved at the PGRC.

The PGRC has made an impact on improving the base for breeding work conducted in the country by providing germplasm to RARCs and other institutions for use in crop improvement research and providing the necessary information for effective utilization of such germplasm.

In Sri Lanka, with self sufficiency in rice nearly realized, the policy emphasis is now shifting towards high value crops for both domestic use and export. Although the PGRC mandate does not specifically mention this category of crops, fruits and vegetables offer the best potential for earning high farm incomes. The PGRC has commenced playing an important role in this regard through development of biotechnology. The PGRC has been equipped not only in in-vitro conservation, but also for research in biotechnology for crop improvement research. Research on the development of planting material of fruits and vegetables by tissue culture methods at the PGRC would contribute significantly towards achieving progress in horticultural exports in Sri Lanka.

Although this Project has made significant achievements in activities relating to development of plant genetic resources, the social unrest in the primary stages of the Project, delay in deployment of Sri Lankan staff and counterpart personnel and the delay in appointment of a Japanese long-term expert, have affected the implementation and progress of the project to some extent. However, activities such as survey, collection and conservation have begun to accelerate since most of the constraints have already been removed. In evaluation, distribution, exchange and utilization of genetic materials and technical transfer, the implementation has been delayed somewhat. However, in classification, conservation and data processing considerable progress has been achieved. Particularly,

techniques in in-vitro conservation and data management have been remarkably well acquired by the counterpart personnel.

The PGRC appears capable of creating a significant impact on the scientific community and institutions concerned with plant genetic resources, both locally and abroad. It has already taken several strides in this direction. Through its collaborative germplasm exploration, the PGRC has assisted international institutes in widening their germplasm base and thereby strengthening crop improvement research within these institutes. IBPGR is planning to organize the regional coordinators programme for 1992 at the PGRC in December 1992. Locally, PGRC staff members provide their services as resource personnel in genetic resource development and related biotechnological activities in other Sri Lankan institutions and universities. The PGRC has also provided facilities and guidance to university students in their research projects relating to genetic resources.

Due to the coordinated effort of both Japanese and Sri Lankan personnel, the specific achievements of this project could be listed as follows :

From 1989 to 1991, PGRC has conducted training programmes on special themes each year for researchers and extension staff in RARCs and it would be continued this year. This training was of great value to the trainees. Furthermore, from 1989 to 1991, seminars were held at the PGRC for administrators, teachers, journalists, farmers and students. This contributed to obtaining favourable publicity for the activities of the PGRC and for the role of the RARCs.

From 1989 to 1991, 14 officers have completed training in Japan and one officer at IRRI, Philippines. After returning they are utilizing skills gained in their respective units. Some have made presentations of their accomplishments to scientific societies. 5 officers are presently undergoing training in Japan. The trainees have been selected not only from the PGRC but also from RARCs. They will be able to contribute to the sustainability of this project.

In 1989, pamphlets on the PGRC were published in English and Sinhalese, and by 1991, pamphlets on RARCs were published in English. In 1992, a catalogue on genetic resources distribution will be published. These publications have helped to give wide publicity on the activities of the PGRC.

In 1990, 2 Japanese experts and their 2 counterparts have exchanged technical information with international agencies or genebanks such as ICRISAT, NBPGR in New Delhi, and the Beijing Vegetable Research Center Project with JICA cooperation in China, etc.. This has been an effective way

of bringing about international cooperation on plant genetic resources management.

Effects of equipment and facilities

Grant aid equipment and project-type technical cooperation (which amounts to 61.6 million rupees excluding grant aid), have played a key role in this project. The granting of equipment and provision of facilities has progressed smoothly. The facilities on the whole are well managed and operated. However, some equipment is not fully utilized as they need repairs. So far this has not been a major hindrance but it is important that timely action should be taken in repairing equipment. Efforts should be made to have a regular programme for maintenance of equipment, considering the difficulty in obtaining spare parts, and services of Sri Lankan engineers with knowledge on the imported equipment. The Joint Evaluation Mission is seriously concerned about the problems in maintenance of equipment, since this will affect the long-term sustainability of the Project.

The Joint Evaluation Mission has serious concerns about sustainability, in view of the aforementioned constraint.

6. Administration of the Project

The PGRC is part of the Research Division of DOA mandated to fulfil the genetic resources component of its crop improvement programmes. The agricultural research programme of the Research Division is directed towards supporting agricultural development in Sri Lanka in the short and long term with respect to crop mandate assigned to the Department.

The status of the PGRC as an institution having equal importance with RARCs of DOA was accepted at the conference on 'Role of PGRC' held in October 1988 at the Inservice Training Institute, Gannoruwa, with the attendance of 70 persons, including DA and the Head of JICA Sri Lanka office, etc.

The PGRC has played a pivotal role as a central institute in respect of plant genetic resources management in Sri Lanka. A total of 9 DOA institutes including RARCs, CRBS Batalagoda and CARI Gannoruwa are designated as regional genebanks to support the activities of the PGRC relating to collection, evaluation, conservation, multiplication and utilization of germplasm according to the M/D signed on the arrival of the Technical Guidance Team in July 1990.

The Project was designed in order to provide for effective management and operation of the plant genetic resources development programme. It has contributed towards the development of RARCs as regional genebanks. It has assisted RARCs in several instances, for example, JICA has provided some equipment (cold rooms, fences, a green house, etc.) for RARCs.

The Organizational Structure and available staff positions are shown in Fig 2. Since the beginning of the Project, its management and operation was the responsibility of the Head PGRC, assisted by two deputy heads and unit heads as shown in Fig 2. All unit head positions are presently filled, except in administration, which is currently served by an acting head (Chief Clerk). In the administration unit, present staff number is 9, including the acting head. However, there is no administration officer who must play an important role in coordinating this Project. Thus the need for an administration officer is strongly felt for smooth implementation of the Project.

Staff meetings including research meetings and administration meetings were held whenever necessary (often once or twice a month) for monitoring the progress of the Project. In addition, on July 1st 1991, the Committee for Genetic Resources Management and Operation was set up for promoting interaction between the various units. This Committee was active in the early stages of the Project, but

its activities appear to have slowed down somewhat during the latter stages of the Project. The document titled 'Procedure for management of genetic resources at PGRC' (see Annex) has laid down the general procedures for management of genetic resources at the PGRC. Attempts have been made to follow the contents of this document in day to day activities relating to genetic resources.

It was observed by the Evaluation Mission that interaction between the units of the PGRC was less than desired. This situation should be improved by means of frequent inter-unit meetings so that the Project tasks could be better accomplished.

The Joint Committee meetings as required by the R/D were held 3 times from the commencement of the Project. The Committee formulated the Annual Work Plan of the Project and reviewed the overall progress and achievements relating to the Annual Work Plan.

Although the Committee has not regularly met on a twice yearly basis as stipulated by the R/D, it has made substantial contribution towards monitoring the progress of the Project.

III CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

The project aims at strengthening activities and developing efficient methods for collection, evaluation, conservation and utilization of plant genetic resources, mainly rice and grain legumes in the PGRC and thus contributes to crop improvement in the Democratic Socialist Republic of Sri Lanka.

The Evaluation Mission has examined and viewed the project progress over the last five years of operation, and agreed to conclude as follows :

(1) Exploration and collection activities :

From 1988 to 1992, the PGRC has conducted 24 exploration missions and collected a total of 3294 accessions for conservation, evaluation and utilization. It was clear that during the initial period of the project exploration and collection activities were curtailed due to lack of trained personnel and social unrest prevalent during the period 1989-90. In spite of these difficulties, the PGRC has shown substantial progress during the 5 year period. However, it is noted that emphasis should be given to strengthen the exploration and collection activities, especially crops which are perennial in nature and seasonal in production.

Establishment of field genebanks for conservation for perennial crops is encouraged. Further, exploration and collection of crops in which not much collection has been done so far should be accelerated.

(i) Introduction from abroad :

1415 of various crop species have been introduced to the PGRC from international as well as national institutes of other countries. It is recommended that these collaborative links with the international institutes and other national institutes be maintained to receive new genetic material that they either collected or developed. Further, efforts should be made to develop collaborative links with as many countries/institutes as possible to receive more germplasm, especially for priority crops in Sri Lanka.

It is also suggested that when germplasm is introduced, requests should be made based on the country's/breeders' requirements.

It is noted that very little has been introduced in perennial horticultural crops and efforts should be focused on introducing such crops.

- (ii) Establishment of plant code and format of site records in field collections:

Details on all explorations, collections and introductions have been satisfactorily recorded. Necessary data have been collected during collection missions, and the format used for recording purposes is sufficiently prepared.

- (iii) Plans for targeted area for exploration and distribution of crop species:

Exploration missions have been conducted throughout the country during the past 5 years. Based on these experiences and available data, it is worthwhile preparing maps of distribution of various crop species in the country. It is also important to know what the crop species which are subjected to genetic erosion. This information could be utilized effectively to plan and target future exploration missions.

(2) Evaluation of plant genetic resources

- (i) Establishing descriptors

Descriptors have been prepared for 37 crops, which cover all the major field crops in Sri Lanka. Descriptors for vegetatively propagated crops, however, are yet to be prepared. Descriptors for 4 fruit crops are being prepared.

- (ii) Detailed characterization

Although the percentage of accessions characterized is not very high, i.e. 43%, the PGRC has now sufficient manpower and facilities to execute a primary role in characterizing germplasm accessions.

- (iii) Investigation of specified characters

The major part of germplasm evaluation for specified characters will be carried out at the RARCs. Strong support with scientific personnel is suggested for collaboration with RARCs.

(3) Germplasm conservation

- (i) Seed conservation

- Management of the seed bank is very satisfactory
- No decrease in viability and germinability in stored seeds after a period of 2 years, has been observed.

- Drying facilities in the genebank are not adequate for the efficient conservation of genetic material.
- Studies should be conducted to evaluate the loss of viability and germinability of different crops in storage.

(ii) In-vitro conservation

- Significant progress has been made in the long-term storage under in-vitro conditions.
- Methods developed by this unit would not only help to conserve germplasm but also have other benefits such as rapid multiplication, virus elimination and maintenance of varietal purity.
- Research should be conducted to examine the possibility of conserving germplasm in liquid nitrogen.
- CARI (root and tuber crops), RARCs and DOA farms (fruit crops) conserve some vegetatively propagated crops.
- Steps have been taken to establish field genebanks in RARCs.

(4) Multiplication

- Multiplication is carried out by the PGRC and RARCs.
- Involvement of other RARCs in the multiplication of rice germplasm is very significant.
- Most of the other crops are open pollinated and needs specific methods and trained staff. Collaborative work with other research centres will enhance this process.

(5) Data processing

- Progress made in entering passport data is satisfactory but entering characterization data is slow.
- The operating capacity of the computer system is not adequate.

(6) Distribution, exchange and utilization

- Distribution and exchange of germplasm with national and international institutes has been started.
- Cooperation given by some national institutes is inadequate.
- Lack of characterization data has reduced the number of accessions exchanged.
- It is too early to assess how the exchanged germplasm was utilized. However, those who have received germplasm

have been requested to provide the PGRC with any significant results and with publications.

(7) Other activities

- The Government of Japan has fully contributed to Sri Lankan counterpart training (including postgraduate training), seminar and provision of machinery and equipment for both the PGRC and regional genebanks.
- In particular, training of Sri Lankan counterparts is satisfactory. They are utilizing the skills gained well.
- Dispatch of Japanese experts is broadly consistent with the R/D and the TSI for the five-year period. The exception is in the field of genetic resource research (exploration, introduction and classification) due to a long delay in a replacement for Mr. Tsuruuchi.
- In the light of sustainability for genetic resource activities at PGRC and RARCs, further and continuing efforts should be made for provision of local expenses and adequate staff allocation. Moreover, it should be noted that PGRC's leadership to RARCs is extremely important for smooth genebank activities. The importance of providing adequate support for the activities relating to genetic resources should be realized by all concerned, including policy makers.
- Further close collaboration between collection, introduction, evaluation, multiplication and data processing of plant genetic resources activities is needed.
- It was observed by the Evaluation Mission that the senior officers responsible for management of the PGRC are often called upon by DOA to perform other urgent tasks relating to their discipline. While recognizing that these demands on their time cannot be totally eliminated, it is important to minimize such tasks, so that the officials could concentrate more fully on the activities of the PGRC.

(8) Future direction of PGRC

During the last 5 years the PGRC has focussed its activities on rice and other field crops with limited involvement in tissue culture relating to horticultural crops. In Sri Lanka at present there is a pronounced shift in policy emphasis from rice and other field crops towards high value crops such as horticultural crops for both domestic use and export. The PGRC has considerable resources in terms of expertise and equipment which could be utilized in the development of this sector. Considering this new trend, it would be worthwhile to examine the future role of

the PGRC to see how it can contribute towards the development of horticulture in Sri Lanka.

2. RECOMMENDATIONS

The Joint Evaluation Mission agreed to recommend that follow up technical cooperation be provided to the following areas for another 2 years after the termination of the 5-year cooperation as set forth in the R/D of the project :

- (1) Exploration, collection and introduction
- (2) Evaluation and multiplication

More attention should be given to the following activities :

- (1) Exploration, collection and introduction
 - (a) To make systematic research plans for collecting and introducing plant genetic resources to PGRC.
 - (b) To develop a map for distribution of genetic materials, targeted areas and location for collected materials, and historical records of collection and exploration activities in each crop.
 - (c) To make individual plans for collection in major crop species in collaboration with crop coordinators in DOA.
- (2) Evaluation & Multiplication
 - (a) To accelerate characterization of 41 crop species where descriptors are prepared, in close collaboration with the RARCs.
 - (b) To study detailed and specific characteristics such as resistance to pests and diseases, biotype and race analysis.
 - (c) To develop more appropriate methods of multiplication and rejuvenation in major crop species (except in rice).
 - (d) To establish harmonious flow for germplasm materials between PGRC and RARCs after multiplication with the coordination of the PGRC.
 - (e) To study the extent of genetic diversity in different crop species.

Table 1. Detailed Activities of the Project

Item	Fiscal Year	1st 1988	2nd 1989	3rd 1990	4th 1991	5th 1992/93
I. MANAGEMENT AND RESEARCH						
1. Survey, Collection and Introduction						
1.1	Collection of local germ plasms					→
1.2	Introduction of foreign germ plasm					→
1.3	Establishment of genetic resources classification computer coding	→				
1.4	Establishment of system of documentation	→				
1.5	Arrangement of passport data and entering.					→
1.6	Estimation of genetic resource distribution				→	
1.7	Mapping of genetic resource distribution					→
2. Classification						
2.1	Local germ plasm					→
2.2	Foreign germ plasm					→

Table 1. (Continued)

Item	Fiscal Year	1st 1988	2nd 1989	3rd 1990	4th 1991	5th 1992/93
3. Evaluation						
3.1	Determination of Characterisation parameters					→
3.2	Characteristics for identifying accessions					→
3.3	Resistance and tolerance to pests, diseases and other factors					→
3.4	Quality characteristics					→
3.5	Yielding potential					→
4. Conservation						
4.1	Determination of methodologies					
4.1.1	Storage					→
4.1.2	Longevity					→
4.1.3	Germination ability			→		→
4.1.4	Viability					→
4.2	Management of seeds					→
4.3	In-vivo conservation					→
4.4	In-vitro conservation					→
4.4.1	Determination of methodologies					
4.4.1.1	Rapid multiplication and acclimatization				→	
4.4.1.2	Long-term preservation					→
4.4.1.3	Somatic hybridization					→
4.4.2	Meristem culture					→
4.4.3	Anther & pollen culture					→

Table 1. (continued)

Targets for germ plasm conservation	1st 1988	2nd 1989	3rd 1990	4th 1991	5th 1992/93	Total
Conservation of seeds	4,000	2,000	2,500	3,000	3,500	15,000
In-situ conservation		200	200	100	100	600

Note: Number of accessions indicate the base collection.

Table 1. (continued)

Item	Fiscal Year	1st 1988	2nd 1989	3rd 1990	4th 1991	5th 1992/93
5. Multiplication						
5.1 Determination of methodologies						
5.1.1. Seed production						→
5.1.2. Maintenance of genetic purity						→
5.1.3. Revival and rejuvenation						→
5.2 Multiplication of germ plasm						
5.2.1 Collection and introduction						→
5.2.2 Stored genetic resources						→
6. Data processing						
6.1 Determination of methodologies						
6.1.1 Data Management system		→				
6.1.2 Data recording						→
6.1.3 Data processing of construction of data base						→
6.1.4 Data cataloguing						→
7. Distribution, exchange and utilization						
7.1.1 Distribution (local)						→
7.1.2 Exchange (international)						→
7.1.3 Utilization (hybridization)						→

Table 2 Long-Term Experts

Expert	Assignment	Role	Period
Dr. S. Watanabe	Team Leader	Project management	06 Sept 88 - 31 Mar 93
Mr. I. Tojo	Coordinator	Project coordination	16 Jan 91 - 31 Mar 93
Mr. S. Amma	Expert on Genetic Resource Management	Conservation and Data management	07 Feb 89 - 31 Mar 93
Mr. K. Ouchi	Expert on Agronomy	Multiplication and Evaluation	16 Sep 91 - 31 Mar 93
Mr. J. Takahashi	Coordinator/Agronomy	Project coordination	09 Aug 88 - 14 Jan 91
Mr. T. Tsuruuchi	Genetic Resource Research	Multiplication and Evaluation Exploration, Introduction & Classification	15 Jan 91 - 08 Aug 91 06 Sep 88 - 05 Sep 91

Table 3

Short-Term Experts				
Fiscal Year	Expert	Institute	Field	Period
1988	Mr. M. Umehara	NIAR	Data management	14 Mar 89 - 3 Apr 89
	Dr. Y. Egawa	NIAR	Identification of genetic resources	14 Mar 89 - 10 Apr 89
1989	Dr. Y. Asano	NIAR	In-vitro conservation	26 Jun 89 - 27 Jul 89
	Mr. M. Umehara	NIAR	Data management	24 Aug 89 - 16 Sep 89
	Mr. S. Sato	NIAR	Seed Physiology	24 Aug 89 - 23 Sep 89
1990	Ms M. Shojima	-	Data management	29 Nov 90 - 12 Jun 91
	Dr. H. Kajiwara	NIAR	Amino acid analysis	02 Mar 91 - 29 Mar 91
	Dr. M. Ishige	NIAR	In-vitro conservation	21 Mar 91 - 12 Apr 91
1991	Prof. S. Sakamoto	Kyoto Univ	Exploration of genetic resources	01 Aug 91 - 01 Sep 91
	Prof. S. Nakamura	Tokyo Agri. Univ.	Seed Physiology	26 Aug 91 - 23 Sep 91

Note: NIAR - National Institute of Agrobiological Resources

Table - 4.

Items supplied to RARC's and A.R.S.'s of DOA under the PCRC - JICA Project

	Bombu- wela	A'pelessa	Maha Illuppiama	Makan- dura	Canno- ruwa	B'goda	Gi'kotte	B'wela	A'tota	A'wila	Seetha Eliya	National Herbarium
1. Coldroom units	1	-	-	1	-	1	-	-	-	-	-	-
2. Greenhouse	1	-	-	-	-	-	-	-	-	-	-	-
3. Two-wheel tractor with attachments	1	-	-	-	-	-	-	-	-	-	-	-
4. Rice planter with attachments	1	-	-	-	-	-	-	-	-	-	-	-
5. Photocopier	-	-	1	-	1	-	1	-	1	-	-	-
6. Sprayers	2	1	1	2	1	2	-	1	-	1	-	-
7. Field balance	1	1	1	1	1	1	-	1	1	1	-	-
8. Slide projector	-	-	-	-	-	-	-	-	-	-	-	1
9. Overhead projector	-	-	-	-	-	-	-	-	-	-	-	1
10. Meteorological unit	1	-	-	-	-	-	-	-	-	-	-	-
11. Cooling cabinet	-	1	-	-	-	-	-	-	1	-	1	-
12. Pegs, tables trays, cloth bags paper bags	S	S	S	S	S	S	S	S	S	S	-	-
13. Stationery	S	S	S	S	S	S	S	S	S	S	-	S
14. Glassware	-	-	-	S	-	S	-	-	-	-	-	-
15. Seed container	S	S	S	S	S	S	S	S	S	S	-	-

S - Supplied
A' pelessa - RARC/ Angunakolapelessa.
B'wela - RARC/ Bendaravela
B'goda - CRSC/ Batalagoda
A'wila - RARC/ Aralaganwila
A'tota - ARS/ Ambalanthota
Gi'kotte - ARS/ Girandurukotte

Table 5. Training

Fiscal Year	Officer	Field	Institute	Period
1988	S. Balendira (R.A.)	Genetic resources management & databasing	NIAR	27.03.89 - 15.10.89
1989	C.B. Hindagala (R.O.)	Study tour	Agric. res. institutes	14.08.89 - 10.19.89
	K.P.D. Sriwardena (R.O.)	Germplasm evaluation	NIAR	14.08.89 - 11.02.90
	D.P. Rajapakse (R.O.)	In-vitro conservation & tissue culture	NIAR	12.03.90 - 08.09.90
	H.M.S. Wijayaratne (E.O.)	Introduction, multiplication & evaluation (rice)	NARC	21.03.90 - 20.07.90
1990	R.R.U.N. Ratnayake (A.F.)	Field management in genetic resources	NARC	01.07.90 - 28.10.90
	S.C.J. Dissanayake (E.O.)	Data management	NIAR	05.12.90 - 02.06.91
	P.V. Hemachandra (E.O.)	Group training	NIAR	13.05.90 - 11.08.90
	A. Hettiarachchi (R.A.)	Plant genetic resources 3rd country training In-vitro conservation	IRRI	28.10.90 - 27.04.91
1991	H.J. Warshakoon (R.A.)	Identification techniques in genetic resources	NIAR	13.0591 - 10.10.91
	S.P. Dharmawardena * (A.O.)	Field management techniques in genetic resources	NARC	18.07.91 - 14.12.91
	U. Siriyadasa (R.A.)	Data management	NIAR	01.10.91 - 30.09.92
	L.A. Weerasena * (R.O.)	Improvement of oil seed crops	NIAR, Chiba Agr. Exp. Stn. Kochi Uni.	10.03.92 - 06.10.92
	D.M. Thilakarathne	Management of Conserv. equipmt & evaluation of genetic resources	Kyoto Univ. NIAR	31.03.92 - 29.09.92
	A.M. Perera (R.O.) *	Group training in plant genetic resources	VTES NIAR	03.92 - 09.92

Table 5 (continued)

Fiscal Year	Officer	Field (PhD MSc)	University	Period
1992	L.P.Somadasa (R.O.) *	Breeding and conservn. of fruit trees	FES TARC Okinawa	31.08.92 - 03.03.93
	H.L.Dayananda (E.O.) *	Evaluation & conservn. of vegetables	VTES	31.08.92 - 03.03.93
	N.Easwarapadcham (E.O.) *	Tissue culture of vegetables	VTES SSMC	13.09.92 - 10.03.93
		Study (PhD.MSc)		
		Field (PhD MSc)		
1991	P.K.Samarajeewa (R.O.)	Molecular Biology (PhD)	Tokyo Univ. (Prof.Uchimiya)	01.10.91 -
1992	S.D.Bandara (R.O.) *	Plant exploration & classification (MSc)	Kyoto Univ. (Prof.Sakamoto)	13.10.92 -
1993	Y.Ketepearachchi (R.O.) *	Screening for insect resistance	Kobe Univ. (Prof.Kaneda)	Identified for PhD training

NIAR - National Institute of Agrobiological Resources, Japan
 NARC - National Agriculture Research Centre, Japan
 IRRI - International Rice Research Institute, Philippines
 VTES - Vegetable and Tea Experiment Station, Japan
 TARC - Tropical Agricultural Research Centre, Japan
 SSMC - Seed & Seedling Management Centre, Japan

R.O. - Research Officer
 A.O. - Agricultural Officer
 E.O. - Experimental Officer
 R.A. - Research Assistant
 A.F. - Agriculture Foreman

* Officers from RARCs (all others are PGRC officers)

Table - 6. Plant Genetic Resources Training Programme

Year	Training Conducted for	Participation Number
1989	Research Officers - DOA	20
1990	Research Officers - DOA	18
1990	Middle Level Technical Officers - DOA	21
1991	Research Officers - DOA	16
1991	Middle Level Technical Officers - DOA	33

		108
		=====
1991	Assistant Directors of Agriculture & Subject Matter Specialists - DOA	20
1991	Lecturers School of Agriculture, Kundasale - DOA	14

		34
		=====
1989	Administrators - DOA	22
1991	Assistant Divisional Secretaries/ AGA - Provincial Council, Central Province	31

		53
		=====

Table 6. (Continued)

Year	Training Conducted for	Participation Number
1989	Agriculture /Bio-Science Teachers Education Department	37
1990	- do -	11
1991	- do -	73
		<u>121</u>
1989	Other Non - Governmental Organizations	04
1990	- do -	23
1991	- do -	80
		<u>107</u>
1990	Advanced Level Science Students	142
1991	Undergraduate Science Students of the University	13
		<u>155</u>
	Grand Total	578

Table 7.

Plant Genetic Resources Conservation
Awareness Programme

	Number of Organizations visiting PGRC	Number of Participants	Number of Officers/ Teachers
Schools	98	5478	517
Agricultural and Other/Organizations	61	2272	140
Total	159	7750	657

Table 8.

Budget Supported by JICA

	1986	1988	1989	1990	1991	1992	total
Miscellaneous (Rs.m) (Salaries of consultant, secretaries, labour hired by the project, Fuel, Fertilizer, Stationery, Germplasm collection, official travel and daily requirements etc.)		0.8	1.4	1.5	1.5	1.6	6.8
Equipment (Rs.m) (Equipment mainly imported from Japan and other countries.)		10.4	11.2	9.4	5.1	8.3	44.4
Local budget (Rs.m) (Urgent repairs and constructions at PGRC & RARC's Training and Seminars Printing & preparing of reports Technical exchange trips to other countries etc.)			2.2	3.5	2.3	2.4	10.4
		11.2	14.8	14.4	8.9	12.3	61.6

Note: 1992 are estimated figures

Table 9.

Staff Assignment Plan for the Proposed Centre in R/D

Laboratory	Categories of Staff	CARI Botany Div.	Annual Plan					Total
			1987	1988	1989	1990	1991	
Exploration & Collection Laboratory	R.O.	6	2	-	-	1	-	9
	R.A.	3	2	2	-	1	-	8
Seed Storage Laboratory	R.O.	3	1	1	2	1	1	9
	R.A.	1	2	1	1	1	-	6
Evaluation Laboratory	R.O.	10	-	6	-	1	2	19
	R.A.	3	-	6	-	1	2	12
Vegetatively Propagated Crops Laboratory	R.O.	4	-	2	-	-	1	7
	R.A.	2	-	2	-	-	1	5
Data Management Laboratory	R.O.	1	-	2	-	-	1	4
	R.A.	1	-	3	-	-	1	5
Sectional Total	R.O.	24	3	11	2	3	5	48
	R.A.	10	4	14	1	3	4	36
Field Management Services	F.M.	-	-	1	-	-	-	1
	A.F.M	-	-	1	-	-	-	1
	Supervisors	-	-	1	-	-	-	1
Administration	A.D.O.	-	-	1	-	-	-	1
	Clerical	-	-	3	-	-	-	3
	Typist	-	-	2	-	-	-	2
	Maintenance Technician	-	-	2	-	-	-	2
Total		34	7	36	3	6	9	95

R.O. : Research Officers
R.A. : Research Assistants.

Table 10.

Staff of the PGRC

Unit	Categories of Staff	Present Status	Present requirement
Head/PGRC	Head	1	1
Germplasm Exploration Collection, Introduction	R.O.	3	3
	A.I.	1	1
	R.A.	2	3
	K.V.S.	1	1
Germplasm Conservation (Seed Storage- Gene Bank)	R.O.	-	2
	E.O.	1	1
	R.A.	2	3
	K.V.S.	-	-
Germplasm Evaluation and multiplication	L.S.A.	3	5
	R.O.	3	4
	A.O.	1	1
	A.I.	1	1
	R.A.	3	3
<u>In Vitro</u> Conservation and biotechnology	K.V.S.	4	4
	R.O.	3	3
	R.A.	2	4
Data Management	K.V.S.	1	1
	R.O.	1	1
Sectional Total	R.A.	1	1
	Head	1	1
	R.O.	10	13
	A.O.	1	1
	E.O.	1	1
	A.I.	2	2
	R.A.	10	14
	K.V.S.	6	6
L.S.A.	3	5	

Table 10. (continued)

Unit	Categories of Staff	Present Status	Present requirement
Field Management Service	Farm Manager	1	1
	Agric. Foreman	1	1
	K.V.S.	1	1
Administration	Administrative Officer	-	1
	Librarian	-	1
	Chief Clerk	1	1
	Clerks	3	3
	Store Keeper	2	2
	Typists	2	2
Maintenance technicians	R.A.	2	2
	K.V.S.	1	1
	Cinema Operator	1	1
Total		49	60

R.O. - Research Officer
 A.O. - Agriculture Officer
 E.O. - Experimental Officer
 A.D.O. - Administrative Officer
 A.I. - Agriculture Instructor
 R.A. - Research Assistant
 K.V.S. - Krushikarma Viyaptha Sevaka
 L.S.A. - Lab Sub Assistant

Table 11.

GOSL Recurrent Expenditure -- PGRC

	1989	1990	1991	1992 *
	Rs.Cts.	Rs.Cts.	Rs.Cts.	Rs.Cts.
01. Officers' Salaries	15,21,556.00	19,60,956.00	20,38,282.00	17,02,054.00
02. Salaries of minor employees	7,74,655.00	10,30,568.00	11,29,245.00	15,34,450.00
03. Local travel	21,165.00	63,299.00	35,175.00	72,380.07
04. Fuel	88,145.00	1,01,942.00	91,735.00	70,946.50
05. Electricity	4,01,725.00	6,08,959.00	9,06,347.00	9,66,418.00
06. <u>Other expenditure</u>				
Other services)				
Store items)				
Stationery)				
Uniforms)	46,919.00	1,71,355.00	77,045.00	1,06,082.00
Telecommunication)				
Repair of equipment)				
and vehicles)				
Total	2,854,165.00	3,937,079.00	4,277,829.00	4,452,330.50

* up to October 1992.

Table 12.

GOSL Capital Expenditure - PGRC

	1989	1990	1991	1992 *
	Rs.Cts.	Rs.Cts.	Rs.Cts.	Rs.Cts.
01. Timber and furniture	2,91,476.36			
02. Cutlery, crockery etc. for Circuit bungalow		81,767.38		cutlery
03. Water pump,) Lawn mover,) Repair of road,) Official residence,) Freight charges,) Other,)			5,17,408.00	
04. Electricity supply				8,500.00
Total	2,91,476.36	81,767.38	5,17,408.00	8,500.00

* up to October 1992.

Table 13 Sharing of Indigenous Germplasm with International Institutes

Year of Exploration	Institute	Crops collected during collaborative exploration missions	No. of Accessions given as share
1972-1988	IRRI (Philippines)	Rice including wild species	2420 *
1991	NPBGR (India)	Okra, Brinjal & their wild relatives	118
1991	ICRISAT (India)	Pigeon pea & their wild relatives	37
1992	MAFF (Japan)	Millets	90

* All rice accessions are duplicated at Fort Collins, Colorado.

Table 14

Germplasm Collections from 1986 to 1992

Year	Exploration & Collection	Collected from RARC's	Introductions	Local rice germplasm returned from IRRI	Total
1986-1988	1394	-	145	-	1539*
1988	140	-	195	-	335
1989	200	829	258	1862	3149
1990	331	955	96	-	1382
1991	922	382	648	-	1952
1992 (up to Oct.)	307	369	73	-	749
	3294	2535	1415**	1862	9106

* Germplasm collected from 1986 to 1988 (before the project period)

** Germplasm introduced from following institutions/countries.

Institutions - AVRDC, CIMMYT, CIP, ICARDA, ICRISAT, IITA, SAPPAD

FAO - Seed Exchange and Information Centre

Countries - Thailand, Japan, USA, China, Argentina, Vietnam

Table 15

Independent Explorations Made by PGRC
from 1988 to 1992 (Upto October)

Year	No. of explorations conducted	No. of accessions collected
1988	3	140
1989	3	200
1990	5	331
1991	8	767
1992	5	217
Total	24	1655

Table 16 Multiplication and characterization/evaluation of germplasm
during the period 1986-1992

Year	Multiplication				Characterization/Evaluation				
	Rice	No. of other Crops	No. of Accessions	Total	Rice	No. of other Crops	No. of Accessions	Total	
1986-1987	-	-	-	555	-	-	-	205	
1988		12	647	647	-	8	318	318	
1989	158	30	487	645	-	5	175	175	
1990	515	29	660	1175	296	11	247	543	
1991	1104	29	611	1715	1104	14	446	1550	
1992	962	19	504	1466	812	8	296	1108	
Total	2739		2909	6203	2212*		1482	3699	

* 1752 accessions were characterized at CRBS/Batalagoda,
 RARC/Bombuwela, RARC/Maha Illuppallama and
 ARS/Ambalantota

Table 17
Number of Accessions Conserved during the Period 1989-1992

Year	Rice	Other Crops	Total
1989	15	475	490
1990	83	503	586
1991	151	1686	1837
1992	1870	658	2528
Total	2119	3322	5441

* Upto November

Table 18

Present Status of In Vitro Conservation of Germplasm of
Vegetatively Propagated Crops

Crop	No. of Accessions
Cassava	65
Sweet potato	66
Potato	125
Banana	05
Innala	01
Dioscorea	05
Colocasia	04
Xanthosoma	02
Total	273

Table 19. Example of PGRC List of Accessions

<u>Acc. No.</u>	<u>Stock No.</u>	<u>Species</u>
000001	06016	<u>Cucumis melo</u> L.
000002	06014	<u>Coccinia cordifolia</u> Cogn.
000003	06016	<u>Cucumis melo</u> L.
000004	02002	<u>Sorghum bicolor</u> (L.) Moench
000005	06016	<u>Cucumis melo</u> L.
000006	02001	<u>Zea mays</u> L.
000007	03001	<u>Vigna unguiculata</u> (L.) Walp.
000008	03001	<u>Vigna unguiculata</u> (L.) Walp.
000009	03001	<u>Vigna unguiculata</u> (L.) Walp.
000010	05005	<u>Capsicum annuum</u> L.
000011	05003	<u>Solanum melongena</u> L.
000012	06001	<u>Cucurbita moschata</u> (Duchesne) Poir.
000013	05003	<u>Solanum melongena</u> L.
000014	10006	<u>Amaranthus hybridus</u> L.
000015	05002	<u>Solanum melongena</u> L.
000016	09001	<u>Abelmoschus esculentus</u> (L.) Moench
000017	02003	<u>Eleusine coracana</u> (L.) Gaertn.
000018	02004	<u>Setaria italica</u> (L.) Beauv.
000019	04002	<u>Vigna unguiculata</u> (L.) Walp.
000020	06016	<u>Cucumis melo</u> L.
000021	03002	<u>Vigna radiata</u> (L.) Wilczek
000022	02001	<u>Zea mays</u> L.
000023	02003	<u>Eleusine coracana</u> (L.) Gaertn.
000024	03001	<u>Vigna unguiculata</u> (L.) Walp.
000025	03001	<u>Vigna unguiculata</u> (L.) Walp.

Table 20

Passport Data for Rice and Other Crops in the Database

Year	Rice	Other Crops*	Total
Upto 1988	—	—	2676
1989	0	1963	1963
1990	102	620	722
1991	2259	795	3054
1992	404	287	691
Total	2765	3665	9106

* Total of 129 crop species

Table 21

Distribution of Germplasm

Year	Local	International	Total
1989	165	-	165
1990	161	21	182
1991	117	05	122
1992*	110	06	116
Total	553	32	585

* Up to November 1992

Fig. 1 Organization of MADR

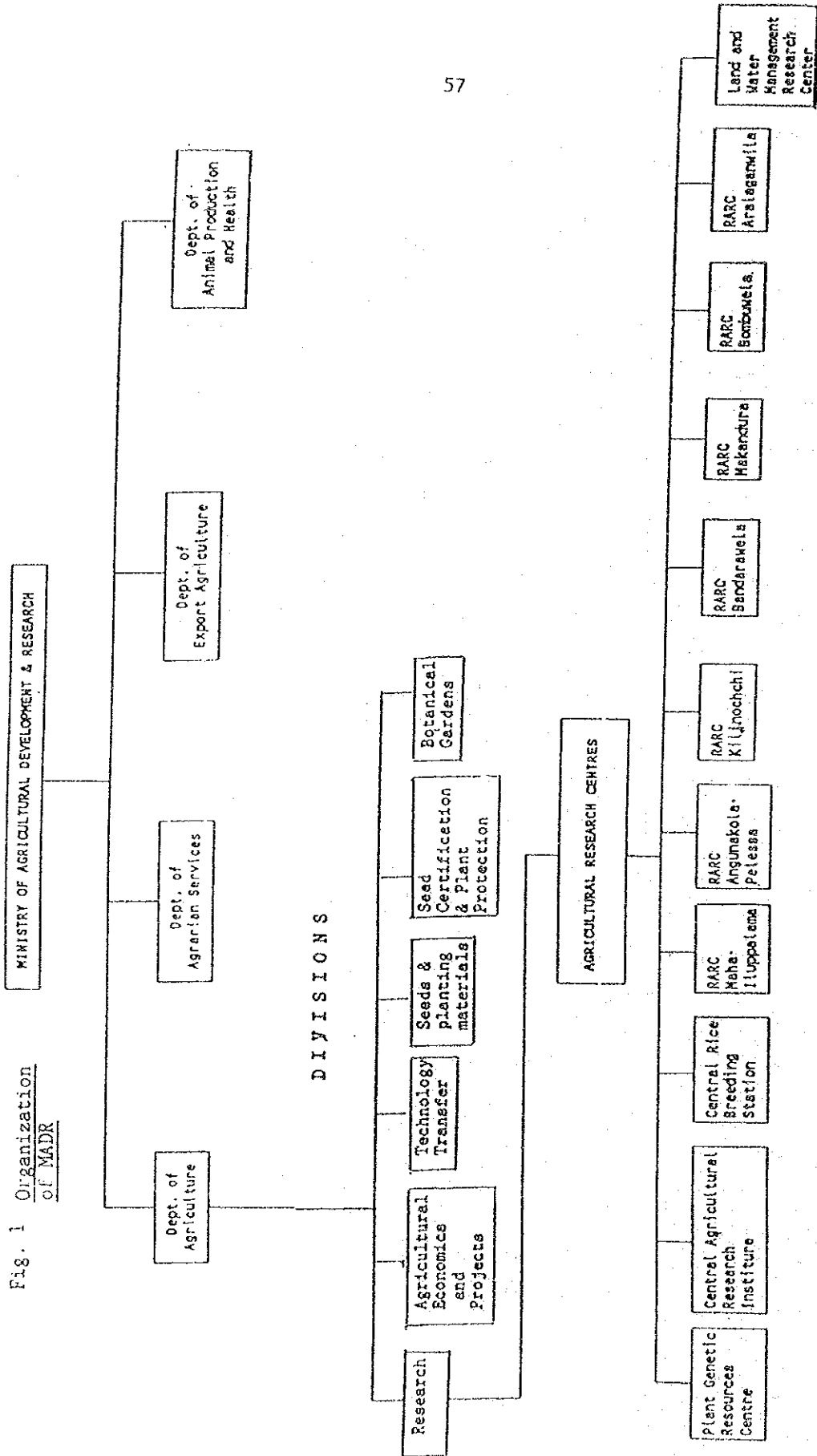


Fig. 2. Organizational Structure of the PCRC

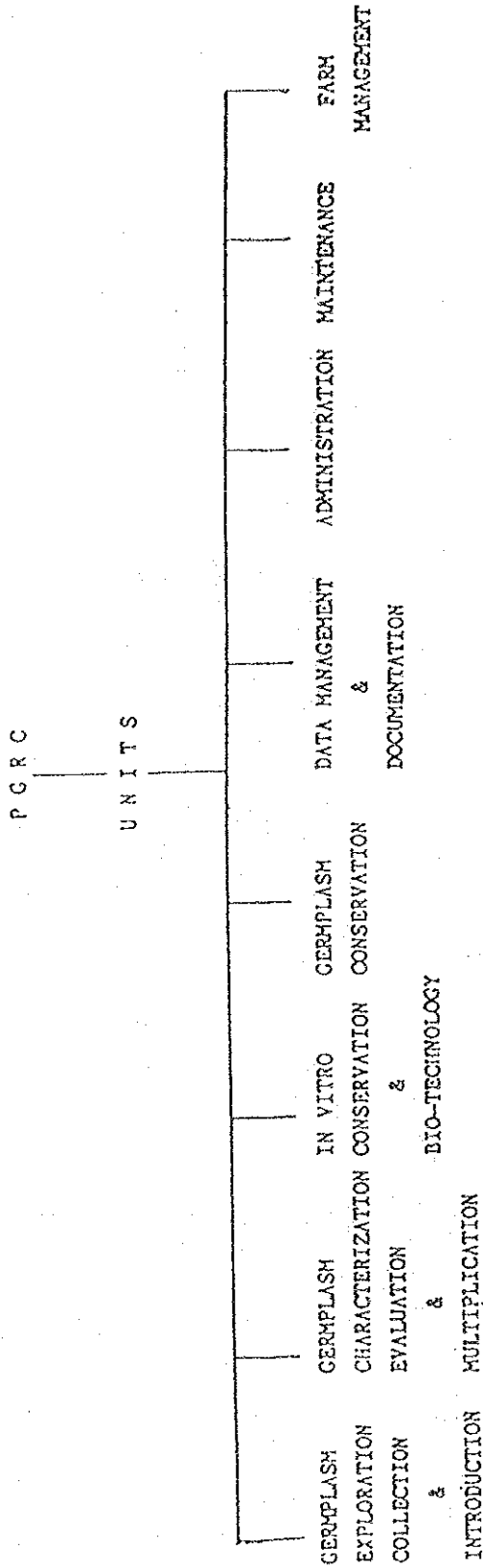
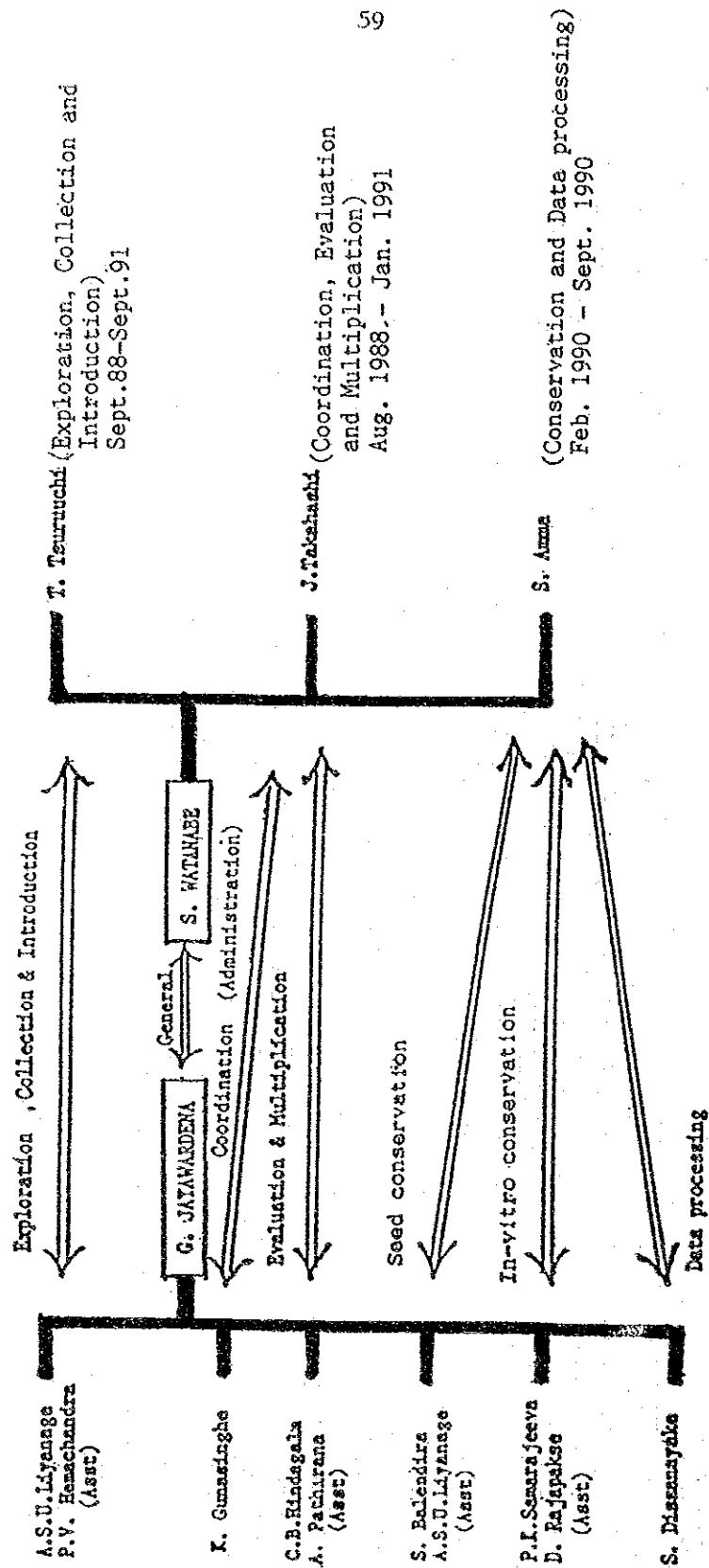


Fig. 3.a.

Technical and Administrative Work Flow Chart of PGRC Project, 1st April 1990



1. Note: Organization, Relationship between experts & counterparts, Assistance
1. Note to counterparts: All matters related to finances, equipment, training, technical reports, go through Head, PGRC.

Technical and Administrative Work Flow Chart of PGRC Project, 1st April 1991

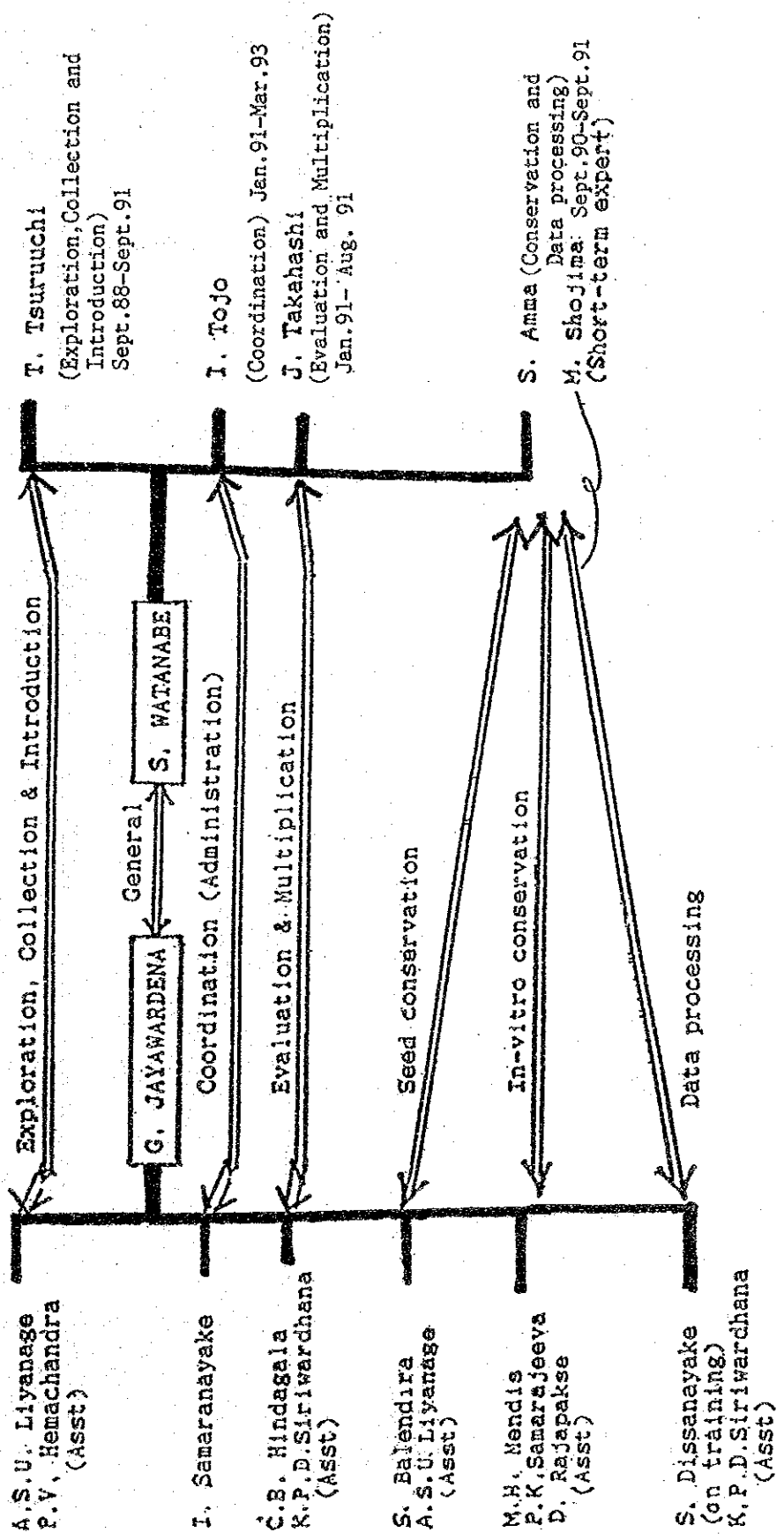
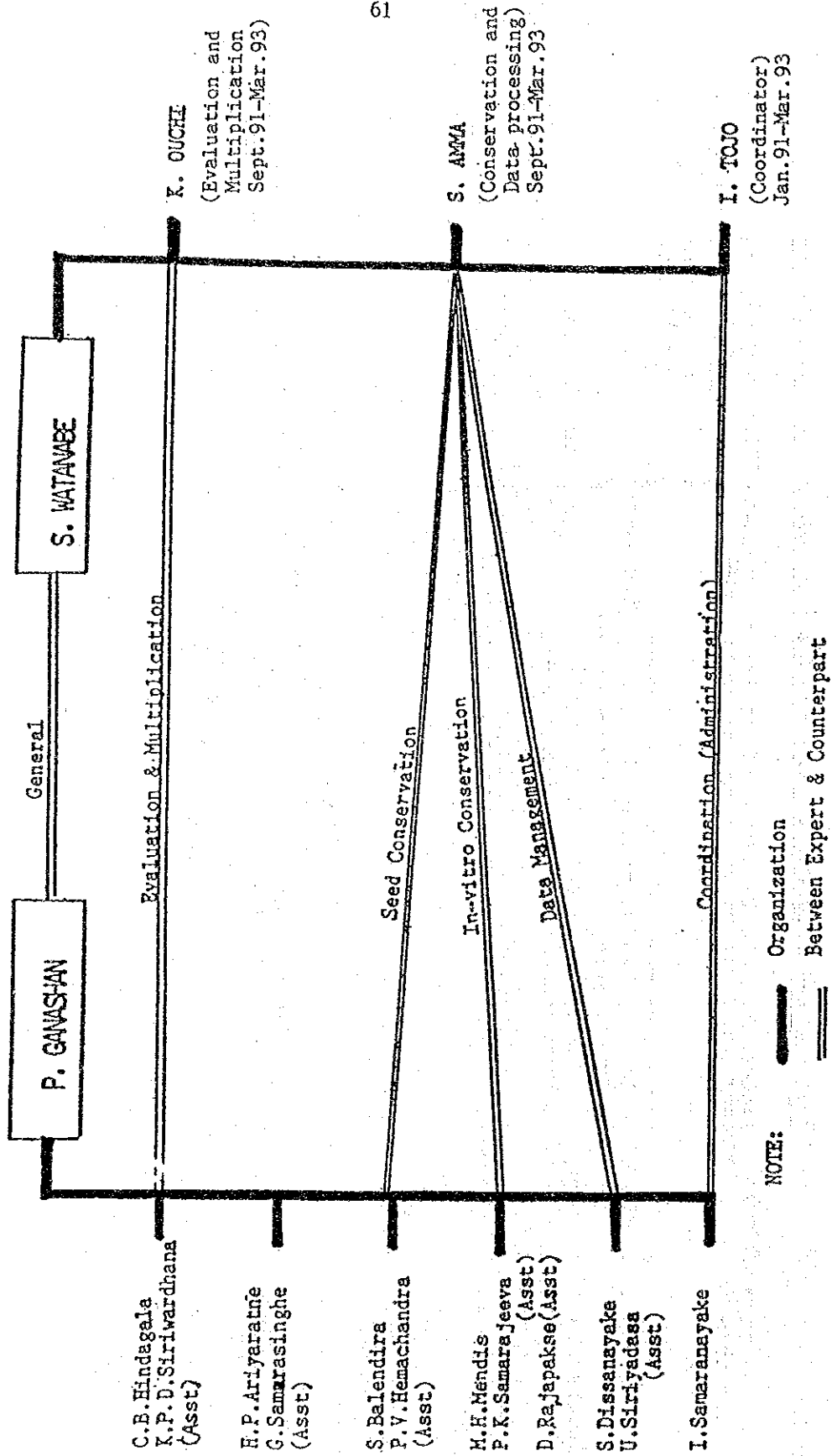


Fig. 3.b.

Note: Organization Relationship between experts & counterparts
 Note to counterparts: All matters related to finance, equipment, training, technical reports, go through Head, PGRC.

Fig. 3.C.

Technical and Administrative Work Flow Chart of PGRG Project, 10th March 1992



Annex: Procedure for Management of Genetic Resources
at the PGRC

EXPLORATION UNIT

1. Receipt of material

- 1.1 Receive material, check, register with collection number.
- 1.2 Fill seed-list form.
- 1.3 Check quantity. If sample needs immediate multiplication, forward to Evaluation unit and request multiplication and return of multiplied seed.
- 1.4 Forward seed with seed-list to the conservation laboratory.

CONSERVATION UNIT

2. Preliminary checking

- 2.1 Duplication - check whether material is already in the gene bank. If duplication is beyond doubt reject.
 - 2.2 Check condition of seeds.
 - 2.3 Check seed viability
3. Decide whether sample should be accepted. If rejected, note reasons in seed-list.
4. Accession number
- 4.1 If it is decided that sample is to be preserved, give it an accession number.
 - 4.2 Enter accession number in seed list and return to Exploration unit.

EXPLORATION UNIT

5. Fill a passport data form.

- 5.1 Forward data to the Data Processing Unit.

DATA PROCESSING UNIT

- 6. Forward new accession data to Evaluation unit.

CONSERVATION UNIT

7. Seed cleaning
8. Determining seed moisture content
9. Seed drying.
10. Seed packaging

Select packing material to suit storage conditions:

for active collection - aluminium foil bags
for base collection - tin cans.

The aluminium foil bags are evacuated and sealed, and tin cans are hermetically sealed.

11. Seed storage

Active collection at 5°C
Base " " 1°C

Forward storage data to Data Processing unit

EVALUATION UNIT

12. Multiplication and characterization

Decisions regarding multiplication are taken by 4 persons representing the Exploration unit, the Conservation unit the Evaluation unit and Evaluation (Rice), who will meet for this purpose in the third week of February and third week of August every year. They will:

- 12.1 Determine how many accessions can be multiplied in the next season.
- 12.2 Decide which accessions to multiply in the next season, out of :
accessions in storage with low stocks of seeds and all accessions with low seed viability;
Arrange these accessions in order of priority.
- 12.3 Determine where multiplication is to be carried out.
- 12.4 The Conservation unit will supply seed labelled with the accession number for multiplication and characterization at least 2 weeks before the planting season begins, for Yala in the 3rd week of March and for Maha in the 3rd week of September
- 12.5 The Evaluation unit will forward harvested and processed seeds to the Conservation unit.

12.6 If the name of an accession was revised, inform Exploration unit.

12.7 Forward characterization data to Data Processing unit.

EXPLORATION UNIT

13. Assign correct plant code to accessions whose names are revised, and inform Conservation, Data Management and Evaluation units.

CONSERVATION UNIT

14. Distribution of germplasm

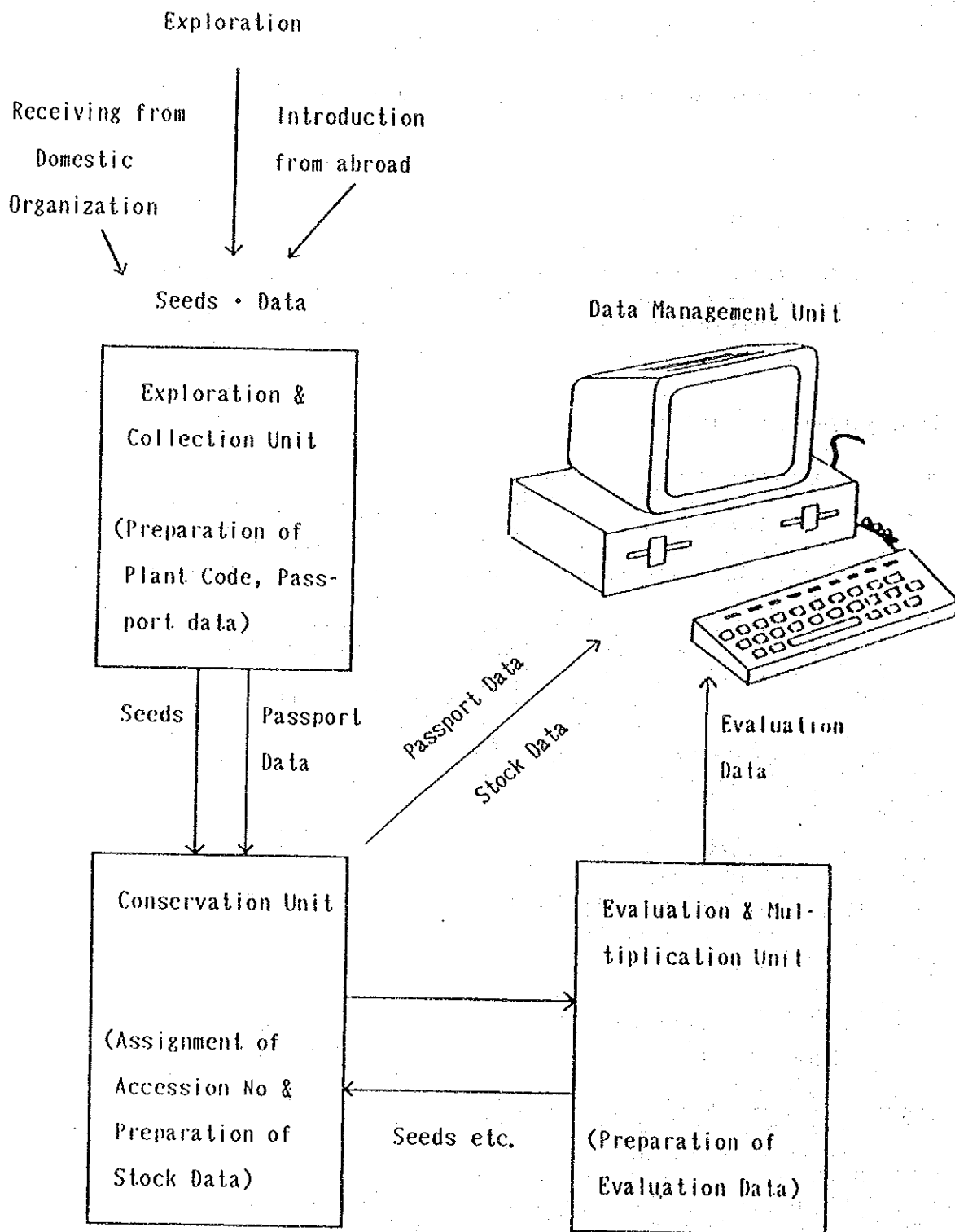
14.1 Germplasm is distributed in response to requests from users for breeding and research. Seeds are distributed only from active collections.

14.2 Decisions regarding compliance with requests for germplasm are made by the Head, PGRC.

15. Monitoring accessions for viability and quantity at regular intervals according to the crop during storage.

EVALUATION UNIT.

16 Regeneration of base and active collections.



Flow of germplasm and data at PGRC

(参考2) 分野別実績一覧表 (日本人専門家チーム作成)

達成度 5:100%
4:75%
3:50%
2:25%
1:0%

延長の必要性 ○:必要
△:縮小して対応
×:不要

(1) 総括表

	課 題	達 成 度					延長の必要性
		5	4	3	2	1	
探索・ 収集・ 導入	1.1 国内遺伝資源の収集				◎		○
	1.2 外国からの導入			◎			△
	1.3 植物分類コードの確立		◎				×
	1.4 記録方法の確立			◎			△
	1.5 ハース・データの整理及び入力			◎			△
	1.6 遺伝資源分布地域の推定				◎		○
	1.7 遺伝資源分布地図の策定				◎		○
導入 分類	2.1 国内遺伝資源		◎				×
	2.2 海外導入遺伝資源			◎			×
評価	3.1 特性調査基準確定				◎		○
	3.2 品種判別特性の調査				◎		○
	3.3 病害虫等抵抗性の検定					◎	○
	3.4 品質特性の検定					◎	△
	3.5 収量性の検定				◎		×
保存	4.1.1 保存条件		◎				×
	4.1.2 寿命		◎				×
	4.1.3 発芽試験方法		◎				△
	4.1.4 活力		◎				×
	4.2 種子の保存			◎			△
	4.3 栄養体の保存 (圃場以外)			◎			△
	4.4 In-Vitro保存						
	4.4.1.1 大量増殖及び履化		◎				×
	4.4.1.2 長期保存法					◎	×
	4.4.1.3 細胞育種技術					◎	×
4.4.2 茎頂培養系			◎			×	
4.4.3 やく及び花粉培養系	◎					×	
増殖	5.1.1 種子生産			◎			○
	5.1.2 増殖時の遺伝性保持の検討				◎		○
	5.1.3 活性低下遺伝資源の増殖法					◎	○
	5.2.1 収集・導入遺伝資源の増殖				◎		○
	5.2.2 保存遺伝資源の増殖				◎		○
情報 管理	6.1.1 情報管理システム		◎				×
	6.1.2 データ入力			◎			△
	6.1.3 データベースの構築		◎				×
	6.1.4 保存目録の作成				◎		○
配 布 利 用 交 換	7.1 配布 (国内)				◎		△
	7.2 交換 (外国)				◎		△
	7.3 利用 (育種素材)				◎		×
自 運 主 管 管 理	8.1 自主管理運営					◎	○

(2) 分野別実績表

協力課題	目標	達成度	現状及びこれまでの成果	残された課題	必要性	延長の必要性及び延長による効果の取集の計画性と記録の的確さが育つ。
1.1 採集・導入 1.1.1 国内遺伝資源の取集	国内各地に分布する植物遺伝資源を野生種、在来種を主体に採集、記録する。	2	1992年8月末現在の累計取集点数は3,492点に達した。	野菜類特に777種、科、科、根菜類の取集、計画的な取集と記録法の研修。	○	
1.2 外国からの導入	国内で採集できなから必要遺伝資源を外国から導入する。	3	1992年8月末現在の累計導入点数は1390点に達した。発芽力の失われたものが多い。	山、玉ねぎ、熱帯及び温帯野菜の導入が必要。	△	必要導入遺伝資源の記録が進む。
1.3 植物分類コードの確立	取集遺伝資源を分類するため、植物分類コードを定める。	4	植物分類コード(170種以上)作成を指導し、ほぼ完成させた。	記録項目がまだ充分同定されていない。	×	
1.4 記録方法の確立	採集及び取集後に必要な記録項目及び記入方法を定める。	3	目標に沿って、取集現場での記録方法及びフィールドの記入様式を指導した。	記録項目がまだ充分同定されていない。	△	記録方法を定め、記録項目数を増やす。
1.5 ハーブ・ドライの整理、及び入力	遺伝資源の採集を示す Herb-dry を整理、入力し活用する。	3	Herb-dry の整理、入力方法が修得された。1992年8月現在の入力点数は6537点に達した。	Herb-dry の迅速な整理。入力的重要性の認識徹底。記入及び入力力の向上の徹底。	△	迅速に Herb-dry が整理され、コンピュータに導入できる。
1.6 遺伝資源分布地域の推定	国内での採集・取集計画の立案に必要な、遺伝資源分布地域の推定を行う。	2	中部・南部ならびに西部を主体に、全国のほぼ30%の地域の遺伝資源分布を推定した。	国の北部・東部の遺伝資源分布法の推定。	○	推定に信頼性が増す。
1.7 遺伝資源分布地図の策定	1.6に基づき、植物別の遺伝資源分布地図を作成する。	2	件、とうもろこし、雑穀、豆類、とうがらし、わかなど分布地図を作成した。	野菜、油料作物、7ループの分布図の作成。	○	分布図の作成がより的確になる。

協力課題	目標	達成度	現状及びこれまでの成果	残された課題	必要性	延長の必要性及び 延長による効果	
2 分類 2.1 国内遺伝資源	国内で収集した遺伝資源の 植物分類を行う。	4	植物分類コードに基づき分類法 が把握され、その手法がほぼ 定着した。	PERCで定めた植物コードで 分類できないものの 処置。	×		
2.2 海外導入遺伝資源	海外から導入した遺伝資源 の植物分類を行う。	3	同上	同上	×		
3 評価 3.1 特性調査基準確定	評価を統一的に行うため 植物別の調査項目と調査 基準(データベース)を定める。	2	36植物のデータベースを 作成中。 主要作物は含まれている。	残された植物のデータベース の作成。	○		データベース作成植物数 が増える。
3.2 品種別特性の調査	保存遺伝資源の Characterization調査。	2	累計調査点数は2028点に 達した。ジョブへの入力点数 はその40%程度である。	調査方法の確立。	○		調査方法が技術移転 された。植物数が 増える。
3.3 病害虫等抵抗性の検定	主要植物の重要病害虫 抵抗性検定方法の確立と データベースの収集。	1	自然条件下の検定結果が 得られた。(コアバンク)	菌のレウス、虫のバイオタイプを 考慮した検定法と、データベース の収集。	○		正しい抵抗性検定法が 認識される。
3.4 品質特性の検定	品質を評価する検定方法の 確立とデータベースの収集。	1	評価はあまり進んでいない。	評価方法の標準化と データベースの収集。	△		評価方法が改善 される。
3.5 収量性の検定	収量性検定方法の確立と データベースの収集。	2	植物別に検定が進んだ。 (コアバンク)	評価方法の標準化、 限られた検定点数 ならびにデータベースの収集 現場条件の改善。	×		(自ら改善可能)

協力課題	目標	達成度	現状及びこれまでの成果	残された課題	必要性	延長の必要性及び延長による効果
4.1 保存方法の確立 4.1.1 保存条件	植物種子の最適保存条件を明らかにする。 特に難貯蔵性種子を調べる。	4	難貯蔵性種子のピクゴ-ホドと最適貯蔵温度を明らかにする。試験方法が修得された。	他の難貯蔵性種子(ピクゴ-ホド、ペリ-ワット、アワ)の最適貯蔵温度の推定。	×	
4.1.2 寿命	PGRC種子貯蔵庫の保存条件下における主要植物の寿命を調べる。	4	貯蔵温度と種子水分それぞれが寿命に与える影響を調べる。その技術が修得された。	雑穀、野菜、とうがらしなどの寿命推定。	×	
4.1.3 発芽試験方法	保存遺伝資源種子の発芽試験方法を明らかにする。	4	大粒り巻紙法、小粒り巻紙法、吸水法、発芽試験技術が修得された。	休眠種子の発芽試験方法の確立。 発芽試験の処置。	△	休眠種子の発芽試験方法の確立。発芽試験が増える。 植物種数が増える。
4.1.4 活力	保存条件による活力の維持・低下について調べる。	4	寿命試験材料を用いて活力調査を行った。	恒温恒湿装置による活力試験。	×	
4.2 種子の保存	クリフカに必要な遺伝資源種子を長期間保存し、品種改良などに利用する。	3	1992年9月末現在、8地域農業研究センターで13種類、525点の栄養体が圃場保存されていることを、カワカホ-トと共に確認した。	圃場の保存方針に基づいて伝送立地への気配り、現状では保存率が不十分。	△	伝送立地への気配り、現状では保存率が不十分。 栄養繁殖作物の保存体制が確立する。
4.3 栄養体の保存 (圃場、ペリ)	クリフカに必要な遺伝資源栄養体として圃場保存し、品種改良などに利用する。	3	1992年9月末現在、8地域農業研究センターで13種類、525点の栄養体が圃場保存されていることを、カワカホ-トと共に確認した。	圃場の保存方針に基づいて伝送立地への気配り、現状では保存率が不十分。	△	栄養繁殖作物の保存体制が確立する。

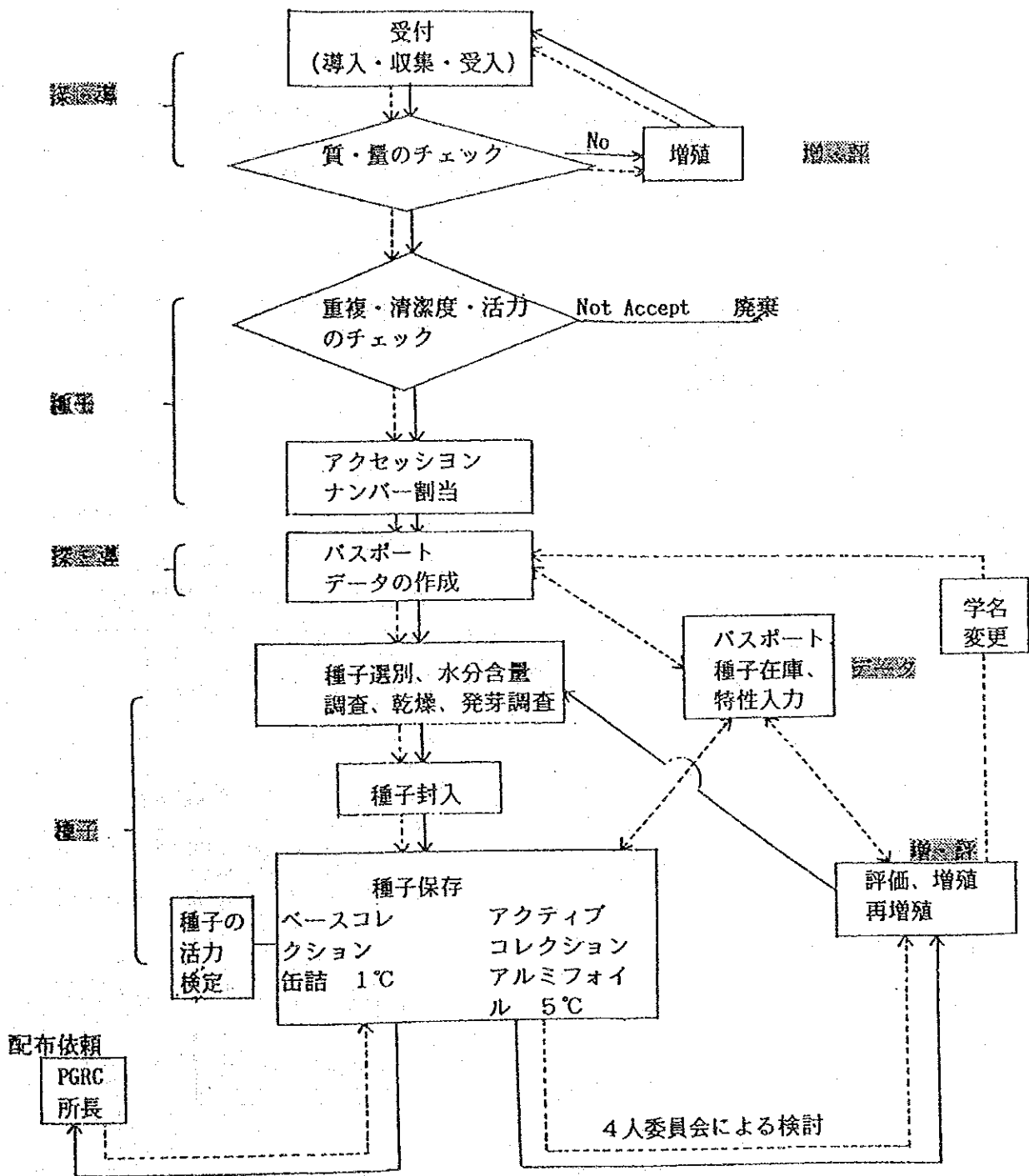
協力課題	目標	達成度	現状及びこれまでの成果	残された課題	必要性	延長の必要性及び延長による効果
4.4 In-Vitro保存 4.4.1 方法論の確立 4.4.1.1 大量増殖及び順化	栄養繁殖植物の大量増殖及び順化技術を確立する。	4	ハイブリッド、ホナ、ばれいしよの大量増殖及び順化技術を修得した。	マコ、シラス、ト、リツ、カブ、タ、シ、ツツなど、系統類の大量増殖及び順化技術の究用化。	×	
4.4.1.2 長期保存法	超低温保存法による栄養体の長期保存法を確立する。	1		凍結保存による小粒種子花粉、胚ならびに茎頂の長期保存。	×	(延長実施期間での実施は不可能)
4.4.1.3 細胞育種技術	細胞育種技術の導入により、葉さつま、まいも等の育種開発を図る。	1	ハイブリッド、さつままいも、ト、リツ、タ、シ、ツツの試みた。		×	(延長実施期間での実施は不可能)
4.4.2 茎頂培養系	栄養繁殖植物の保存に適用する。	4	ばれいしよ、さつままいも、ハイブリッド、ホナの茎頂培養技術を修得した。	葉柄のシ、マコ、シラス、カブ、ホ、イ、タ、シ、ツツ、マコ、シラスの茎頂培養技術の究用化。	×	
4.4.3 やく及び花粉培養系	固定系統を早期に得る技術に適用する。	5	やく及び花粉培養技術を修得し、特性評価中。	ハイブリッド、ホのやく培養技術。	×	

協力課題	目標	達成度	現状及びこれまでの成果		残された課題	必要性	延長の必要性及び延長による効果
			現状	これまでの成果			
5.1 5.1.1.1	増殖方法論の確立 種子生産	配布源種子の確保するための種子源を確保する。配種時に伝種方法を検討する。	3	は、豆類及び雑穀の栽培技術を移転した。	は、豆類、雑穀以外の植物栽培法の移得。	○	種子生産に必要ない種栽培技術の修得が進む。
5.1.1.2	増殖時の遺伝性保持の検討	増殖時に伝種方法を検討する。	2	は、品種あるいは系統に伝種・異株個体の除去技術を移転した。	他花授精率の高い植物の増殖法の工夫。	○	増殖時の遺伝性保持の重要性が認識される。
5.1.1.3	活性低下増殖法の増殖源	種子活力が低下し増殖が困難な遺伝源の増殖方法を検討する。	1	活力低下種子の増殖法は研究が進んでいない。		○	活力低下種子の増殖法が修得される。
5.2 5.2.1	増殖採取・導入増殖源の増殖	採取・導入した少量の増殖源の増殖方法を検討する。	2	少量種子の室内増殖法を維持した。	増殖のための栽培技術の改善修得。	○	増殖に必要な栽培技術の修得が進む。
5.2.2	保存増殖源の増殖	保存増殖源のうち、増殖力低下した種子の増殖方法を検討する。	2	同上	同上	○	同上

協力課題	目標	達成度	現状及びこれまでの成果	残された課題	必要性	延長の必要性及び 延滞による効果
5.1.1 情報管理 5.1.1.1 情報管理システム	PGRCの遺伝資源管理に 必要な情報管理システムを 作る。	4	PGRCにおける情報管理システムは できあがり、進行は徐々 ながら進捗している。	遺伝資源情報管理への 意欲と認識の向上。	×	
5.1.2 データ入力	PGRCの遺伝資源各部門 から集まるデータ、在庫データ、 (ハラスメントデータ、在庫データ、 特性評価データ、など) の入力を行う。	3	1992年9月末現在、ハラスメント データ6431点、品種判別特性 データ9892点を入力し、その 手法は修得された。	各部門下らのデータ送付が 遅れている。カクタンメントの データベース基礎知識の不足。	△	各部門からのデータの 送付が円滑になる。
5.1.3 データベースの構築	ハラスメントデータ、在庫データ、 特性評価データなどの データベースを構築し、遺伝 資源の情報管理に役立てる。	4	当面必要なデータベースの構築を 完了し、その手法は修得 された。	遺伝資源情報管理への 意欲と技術の向上。	×	
5.1.4 保存目録の作成	PGRCに保存する植物遺伝 資源の保存目録を作成 配布し、遺伝資源の積極的 な利用に役立てる。	2	遺伝資源のデータベースが僅か で当面保存目録の作成は困難。	遺伝資源データベースの入力促進。 入力データのアップ。	○	遺伝資源目録の作成。

協力課題	目標	達成度	現状及びこれまでの成果	残された課題	必要性	延長の必要性及び延長による効果	
						○	△
7 配布・交換、及び利用 7.1 配布（国内）	配布要請に応え、規程に基づき、伝送源を配布し、利用促進を図る。	2	1991年4月から1992年3月までの1年間に、保存伝送機関及び大学などに配布した。	国内の配布規定の制定。特性評価の作成。配布目録の作成。	△	配布条件が整う。	
7.2 交換（外国）	資源を有効に利用するため、海外諸国・機関と交換を行う。	2	1988年から1992年の国外からの導入点数は、1390点、国外への配布点数は300点であった。	同上	△	交換条件が整う。	
7.3 利用（育種素材）	保存伝送源の配布目録を関係機関に配布し、育種素材の有効利用を図る。	2	要請に応じ、国内育種機関に伝送源を配布した。	配布目録の印刷配布。特性評価データの作成、配布。	×	（自ら改善可能）	
8 自主管理運営 8.1 自主管理運営	本プロジェクトの目的は、PGRCを運営する事であり、PGRCの長期間中における自主管理運営を目指す。	1	1990年6月にPGRC運営源を保存管理式を定め、運営してきていない。関係がまだ約束が守られない。	PGRC運営源管理運営委員会の定期的開催と作成。	○	自主管理運営水準が上がる。	

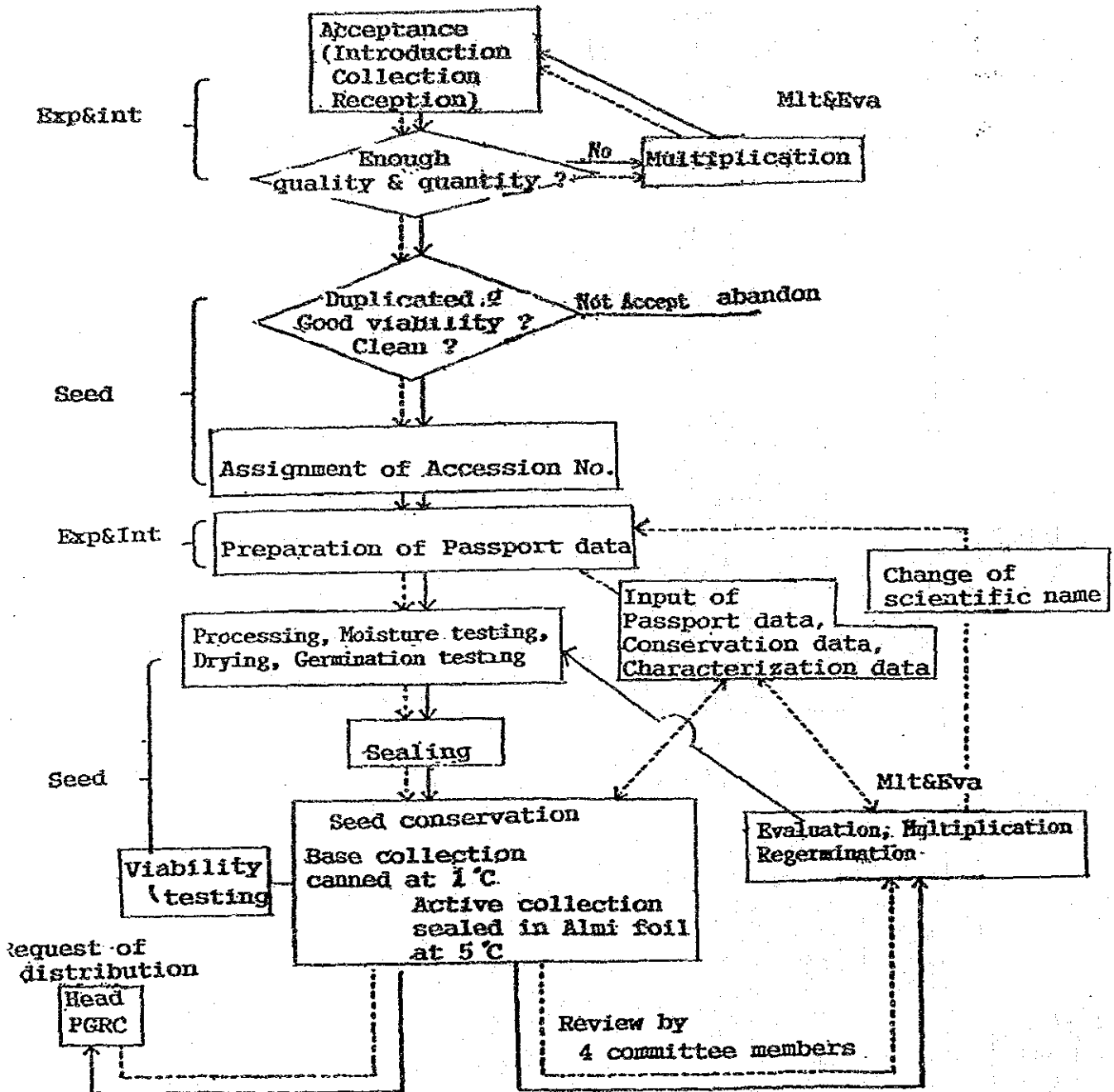
(参考3) 植物遺伝資源管理のフローチャート



探索 ; 探索・導入部門、 増殖・評価 ; 増殖・評価部門、 種子 ; 種子保存部門、
データ管理 ; データ管理部門

——— 種子の流れ
- - - - - 情報の流れ

Flow of Germplasm and Data at PGRC



Exp&Int : Exploration & Introduction Unit
 Mlt&Eva : Multiplication & Evaluation Unit
 Seed : Seed Conservation Unit
 Data : Data Management Unit

————— Seed flow
 - - - - - Data flow

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Ms. H.J. Warshakoon	R.A.	- do -
Ms. I.P.K. Jayawardhane	K.V.S.	Dip./School of Agriculture

Data Management and Documentation

Ms. S.C.J. Dissanayake	E.O.	B.Sc. (Peradeniya)
Mr. U. Siriyadasa	R.A.	Dip./School of Agriculture

Farm Management

Mr. R.M.R.U. Medagama	Farm Manager	Dip./School of Agriculture
Mr. R.R.U.N. Ratnayake	Agricultural Foreman	Practical Farm School
Ms. D.W.G.K. Marapana	K.V.S.	Practical Farm School

Maintenance, Repairs and Audio Visual

Mr. D.M. Tilakarathne	R.A.	Technical School Certificate - U.S.A.
Mr. D.M.S.K.W.B. Palipana	R.A.	Professional Certificate in Agriculture
Mr. R. Gunathunga	K.V.S.	Practical Farm School
Mr. L.G. Herath	Cinema Operator	

Administration

Ms. I. Samaranayaka	Chief Clerk	
Ms. D.M.S. Dharmasri	Clerk	
Mr. D.H. Panditharathne	Store Keeper	
Mr. A.H.M.W. Abeyrathne	Store Keeper	

Ms. M. Ranasinghe	Clerk II
Ms. T.S. Walgampaya	Clerk II
Ms. S.R. Piyadasa	English Typist
Ms. M. Madawela	English Typist

Long Term Japanese Experts

Dr. Shinji Watanabe	Team Leader	B.Sc. (Japan) Ph.D. (Tohoku, Japan) Plant Genetics
Mr. Shun Amma	Genetic Resources Management	B.Sc. (Japan) Plant Genetics
Mr. Kunio Ouchi	Genetic Resources Research	B.Sc. (Japan) Plant Breeding
Mr. Isao Tojo	Co-ordinator	B.Sc. (Kyoto) Agronomy

Local Consultant

Prof. M.D. Dassanayake	Taxonomy	B.Sc. (Ceylon) M.A. (Cantab) Ph.D. (Manchester)
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(参考5) 派遣専門家リスト

(1) 長期専門家

専門家	職種	PGRCでの担当	派遣
渡辺進二	リーダー	総括、管理運営	1988.9.6-1993.3.31
東條勇雄	業務調整	業務調整	1991.1.16-1993.1.15 * 1993.1.16-1993.3.31
安間舜	遺伝資源管理	種子保存、In-vitro保存、 データ管理	1989.2.7-1993.3.31
大内邦夫	栽培	増殖・評価	1991.9.16-1993.3.31
高橋順二	業務調整・栽培 増殖・評価	業務調整・増殖・評価	1988.8.9-1991.1.14
	栽培増殖・評価		1991.1.15-1991.8.8
鶴内孝之	遺伝資源研究	探索収集・導入・分類	1988.9.6-1991.9.5

注) * : 延長申請中

(2) 短期専門家

年度	専門家	所属	指導項目	指導場所	派遣期間
1988	梅原正道	農水省 農業生物資源研	データ管理	PGRC	1989.3.14-4.3
1988	江川宣伸	農水省 農業生物資源研	遺伝資源の 識別技術	PGRC	1989.3.14-4.10
1989	浅野義人	農水省 農業生物資源研	In-Vitro保存	PGRC	1989.6.26-7.27
1989	梅原正道	農水省 農業生物資源研	データ管理	PGRC	1989.8.24-9.16
1989	佐藤賢	農水省 農業生物資源研	種子生理	PGRC	1989.8.24-9.23
1990	庄島美香		データ管理	PGRC	1990.11.29-1991.6.12
1990	梶原英之	農水省 農業生物資源研	アミノ酸分析	PGRC	1991.3.2-3.29
1990	石毛光雄	農水省 農業生物資源研	In-Vitro保存	PGRC	1991.3.21-4.12
1991	阪本享男	京都大学農学部 植物生殖質研究施設	植物遺伝資源 探索	PGRC RARC・現地	1991.8.1-9.1
1991	中村俊一郎	東京農業大学 国際農業開発学科	種子生理	PGRC	1991.8.26-9.23

(参考6) 過去5ヵ年の供与機材額内訳

(単位:千円)

	現地調達分	本邦購送分	計
88年度	25,862	16,789	42,651
89年度	29,595	5,438	35,033
		7,500 *	7,500
90年度	13,068	19,916	32,984
91年度	キャンセル	16,436	16,436
92年度	14,000	10,000	24,000
計	82,525	76,079	158,604

注) *:繰り越し分

(参考7) プロ技協供与機材(1988-1992)

概ね1点10万円以上のものをあげる。また、類似のものは一括して示す。

(1) 1988年度

上記の無償機材を補強するため、当該年度に約4000万円相当の機材供与が行われた。主な機材は以下の通り。

1) 本邦購送分

自動車(ステーションワゴン)	2台
動力用播種機	2台
同上用管理機	2台
田植機(2条)	1台
田植機(4条)	1台
種子計数機	1台
自動種子精選機	2台
発芽試験機	1台
分析用精密天秤	1台
台秤	4台
製函机	1台
低温庫用防寒服	12セット
低湿型恒温恒湿機	1台
カメラ(一眼レフ)	1式
トランスイルミネーター	1台
シャーレローテーター	1台
スラブゲルドライヤー	1式
輪転機	1式
スライド作成機材	1式
化学薬品	110点
その他	50点

2) 現地購入分

タイプライター（英文及びシンハラ語）	1台
トラクタ（45HP）	1台
ディスクプラウ（同上用）	1台
トレーラー（同上）	1台
2輪トラクター、トレーラー共	1式
カメラ（一眼レフ）	1式
コピー機	1台
データキャビネット類	36台
種子標本展示台	1台
モーターバイク	2台
自転車	8台
コピー機	2台
刈払機	1台
化学薬品	12点
調整台・調査椅子等	1式
その他	12点

(2) 1989年度

上記の無償供与機材を補強するため、約3500万円相当の機材供与が行われた。主な機材は以下の通り。

1) 本邦購送分

ラップトップパーソナルコンピュータ	1式
同上ソフトウェア	3点
電気泳動装置（垂直型）	1式
ろ過ポンプ	1台
可変式マイクロピペット	3点（各2本）
その他実験用品	28点
庁舎メンテナンス用スペアパーツ類	1式
自動電圧調整用スペアパーツ類	1式
防火用制御盤	1式
消火栓制御盤	1式
消火栓始動継電函	
深井戸ポンプ制御盤	1式
自家発電機用スペアパーツ	1式
警報機制御盤	1式
火災報知器制御盤	1式
ポンプ室制御盤	1式

2) 現地調達分

マイクロバス	1台
乗用車	1台
プレハブ低温庫(地域ジーンバンク用)	3台
低湿型恒温恒湿機	1台
動力芝刈機	1式
ビデオ編集装置	1式
レーザープリンター	1台
トラック	1台

(3) 1990年度

当年度に約3750万円相当の機材供与が行われた。主な機材は以下の通り。

1) 本邦購送分

水中ポンプ(深井戸及び排水処理用のスベア)	3台
低温水槽	1台
ホモジナイザー	1台
フリーズドライヤー	1台
低温薬品保管棚	1台
ドライアイスメーカー	1台
フィルターポンプ	1台
真空ポンプ	1台
電気泳動用周辺装置	1式
雪状製氷機	1台
定温機	1台
通風乾燥機	1台
陽光型恒温機	1台
隔測自記温湿度計	1台
分離用超遠心機	1台
実験用備品類のスベア	6点
化学薬品	264点
その他実験及び試験園場用品	33点
通風乾燥機(地域ジーンバンク用)	2台
定温機(地域ジーンバンク用)	2台
電子天秤(地域ジーンバンク用)	2台
その他実験用品(地域ジーンバンク用)	3点

2) 現地調達分

種子保存冷蔵庫	6台
家庭用冷蔵庫	1台
コピー機	13台
背負い式スプレーヤ	12台

フィールドバランス	12台
ポリチンシーラ	12台
オシロスコープ	1台
リフトポンプ	1台
コンピュータ、及び定電圧装置	2台
プリンター	1台

(4) 1991年度

当年度に約1630万円相当の機材供与がなされた。主な機材は以下の通り。

1) 本邦購送分

穀粒透視器	1台
穀粒容積重計	1台
穀粒くし	3式
穀粒硬度計	1台
マグミキサー	1台
ゴムボート、及びライフジャケット	1式
電導率計	2台
クリーンベンチ	1式
缶試験器	1台
真空試験器	1台
棒状水銀湿度計	1式
交配用眼鏡	2個
交配用具セット	2式
果実硬度計	2台
粒計テスター	3台
アミノ酸分析器パーツ	81点
上皿電子天秤	1台
発芽試験器	5台
定温乾燥器	2台
PHメータ	1台
大豆水分計	2台
試験用粉碎器	1台
万能噴霧器	1台

2) 現地調達分

キャンセルにつき無し。

(5) 1992年度(要求中)

当年度に約2424万円相当の機材供与がなされる予定。主な要求機材は以下の通り。

1) 本邦贈送分

空調機	2台
除湿機	1台
低温乾燥機	1台
液体窒素タンク	2台
薬品	1式
シェイカー	1台
オーバーヘッドプロジェクター	1台
排水スペアパーツ	1式
発電機スペアパーツ	1式
音響スペアパーツ	1式
農機具スペアパーツ	1式

2) 現地調達分

種子保存冷蔵庫	1台
種子乾燥オーブン	1台
薬品	1式
実験器具	1式
低温型ドライヤー	1台
穀粒テスター	1台
農薬・肥料類	1式
コンピュータソフトウェア、及び周辺機器	1式
車両タイヤ、及びスペアパーツ	1式

(参考8) 無償供与機材リスト

1. 研究棟

地上2階建 延 3,110.208m²

6つの研究室ユニットと共用諸室で構成されており、各研究ユニットの相互連携から1階に種子保存研究、探索・収集研究、情報管理、セミナー室、図書室を配し、2階に栄養系繁殖作物研究、評価研究、開発研究ユニット、共用検査諸室が配されている。夜間研究を行う研究員のために仮眠室を設けられており24時間体制の研究に利用する。

主要諸室： 種子検査諸室、栄養系作物繁殖保存研究室、探索・収集研究室、情報管理室、評価研究室、開発研究室、暗室、天秤室、標本準備室、顕微鏡室
夜間当直室3室、セミナー室2室、図書資料室、研究員室5室、主任研究員室5室

2. 実験用圃場

4,420m²

作物栽培、種子収集に用いる

3. 主要機材

(1) 圃場管理部門

種子乾燥器、小型稲脱穀器、手動とうもろこし脱粒器、ドッケージテスター、種子選別アスピレーター、脱ほう機、簡易穀物水分計、上皿天秤、台秤、トラクター、耕耘機、スプリンクラー、ガス検知機

(2) 種子貯蔵庫

種子貯蔵アルミ缶、種子貯蔵容器

(3) 種子乾燥・包装室

種子仕上乾燥機、真空缶詰機、真空アルミ蒸着袋密閉機、簡易穀物水分計、上皿天秤

(4) 種子検査・発芽実験室

拡大鏡、赤外線式水分計、簡易穀物水分計、穀物容積重量計、粒型テスター、乾燥機、実態顕微鏡、粒数測定機、穀粒縮分器、上皿卓秤、上皿天秤、ラボカート

(5) 栄養系作物繁殖保存研究室

乾燥滅菌機、オートクレーブ、恒温水槽、浸透恒温水槽、電子レンジ、蒸留水製造装置、クリーンベンチ、ドラフトチャンバー、電子天秤、自動分注器、試験管ミキサー、加熱マグネテックスターラー、冷却マグネテックスターラー、フィルターホルダー、Phメーター、ピーカー乾燥棚、超音波洗

洗浄器、ロータリー式培養浸透器、往復式浸透培養器、化学薬品用冷蔵庫、倒立顕微鏡、ループ殺菌器、ヘマシトメーター、蛍光灯付き棚

(6) 情報管理室

パーソナルコンピューターハードウェアセット、情報分析用ソフトウェア、カードファイルキャビネット、データファイル棚

(7) 探索・収集研究室

高温度計、簡易式Phメーター、粒型テスター、簡易穀物水分計、携帯用気象観測装置、アイスボックス、カメラ、上皿卓秤、上皿天秤、植物標本用ラック、種子標本用ラック、冷蔵庫、ラボカート、検索収集用車輛

(8) 評価研究室

塩度計、テンションメーター、簡易土壌水分計、茎しょう挫折強度試験器、照度計、葉緑素計、葉面積計、ボラニメーター、簡易式Phメーター、簡易穀物水分計、赤外線式温度計、試験とう摺機、試験精米機、マグネティック・スターラー、乾燥機、上皿天秤、化学薬品冷蔵庫、薬品棚

(9) 開発研究室

超低温庫、自動乳鉢、マグネティック・スターラー、遠心分離機、Phメーター、ウイレー粉碎器、ロータリーエバポレーター、乾燥機、真空乾燥機、真空ポンプ、オートクレーブ、ドラフトチャンバー、ケルダール窒素分析セット、ソックスレー脂肪分析セット、電気泳動装置、アミノ酸加水分解試験管、アミノ酸加水分解装置、超音波洗浄器、上皿天秤、遠沈管比重計、冷蔵庫、蒸留水製造装置、薬品棚

(10) 共通検査諸室

直示天秤、電子天秤(以上天秤室)、実態顕微鏡、実習用生物顕微鏡、研究用生物顕微鏡写真撮影装置付き検鏡台(以上顕微鏡室)、ミクロトーム、自動固定包埋装置、パラフィン溶融器、パラフィン包埋枠、排気装置(以上標本準備室)、低温恒温器、高温恒温器、回転培養器、白黒フィルム現像プリントセット、自動温湿度計、自記雨量計、日照計

(11) セミナー室

スライド映写機、オーバーヘッド映写機、視聴覚セミナー用撮影セット、視聴覚セミナー用映写セット、小型スライド映写機、視聴覚セミナー用録音再生器

(12) 事務室

複写機、タイプライター、ワードプロセッサー、製本セット

(13) 大会議室

16mm映写機、スライド映写機、オーバーヘッド映写機、カセットテープレコーダー、スピーカー用アンプ、スピーカー、マイクロホン、卓上用マイクロホンスタンド、床上用マイクロホンスタンド、ワイヤレスアンプ、ワイヤレスアンテナ、ワイヤレスマイク

4. 機材リスト

(1) 昭和62年度分

① 長期貯蔵庫

Long-term Storage

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 種子貯蔵アルミ缶 Seed Containing Can	75,000	64	4,800,000	Small Can No.2 (Daiwa Can)
(2) 種子貯蔵缶容器 Can Container	25,000	800	20,000,000	Special (Yamato)
(3) ケース Case	750	5,900	4,425,000	Special (Yamato)
(4) 脚立 Trestle	1		31,000	TCS-15 (Nihon Alumi)

② 中期貯蔵庫

Medium-term Storage

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 種子貯蔵容器(小) Seed Container (Small)	25,000	660	16,500,000	Special (Yamato)
(2) アルミ蒸着袋(小) Seed Envelop (Small)	75,000	11	825,000	Special (Ryuzan Shoji)
(3) ケース Case	2,100	5,900	12,390,000	Special (Yamato)
(4) シリカゲル Shilica Gel	2,500	1,200	3,000,000	(Sekiya)
(5) 脚立 Trestle	1		31,000	TCS-15 (Nihon Alumi)

③ 短期貯蔵庫

Short-term Storage

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 種子貯蔵容器(大) Seed Container (Large)	1,500	4,800	7,200,000	Special (Yamato)
(2) アルミ蒸着袋(大) Seed Envelop (Large)	30,000	17	510,000	Special (Ryuzan Shoji)
(3) シリカゲル Shilica Gel	750	1,200	900,000	(Sekiya Rika)
(4) 脚立 Trestle	1		31,000	TCS-15 (Nihon Alumi)

④ 種子乾燥・包装室

Seed Draying & Packing Room

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 種子仕上乾燥機(大) Seed Finishing Dryer (Large)	2	7,285,000	14,570,000	80S-8HEE (Kawaguchi)
(2) 種子仕上乾燥機(小) Seed Finishing Dryer (Small)	1		5,245,000	20S-16HEE (Kawaguchi)
(3) 真空缶詰機 Vacuum Canning Machine	1		5,200,000	0 Type (Hashimoto)
(4) 真空アルミ蒸着袋密閉機 Vacuum Sealer for Alminium Evaporated Envelope	2	290,000	580,000	V-300 (Fuji Impulse)
(5) 簡易穀物水分計 Moisture Meter (Labo. Type)	2	520,000	1,040,000	PV-100 (KETT)
(6) 種子受皿 Seed Pan, Plastic Seed Pan, Steel	500	420	210,000	M7 (Aron)
	500	960	480,000	737-51-11-05C (Tokyo Glass)
(7) 種子袋 Seed Cloth Bag	1set		3,750,000	Special (Sekiya Rika)
(8) ラベリングセット Labeling Set	2sets	630,000	1,260,000	RB, BB/No. 75 (Iuchi)
(9) 上皿秤(小) Top-pan Balance (Small)	2	8,500	17,000	2-3-8 (Murayama)
(10) 上皿天秤 Table Balance	2	19,000	38,000	3-6-6 (Murayama)
(11) 台車 Labo Cart	1		200,000	A-500 (Tokyo Glass)

⑤ 種子処理機器

Seed Processing

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 種子乾燥器 Seed Dryer	1		1,100,000	TDR-36A (Satake)
(2) 小型稲脱穀機 Miniture Thresher for Paddy	2	750,000	1,500,000	181-B (Kiya)
(3) 手動とうもろこし脱粒器 Hand Maize Thresher	2	34,000	68,000	CM-01 (Kiya)
(4) ドックゲージテスター Dockage Tester	1		2,700,000	NH-6 (Carter)
(5) 種子選別アスピレーター Aspirator for Seed Selection	2	530,000	1,060,000	151-A (Kiya)
(6) 脱ぼう機 Avn Remover	1		350,000	183-C (Kiya)
(7) 篩セット Sieve Set (Large)	2sets	150,000	300,000	(Sekiya Rika)
(8) 種子乾燥箱 (大) Seed Drying Tray (Large)	50	19,000	950,000	(Sekiya Rika)
(9) 種子乾燥箱 (小) Seed Drying Pan (Small)	100	5,200	520,000	(Sekiya Rika)
(10) 簡易穀物水分計 Grain Moisture Meter (Portable Type)	2	100,000	200,000	Grainer (KETT)
(11) 穀物水分計 Grain Moisture Meter	1		520,000	PV-100 (KETT)
(12) 採種用脱穀機 Seed Collecting Thresher	1		500,000	TS (Kiya)
(13) 上皿秤 (大) Top-pan Balance (Large)	2	10,500	21,000	2-3-10 (Murayama)
(14) 台秤 Platform Scale	1		80,000	4-13-4 (Murayama)
(15) 種子袋 Seed Cloth Bag	1set		3,750,000	Special (Sekiya Rika)

⑥ 圃場機械

Agri. Machinery for Field Work

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) トラクター Tractor	1		1,400,000	L295DT-11 (Kubota)
(2) トラクター用 Attachments for Tractor	1set		1,180,000	FL1020/452S, TDP222- DH01616, TSC-7 (Kubota)
(3) 耕云機 Hand Tractor	1		310,000	K120×RK105 (Kubota)
(4) 耕云機用アタッチメント Attachments for Hand Tractor	1set		284,000	K120×RK105/ MR83NO/DZ-2B (Kubota, Matsuyama)
(5) 機械工具セット Maintenance Tools Set	1set		136,000	700AX etc. (Kimachi)
(6) 水工具セット Woodwork Tools Set	1set		160,000	5800NB, 6000R, 1911B (Makita)
(7) 噴霧器(大) Handsprayer (Large)	2	60,000	120,000	253(M) (Kiya)
(8) スプリンクラー Sprinkler Set	1		3,176,000	Special (Green)

⑦ くん蒸機器

Fumigation

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) ガス検知機(A) Gas Detector (A)	1		20,000	Kitagawa 400S (Komyo Rikagaku)
(2) ガス検知機(B) Gas Detector (B)	1		18,000	Torch Type (Takagi Tekko)
(3) ガス検定器 Gas Inspector	1		205,000	Type 18 (Riken Keiki)
(4) くん蒸箱 Fumigation Chamber	1		3,220,000	KS SUS-Box Type (Kanto Kogyo)
(5) ガスマスク Gas Mask	3	18,000	54,000	Type A (Sanko Kagaku)

⑧ 簡易グリーンハウス

Net Houses

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 栽培ポット (大) Culture Pot for Paddy(Large)	500	3,800	1,900,000	171 (1/2000a) (Kiya)
栽培ポット (小) Culture Pot for Paddy(Small)	500	1,800	900,000	171 (1/5000a) (Kiya)
(2) 畑作物栽培ポット (大) Culture Pot for Upland Crop (Large)	500	3,800	1,900,000	171-B (1/2000a) (Kiya)
畑作物栽培ポット (中) Culture Pot for Upland Crop (Medium)	500	1,800	900,000	171-B (1/5000a)
畑作物栽培ポット Culture Pot for Upland Crop (Small)	500	900	450,000	171-C (Kiya)
(3) 噴霧器 (小) Hand Sprayer (Small)	5	44,000	220,000	250(L) (Kiya)
(4) 自記温湿度計 Hydro-Thermograph	5	115,000	575,000	3-A (Ohta Keiki)
(5) 温湿度計 Hydro-Thermometer	5	15,000	75,000	TH-3 (Ohta Kekiki)
(6) 台車 Cart for Culture Pot	5	80,000	400,000	OH-1 (Vanlack)
(7) 土壌混合機 Soil Mixer	1		1,100,000	317 (11) KOM-11 (Kiya)
(8) 防虫ネット Insect Screen	10	9,500	95,000	(Sekiya Rika)

⑨ ピックアップトラック

Pick-up Truck

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) ピックアップトラック Pick-up Truck	1	1,279,000	1,279,000	L200 (Mitsubishi)

(2) 昭和63年度分

① 種子検査・発芽試験室

Seed Inspection & Germination Test Room

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 発芽試験(大) Germinator (Large)	2	4,614,400	9,228,800	TGL-30L (Kiya)
(2) 発芽試験(小) Germinator (Small)	1		2,366,400	TGL-20 (Kiya)
(3) 発芽試験皿 Tray for Germination Test	1,000	1,400	1,400,000	2-072-09 (Iuchi)
(4) ふるいセット(中) Sieve Set	2	155,200	310,400	(Sekiya)
(5) 鏡板 Mirror Plate	2	31,000	62,000	105-E(L) (Kiya)
(6) 拡大鏡 Enlarger Scope	1		56,000	SKK-CL (Kiya)
(7) 赤外線式水分計 Infra-red Grain Moisture Meter	2	132,500	265,000	F-1A (KETT)
(8) 簡易穀物水分計 Grain Moisture Meter (Portable Type)	2	100,000	200,000	Grainer (KETT)
(9) 簡易穀物水分計 Grain Moisture Meter (Labo. Type)	1		520,000	PV-100 (KETT)
(10) 穀物容積重量計 Grain Volume Measurer	1		126,200	125 (Kiya)
(11) 種子受皿 Seed Pan, Plastic Steel	100 100	420 960	42,000 96,000	M7/ (Aron Kasei)
(12) 粒型テスター Grain Micrometer	2	39,400	78,800	RT-20 (Kiya)
(13) 乾燥器 Drying Oven	1		614,800	DF-62 (Yamato)
(14) 実体顕微鏡 Stereo Microscope	1		263,800	SMZ-1-2 (Nikon)
(15) 秤量缶 Aluminium Can with Cover (Weighing Can)	50	660	33,000	(Sekiya)
(16) 粒数測定器 Seed Counter	1		1,089,200	KC-1 (Kiya)
(17) 穀粒縮分器 Grain Sample Divider	1		252,400	103-B(L) (Kiya)
(18) 上皿天秤 Double Beam Balance	1		97,000	1560SD (Yamato)
(19) 上皿天秤 Table Balance	2	10,000	38,000	3-6-6 (Murayama)

機材名	量	単価 ￥	金額 ￥	Model No. (メーカー名)
(20)乾燥棚 Drying Rack	1		181,400	DS-1C (Yamato)
(21)ラボカート Labo. Cart	1	108,800	108,800	SWC (Yamato)

② 栄養系繁殖研究室

Sterilizing Room

機材名	量	単価 ￥	金額 ￥	Model No. (メーカー名)
(1) 乾熱滅菌器 (小) Drying Sterilizer (Small)	1		289,200	SG-42 (Yamato)
(2) 乾熱滅菌器 (大) Drying Sterilizer (Large)	1		622,000	SG-81 (Yamato)
(3) オートクレーブ (大) Autoclave	1		750,000	SM-51 (Yamato)
(4) 恒温水槽 Water Bath	1		305,400	BK-33 (Yamato)
(5) 振盪恒温水槽 Water Bath with Shaker	1		520,200	BT-47 (Yamato)
(6) 電子レンジ Electronic Oven	1		155,500	MR-6610 (Hitachi)
(7) 蒸留水製造装置 (大) Auto Still (Large)	1		1,697,700	WA-73 (Yamato)
(8) 滅菌缶 Sterilization Can	5	7,200	36,000	(Sekiya)

③ 培地調整・実験室

Medium Preparation & Experiment Room

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) クリーンベンチ Clean Bench	2	1,899,300	3,798,600	PCH-1913B (Hitachi)
(2) ドラフトチャンバー Draft Chamber	1		1,500,100	FRS-180P (Yamato)
(3) 直示天秤、天秤台付 Analytical Precision Balance with Table	1		890,100	AE-240/FBT2-90 (Mettler, Yamato)
(4) 電子天秤 Electrical Top-pan Balance	2	209,200	418,400	LY-3100 (Yamato)
(5) 試験管ミキサー Tube Mixer	1		105,400	MT-51 (Yamato)
(6) 加熱マグネティック スターラー Magnetic Stirrer with Hot Plate	1		126,500	MH-81 (Yamato)
(7) 冷却マグネティック スターラー Magnetic Stirrer with Cold Plate	1		267,900	COP-120 (Toyo)
(8) 自動分注器 Auto Dispensor	1		564,900	FH-100D (Hirasawa)
(9) フィルターホルダー Filter Holder	2	98,000	196,000	KGS-47 etc. (Toyo)
(10) PHメーター PH Meter (Labo. Type)	1		442,600	F-14 (Horiba)
(11) 塩度計 Salinity Meter	1		164,200	SH-7 (Horiba)
(12) 乾燥棚 Drying Rack	1		181,400	DS-1C (Yamato)
(13) ビーカー乾燥棚 Drying Rack for Beaker	1		43,600	1-079-01 (Iuchi)
(14) 超音波洗浄器 Ultrasonic Cleaner	1		346,000	5200-J4 (Branson)
(15) ロータリー式培養振盪器 Culture Flask Shaking Incubator (Rotatin Type)	1		603,600	SLR-20T (Ikeda)
(16) 往復振盪培養器 Culture Flask Shaking Incubator (Reciprocating Type)	1		325,900	SA-31 (Yamato)
(17) 篩セット(小) Sieve Set	1		23,600	(Sekiya)

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(18)ラベリングセット Labeling Set	1		626,700	BB/No.75 (Iuchi/Lion)
(19)化学薬品用冷蔵庫 Freezer for Chemicals	1		678,400	MPR-510R (Sanyo)
(20)致立顕微鏡写真撮影装置付 Inverted Microscope with Photomicrographic Attachment	1		1,600,700	TMD, F-301 (Nikon)
(21)実体顕微鏡 Stereo Microscope	1		263,800	SMZ-1-2 (Nikon)
(22)ループ殺菌器 Loop Cinerator	2	96,100	192,200	SL-21 (Yamato)
(23)ヘマシトメーター Haemacytometer	1		28,100	03-100-1 (ERMA)
(24)コロニーカウンター Colony Counter	1		264,700	CC-21 (Yamato)
(25)薬品棚 Shelf for Chemicals	1		251,000	NLM-120 (Yamato)
(26)ラボカート Labo. Cart	2	108,800	217,600	SWC (Yamato)

④ 培養貯蔵室

Storage for Cultured Tissue

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 蛍光灯付棚 Shelf with Fluorescent Lamp	20	214,250	4,285,000	Special (Yamato)

⑤ 情報管理室

Laboratory for Data Management

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) パーソナルコンピューター ハードウェアセット Personal Computer with Display & Printer	2	1,611,100	3,222,200	System 2/60 (IBM)
(2) 情報処理分析用ソフトウェ ア Software for Data Processing & Anlysis with Graphic Function	2	808,900	1,617,800	(IBM)
(3) カード,ファイル,キャビネット Data Card Filing Cabinet	5	104,400	522,000	A5-026 (Kokuyo)
(4) データ,ファイル棚(大) Data Filing Cabinet (Large)	15	106,800	1,602,000	RL-F77 (Kokuyo)
(5) データ,ファイル棚(小) Data Filing Cabinet (Small)	10	63,800	638,000	RL-F27 (Kokuyo)

⑥ 探索・収集研究室

Laboratory for Exploration and Collection

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) キャンプセット Camping Set	1		299,800	(Mizuno)
(2) 高度計 Altimeter	2	89,900	179,800	No.10 (Ohta)
(3) 簡易式PHメーター PH Meter	2	82,400	164,800	LC-7 (Central)
(4) 傾斜計 Clinometer	2	10,400	20,800	1515-C (Kiya)
(5) 種子受皿 Seed Pan, Plastic	100	420	42,000	M7/-
Seed Pan, Steel	100	960	96,000	(Aron)
(6) 篩セット(中) Sieve Set	2	155,200	310,400	(Sekiya)
(7) 鏡板 Millor Plate	2	31,000	62,000	105-E(L) (Kiya)
(8) 粒型テスター Grain Micrometer	2	39,400	78,800	RT-20 (Kiya)
(9) 簡易穀物水分計 Grain Moisture Meter	2	100,000	200,000	Grainer (KETT)

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(10)携帯用気象観測装置 Portable Weather Instrument Set	1		183,600	No.69 (Ohta)
(11)標準土色粘 Standard Soil Color Chart	2	16,400	32,800	309-B (Kiya)
(12)アイスボックス Ice Box	2	15,700	31,400	35 (Iuchi)
(13)カメラ Camera	1		224,800	FA (Nikon)
(14)上皿天秤 Double Beam Balance	1		97,000	1560SD (Yamato)
(15)上皿天秤 Table Balance	2	19,000	38,000	3-6-6 (Murayama)
(16)植物標本用ラック Rack for Herbarium	6	108,600	651,600	MC-AON (Kokuyo)
(17)種子標本用ラック Rack for Seed Specimen	1		591,900	SK-B33M (Kokuyo)
(18)巻尺 Measuring Tape	2	14,900	29,800	WNR-652 (KDS SCALE)
(19)冷蔵庫(大) Refrigerator for Sample Seed	1		365,800	SR-494F (Sanyo)
(20)ラボカート Labo. Cart	1		101,100	SWA (Yamato)
(21)検索収集用車輛 Station Wagon for Exploration & Collection	2	2,148,900	4,297,800	PAJERO (Mitsubishi)

⑦ 評価研究室

Laboratory for Evaluation

機材名	量	単価 円	金額 円	Model No. (メーカー名)
(1) 塩度計 Salinity Meter	1		164,200	SH-7 (Horiba)
(2) テンションメーター Tension Meter	2	300,800	601,600	345-G (Kiya)
(3) 簡易土壌水分計 Soil Moisture Meter	1		92,300	J-3 (KETT)
(4) 茎稈挫折強度試験器 Straw Franture Tester	1		280,400	135-B (Kiya)
(5) 照度計 Lux Meter	1		32,900	167-B (Kiya)
(6) 葉緑素計 Chlorophyll Meter	1		442,000	SPAD-501 (Kiya)
(7) 葉面積計 Leaf Area Meter	1		758,800	GA-5 (Kiya)
(8) プラニメーター Planimeter	1		148,400	Planix (Tamaya)
(9) ポロメーター Porometer	1		7,087,300	LI-1600 (Meiwa)
(10) 簡易式PHメーター PH Meter	2	82,400	164,800	LC-7 (Central)
(11) 簡易穀物水分計 Grain Moisture Meter	1		100,000	Grainer (KETT)
(12) 昆虫飼育箱 Insect Reading Box	5	20,100	100,500	SG-503-1 (Kiya)
(13) 手持噴霧機 Hand Sprayer	5	16,400	82,000	257(M) (Kiya)
(14) 標準土色粘 Standard Soil Colour Chart	2	16,400	32,800	309-B (Kiya)
(15) デジタル表示湿度計 Digital Hygrometer	1		453,600	AY-21 (Yamamoto)
(16) 赤外線式温度計 Infre-red Thermometer	1		1,287,000	DHS-24X (Wahl)
(17) 試験籾摺機 Test Rice Husker	1		956,700	TH-35 (Nissha)
(18) 試験精米機 Test Rice Mill	1		206,200	VP-30T (Yamamoto)
(19) 種受皿 Seed Pan	50	420	21,000	M7 (Aron)
(20) 真空除雄器 Vacuum Emasculator	1		150,700	52-10(C) etc. (Kiya)

機材名	量	単価 円	金額 円	Model No. (メーカー名)
(21)マグネティック・スターラー (小) Magnetic Stirrer	1		56,900	MD-41 (Yamato)
(22)手動遠心器 Centrifuge	1		32,100	H-12A (Kokusan)
(23)乾燥器 Oven	1		488,200	Dn-63 (Yamato)
(24)上皿天秤 Table Balance	2	19,000	38,000	3-6-6 (Murayama)
(25)薬品棚 Shelf for Chemicals	1		251,000	NLM-120 (Yamato)
(26)化学薬品用冷蔵庫 Refrigerator for Chemicals	1		678,400	MPR-510R (Sanyo)
(27)乾燥棚 Drying Rack	1		181,400	DS-1C (Yamato)
(28)ラボカート Labo. Cart	1		108,800	SWC (Yamato)

⑧ 開発研究室

Laboratory for Visiting Scientists

機材名	量	単価 円	金額 円	Model No. (メーカー名)
(1) 超低温庫 Deep Freezer	1		2,109,800	MDF-391AT (Sanyo)
(2) 自動乳鉢 Auto Mortar Grinder	1		368,900	UT-21 (Yamato)
(3) マグネティック・スターラー (大) Magnetic Stirrer	1		114,500	M-66 (Yamato)
(4) 遠心分離器 Centrifuge	1		1,844,300	RL-7000 (Tomy)
(5) PHメーター PH Meter (Labo. Type)	1		442,600	F-14 (Horiba)
(6) ウィレー粉砕器 Micro Hammer Cutter Mill	1		728,800	MFC (Japan Machinery)
(7) ホットプレート Hot Plate	1		58,300	HK-21 (Yamato)
(8) ロータリーエバポレーター Rotary Evaporator	1		331,800	RE-52A (Yamato)
(9) 乾燥器 Oven	2	488,200	976,400	DN-63 (Yamato)

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(10)真空乾燥器 Vacuum Oven	1		280,300	DP-22 (Yamato)
(11)真空ポンプ Bacuum Pump	1		150,000	PD-102 (Yamato)
(12)オートクレーブ(小) Autoclave	1		420,500	SP-21 (Yamato)
(13)ドラフトチャンバー Draft Chamber	1		1,500,100	FRS-180P (Yamato)
(14)ケルダール窒素分析セット Kjeldahl Apparatus Set	1		261,800	(Sekiya)
(15)ソックスレー脂肪分析セット Soxhlet's Apparatus Set	1		278,800	BS-65 (Yamato)
(16)電気泳動装置 Electrophoresis Apparatus Set for Isozyme with Power Supply	2	2,385,300	4,770,600	EPA-600 etc. (Gallen Kamp)
(17)アミノ酸加水分解試験管 with Vacuum Apparatus	1		2,118,500	(Nihon Waters)
(18)アミノ酸加水分析装置 Amino Acid Analyzer	1		10,441,600	K-202SN (Kyowa Seimitsu)
(19)超音波洗浄器 Ultrasonic Cleaner	1		346,000	5200-J4 (Branson)
(20)上皿天秤 Table Balance	2	19,000	38,000	3-6-6 (Murayama)
(21)遠沈管比重計 Centrifuge Tube Balance	1		28,000	BR-01, 03 (Kokusan Enshinki)
(22)冷蔵庫(小) Freezer	1		678,400	MPR-510R (Sanyo)
(23)蒸留水製造装置 Auto Still	1		1,027,200	WA-53 (Yamato)
(24)薬品棚 Shelf for Chemicals	1		251,000	NLM-120 (Yamato)
(25)乾燥棚 Drying Rack	1		181,400	DS-1C (Yamato)
(26)ビーカー乾燥棚 Drying Rack for Beaker	1		43,600	1-079-01 (Iuchi)
(27)ラボカート Labo. Cart	1		108,800	SWC (Yamato)

⑨ 天秤室

Room for Balance

機材名	数	単価 円	金額 円	Model No. (メーカー名)
(1) 直示天秤 Analytical Precision Balance with Table	1		688,200	AE-200, FBT2-90 (Mettler)
(2) 電子天秤 (B), 天秤台付 Electrical Top-pan Balance	2	465,600	931,200	LV-310, FBT-90 (Yamato)
(3) 電子天秤 (C) Electrical Top-pan Balance	2	103,800	207,600	ACE-300 (Yamato)

⑩ 顕微鏡室

Room for Microscope

機材名	量	単価 円	金額 円	Model No. (メーカー名)
(1) 実体顕微鏡 Stereo Microscope	2	263,800	527,600	SMZ-1-2 (Nikon)
(2) 実習用生物顕微鏡 Student Microscope	2	254,500	509,000	SEB-3 (Nikon)
(3) 研究用生物顕微鏡写真撮影 装置付 Bio-microscope with Photomicrographic Attachment	1		1,575,400	XF-21, AFX (Nikon)
(4) 検鏡台 Table for Microscope	1		206,000	MTZ-150 (Yamato)

⑪ 顕微鏡標本作成室

Room for Microscope Sample Preparation

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) ミクロトーム Microtome	1		484,800	LS-113 (Yamato)
(2) 自動固定包埋装置 Automatic Tissue Processor	1		1,193,400	RH-12EP (Sakura Fine)
(3) パラフィン溶融器 Paraffin Oven	1		407,700	PM-401-1 (Sakura Fine)
(4) パラフィン伸展器 Paraffin Warming Plate	1		244,300	PS-52C (Sakura Fine)
(5) パラフィン包埋枠 "L" Mould with Plate	1		27,300	(Sekiya Rika)
(6) 染色槽 Staining Vessel	10	1,800	18,000	(Tokyo Glass)
(7) 排気装置 Fume Hood	1		331,500	LGU-1 (Sakura Fine)

⑫ 培養

Room for Incubator

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 低温恒温器 Low Temp. Incubator	2	762,300	1,524,600	IN-81 (Yamato)
(2) 恒温恒温器 Growth Chamber	1		1,883,660	KG-106SHL-D Special (Koito)
(3) 回転培養器 Rotary Incubator	2	1,095,900	2,191,800	3081-B (Kiya)

⑬ 暗室

Dark Room

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 白黒フィルム現像プリント セット Development & Printing Set for Black & White Film	1		692,000	(Fujikoshi)

⑭ 気象観測器具

Meteorology

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 百葉箱 Weather Instrument Screen	1		296,200	No.74 (Ohta Keiki)
(2) 自記温湿度計 Hygro-Thermograph	1		115,000	No.3-A (Ohta Keiki)
(3) 風向・風速計 Combination Anemometer	1		146,600	No.24 (Ohta Keiki)
(4) 自記雨量計 Recording Raingauge	1		201,400	No.34 (Ohta Keiki)
(5) 日照計 Sunshine Gauge	1		92,600	(Ohta Keiki)
(6) 日照計 Actinograph	1		184,200	No.44 (Ohta Keiki)

⑮ 実験室小物・ガラス器具

Laboratory Glassware and Miscellaneous

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) Laboratory Glassware and Miscellaneous	1		45,100,000	(Sekiya Rika)

⑯ 事務室

Administrative Office

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) 複写機 Copying Machine	1		696,000	NP-3225 (Canon)
(2) 印刷機 Printing Machine	1		638,000	GOM-770, 519 (Gakken)
(3) タイプライター Type-writer	2	318,700	637,400	EM-811, 1000 (Brother)
(4) ワードプロセッサ Word Processor	1		585,100	System 2/30 (IBM)
(5) 製本セット Book Binding Apparatus	1		231,500	(PLUS)

⑰ セミナー室

Seminar Room

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
(1) スライド映写機 Slide Projector (Large)	1		150,500	TM-252 (ELMO)
(2) オーバーヘッド映写機 Overhead Projector	1		250,300	MP-2450LV (ELMO)
(3) 映写機用スタンド Stand for Projector	2	34,600	69,200	(Gakken)
(4) 視聴覚セミナー用撮影セット Video Camera Set	1		424,500	NV-M7EN (Panasonic)
(5) 視聴覚セミナー用映写セット Video Television Set	1		424,500	TC-2080XR, NV- G50PX (Panasonic)
(6) 小型スライド映写機 Slide Projector (Small)	1		60,600	Twin Cabin Super (Cabin)
(7) 視聴覚セミナー用録音再生器 Stereo Cassette Recorder	1		36,400	TRK-W27W (Hitachi)

機材名	量	単価 ¥	金額 ¥	Model No. (メーカー名)
ADD. 複写機 Copying Machine	1		473,000	NP-3225 (Canon)

(参考9) 調査団派遣実績 (プロ技)

1. 事前調査団……………86年7月5日～7月12日

氏名	担当	所 属
渡 辺 進 二	(総括)	農林水産省農業生物資源研究所 生殖質保存管理室長
新 野 謙 司	(協力企画)	農林水産省経済局国際部 国際協力課課長補佐
町 田 哲	(業務調整)	国際協力事業団農林水産計画調査部 農林水産技術課

2. 実施協議調査日……………88年3月8日～3月17日

団 長	渡 辺 進 二	農林水産省	農業生物資源研究所 遺伝資源管理科長
協力企画	高 沢 寛	農林水産省	技術会議事務局 国際研究課課長補佐
遺伝資源研究	岡 三 徳	農林水産省	農業生物資源研究所 主任研究員
教 培	鶴 内 孝 之	長 崎 県	総合農林試験場作物部長
技術交流	高 橋 順 二	国際協力事業団	国際協力専門員
業務調整	後 藤 斎	国際協力事業団	農業技術協力課

3. 計画打合せ調査日……………89年3月8日～3月17日

団長・総括	牧 田 道 夫	農林水産省	農業生物資源研究所	遺伝資源管理情報科長
遺伝資源管理	羽 田 丈 夫	農林水産省	農業研究センター	稲育種研究室 主任研究官
研究管理	波 川 鎭 男	農林水産省	技術会議事務局	連絡調整課 遺伝資源管理官
業務調整	後 藤 斎	国際協力事業団	農業開発協力部	農業技術協力課

4. 巡回指導調査日……90年7月17日～7月29日

団長・総括	田中弘敬	農業生物資源研究所遺伝資源第2部長
遺伝資源管理技術	宮崎尚時	農業生物資源研究所植物生殖質保存研究チーム長
研究管理	池田洋一	農林水産技術会議事務局企画調査課課長補佐
業務調整	塩川白良	国際協力事業団農業開発協力部農業技術協力課

5. 巡回指導調査日……91年6月18日～6月30日

団長・総括	奥野員敏	農業生物資源研究所遺伝資源第一部 植物探索導入研究チーム長
遺伝資源管理	三浦清之	北陸農業試験場作物開発部 稲育種研究室研究員
遺伝資源情報管理	梅原正道	農業生物資源研究所遺伝資源第一部 情報システム研究チーム長
業務調整	塩川白良	国際協力事業団農業開発協力部 農業技術協力課

6. 評価調査団……92年11月21日～12月5日

メンバーは前述のとおり

(参考10) 研修・留学生リスト

(1) 日本での研修

年度	研修者	科目	場所	期間
1988	Mr.S.Balendra (R.A)	遺伝資源管理 データベース構築	農業生物資源研究所	1989.3.27 -1989.10.15
1989	Mr.C.B.Hindagara (R.O)	遺伝資源貯蔵管理 利用状況視察	植物遺伝資源関係機関	1989.8.14 -1989.9.10
1989	Ms.K.P.D.Siriwardena (R.O)	遺伝資源評価	農業生物資源研究所	1989.8.14 -1990.2.11
1989	Ms.D.P.Rajapakse (R.O)	IN-VITRO保存 組織培養	農業生物資源研究所	1990.3.12 -1990.9.8
1989	Mr.H.M.S.Wijyaratne (E.O)	遺伝資源の導入 増殖・評価	農業研究センター	1990.3.21 -1990.7.20
1990	Mr.P.V.Hemachandra (E.O)	植物遺伝資源 (グループ・トレーニング)	農業生物資源研究所	1990.5.13 -1990.8.11
1990	Mr.R.R.U.N.Ratnayake (A.F)	遺伝資源の 圃場管理技術	農業研究センター	1990.7.1 -1990.10.28
1990	Ms.S.C.J.Dissanayake (E.O)	データ管理	農業生物資源研究所	1990.12.5 -1991.6.2
1991	Ms.H.J.Warshakoon (R.A)	遺伝資源識別技術	農業生物資源研究所	1991.5.13 -1991.10.10
1991	#Mr.S.P.Dharmawardena (A.O)	遺伝資源圃場 管理技術	農業研究センター	1991.7.18 -1991.12.14
1991	Mr.U.Siriyadasa (R.A)	データ管理	農業生物資源研究所	1991.10.1 -1992.9.30
1991	#Mr.L.A.Weerasena (R.O)	油料種子作物 の改良	千葉県農試 農業生物資源研究所 高知大学	1992.3.10 -1992.10.6
1991	Mr.D.H.Thilakaratne (R.A)	植物遺伝資源の 保存と評価の 機器管理	農業生物資源研究所 野菜茶業試験場 京都大学	1992.3.31 -1992.9.29
1991	#Ms.A.H.Perera (R.O)	植物遺伝資源 (グループ・トレーニング)	農業生物資源研究所	1992.3 -1992.9
1992	#Mr.L.P.Somadasa (R.O)	果樹の育種と保存	果樹試験場	1992.8.31 -1993.3.3
1992	#Mr.H.L.Dayananda (R.O)	野菜の特性評価 と保存	野菜茶業試験場	1992.8.31 -1993.3.3
1992	#Mrs.N.Easwarapadcham (E.O)	野菜の組織培養	種苗管理センター	1992.9.13 -1993.3.10

(2) 第3国での研修

年度	研修者	科目	場所	期間
1990	Mr.A.Hettiarachchi (R.A)	IN-VITRO保存 (第3国研修)	国際稲研究所 (IRRI)	1990.10.28 -1991.4.27

(3) 留学

年度	研修者	科目	場所	期間
1991	Mr.P.K.Samarajeewa (R.O)	学位 (分子生物学)	東京大学応用微生物研 (内宮教授)	1991.10.1
1992	#Ms.S.D.Bandara (R.O)	修士 (植物探索・分類)	京都大学農学部 (阪本寧男教授)	1992.10.7
1993	*#Mr.Y.Ketepearachchi	学位 (耐虫性検定)	神戸大学農学部 (金田忠吉教授)	1993.

注: R.O. Research Officer
 A.O. Agricultural Officer
 E.O. Experimental Officer
 R.A. Research Assistant
 A.F. Agriculture Foreman

*:申請中
 #:地域センター所属

(参考11) プロジェクト期間の主要行事 (1988.8-1992.9)

年月日	主要行事
1988.10.18	植物遺伝資源関係者会議
1989.3.15	農業開発研究省次官とJICA計画打ち合わせ調査団長が暫定実施計画に署名
1989.5.19	Premadasa大統領がPGRC視察
1989.7.20	平井慎介JICA企画部長が農業局長、PGRC所長と協議
1990.4.20	第1回合同委員会開催
1990.5.07	農業局長に1988-89年度ANNUAL REPORT(1988.8-1990.3)提出
1990.5.20	PGRC開所式(大統領、首相、日本大使館、JICAアフリカ事務所長出席)
1990.6.04	PGRCの遺伝資源保存管理様式決定
1990.7.26	農業開発研究省次官と第1回JICA巡回指導調査団長がモロッコに署名
1990.8.30	参議院議員5名がPGRC視察
1990.9.05	Dr. Klaus Lampe(IRRI所長)がPGRC視察
1990.9.19-29	ICRISAT, NBGR, 北京蔬菜研究センター、中国作物品種資源研究所へ技術交換出張
1990.10.19	JICA国別援助研究開発委員会6名がPGRC視察
1990.12.15	JICA玉光弘明理事がPGRC視察
1991.2.18-27	Dr. R. S. Paroda (インド ICAR次長)がPGRC管理について報告
1991.3.06	対外経済協力審議会委員春名和雄(丸紅会長)、吉野丈六(国際経済研究所理事長)がPGRC視察
1991.3.23	対アフリカ経済協力総合調査団(沢木正男団長他)がPGRC視察
1991.4.30	第2回合同委員会開催
1991.5.20	農業局長に1990年度ANNUAL REPORT(1990.4-1991.3)提出
1991.6.27	農業局長に第2回JICA巡回指導調査団長が団長レター提出
1991.7.01	遺伝資源管理運営委員会(PGRC)で部門間ネットワーク形成を検討
1991.7.10	外務省経済協力局橋本宏審議官がPGRC視察
1991.8.14	PGRC所長がDr. G. JayawardenaからDr. P. Ganashanに代わる
1991.8.22	Dr. John L. Nickel(CIAT所長)がPGRC視察
1991.10.24	JICA真木秀郎副総裁がPGRC視察
1991.11.15	ジョージタウン農工大学チーム(3名)がPGRCを訪れ技術交換
1992.1.24	Dr. Y. L. Nene(ICRISAT次長)がPGRC視察
1992.2.19	Dr. James H. Thomas (アメリカ農業極東地域研究所長)がPGRCでアフリカ-アメリカ協力プロジェクト打ち合わせ
1992.3.23	JICA田口俊郎理事、清水武男課長が農業局長と協議
1992.5.04	Research Programme Discussion - Maha 1992/93 & Yala 1993
1992.5.08	JICA 中島公明理事PGRC視察
1992.5.08	Michael T. Jackson(IRRI遺伝資源センター長)がPGRC視察
1992.5.20	第3回合同委員会開催
1992.6.12	Workshop on Application of Biotechnology in Agriculture Development
1992.7.17	農業局長に1991年度ANNUAL REPORT(1991.4-1992.3)提出
1992.7.23	JICAアフリカ事務所長と専門家チームが5カ年計画後について協議
1992.7.29	「暫定実施計画(TSI)の進捗状況と残される課題」報告をJICA農業開発協力部長に提出
1992.9.7	Meeting on PGRC programme
1992.9.16	PGRCミーティング開催
1992.9.18	JICAアフリカ事務所長に専門家チームがPGRCの現状を報告し協議

(参考12)

VEGETATIVE PROPAGATED PLANT
IN REGIONAL AGRICULTURAL RESEARCH CENTRE

Nov. 1992

NAME OF RARC	NAME OF CROP	NO. OF CULTIVAR
Angunakolapelessa	Banana	3
	Grape	17
Bandarawela	Pineapple	3
	Potato	72
Bibile	Banana	5
	Pineapple	3
Bombuwela	Banana	15
Gannoruwa	Banana	17
	Cassava	84
	Cocoyam	19
	Dioscorea	17
	Innala	2
	Pineapple	11
	Sweet potato	108
Girandurukotte	Mango	26
Maha Iluppallama	Banana	12
	Grape	30
	Lemonine	1
	Mango	53
	Small onion	1
	Sweet orange	3
Mutukandiya	Banana	3
8 RARC	13 CROPS	TOTAL 505

PLANT CODE	PLANT NAME	SCIENTIFIC NAME
00001	GROUP UNKNOWN	UNKNOWN
01000	Wild rice- Unidentified	Oryza sp.
01001	Rice	Oryza sativa L.
01002	African cultivated rice	Oryza glaberrima Steud.
01003	wild rice	Oryza nivara Sharma & Shastri
01004	Wild rice	Oryza rufipogon W. Griffith
01005	Wild rice	Oryza eichingeri A. Peter
02000	Cereal- Unidentified	Non rice cereal
02001	Maize	Zea.mays L.
02002	Sorghum	Sorghum bicolor (L.) Moench
02003	Finger millet	Eleusine coracana (L.) Gaertn.
02004	Fonthead millet	Setaria italica (L.) Beauv.
02005	Pigeon millet	Panicum miliaceum L.
02006	Little millet	Panicum sumatrense Roth ex Roem. & Schult.
02007	Kodo millet	Paspalum scrobiculatum L.
02008	Pearl millet	Pennisetum americanum (L.) Leeke
02009	Japanese millet	Echinochloa frumentacea Link
03000	Grain legume- Unidentified	Grain legume - Unidentified
03001	Cowpea	Vigna unguiculata (L.) Walp.
03002	Green gram	Vigna radiata (L.) Wilczek
03003	Black gram	Vigna mungo (L.) Hepper
03004	soya bean	Glycine max (L.) Merr.
03005	Groundnut	Arachis hypogaea L.

LIST OF CROP SPECIES in PGRC Passport data table

DATE : 1992/11/27

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PLANT CODE	PLANT NAME	SCIENTIFIC NAME
03006	Horse gram	Macrotyloma uniflorum (Lam.) Verdcourt
03007	Lentil	Lens culinaris Medikus
03008	Chick pea	Cicer arietinum L.
03009	Pigeon Pea	Cajanus cajan (L.) Hutch
03010	Pea	Pisum sativum L.
03011	Velvet bean	Mucuna pruriens (L.) DC.
03012	Lima bean	Phaseolus lunatus L.
03013	Rice bean	Vigna umbellata (Thunb.) Ohwi & Ohashi
03014	Cluster bean	Cyamopsis tetragonolobus (L.) Taub.
03015	Atylosia-Unidentified	Atylosia sp.
03016	Atylosia	Atylosia albicans (Wight & Arn.) Benth.
03017	Atylosia	Atylosia rugosa Wight & Arn.
03018	Atylosia	Atylosia scarabaeoides (L.) Benth.
04000	Vegetable legumes - Unidentified	Vegetable legumes - Unidentified spp.
04001	Common bean	Phaseolus vulgaris L.
04002	Yard long bean	Vigna unguiculata (L.) Walp.
04003	Winged bean	Psophocarpus tetragonolobus (L.) DC.
04004	Jack bean	Canavalia ensiformis (L.) DC.
04005	Sword bean	Canavalia gladiata (Jacq.) DC.
04006	Hyacinth bean	Lablab purpureus (L.) Sweet
04007	Yam bean	Pachyrhizus erosus (L.) Urban
05000	Solanaceous vegetables - Unidentified	Solanaceous vegetables - related spp.

LIST OF CROP SPECIES :in PGR Passpport data table

DATE : 1992/11/27

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PLANT CODE	PLANT NAME	SCIENTIFIC NAME
05001	Unidentified Solanum sp.	Solanum sp.
05002	Brinjal	Solanum melongena L.
05003	Ela batu	Solanum melongena L.
05004	Tomato	Lycopersicon esculentum Mill.
05005	Capsicum	Capsicum annuum L.
05006	Capsicum	Capsicum frutescens L.
05007	Capsicum-Unidentified	Capsicum sp.
05008	Anas batu	Solanum macrocarpon L.
05009	Gona batu	Solanum torvum Sw.
05010	Tibbatu	Solanum violaceum Ortega
05012	Capsicum sp.	Capsicum baccatum L. var. baccatum
05013	Capsicum sp.	Capsicum baccatum var. pendulum (Willd.) Esbaugh
05014	Capsicum sp.	Capsicum pubescens Ruiz. & Pavon
05015	Capsicum sp.	Capsicum chinense Jacq.
05017	Kalukanweriya	Solanum americanum Mill.
05018	Del batu	Solanum capsicoides All.
06000	Cucurbit vegetable - Unidentified	Cucurbit vegetable - Unidentified
06001	Pumpkin	Cucurbita moschata (Duchesne) Poir.
06002	Pumpkin	Cucurbita maxima Duchesne
06003	Cucurbita sp.-Unidentified	Cucurbita sp.
06004	Cucumber	Cucumis sativus L.
06005	Cucumis sp.	Cucumis sp.
06006	Snake gourd	Trichosanthes cucumerina L.

LIST OF CROP SPECIES :in PGRC Passport data table

DATE : 1992/11/27

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PLANT CODE	PLANT NAME	SCIENTIFIC NAME
06007	Luffa sp.	Luffa sp.
06008	Angled luffa	Luffa acutangula (L.) Roxb.
06009	Ash pumpkin	Benincasa hispida (Thumb.) Cogn.
06010	Bitter gourd	Momordica charantia L.
06011	Bottle gourd	Lagenaria siceraria (Molina) Standl.
06012	Smooth luffa	Luffa aegyptiaca Miller
06013	Cho cho	Sechium edule (Jacq.) Sw.
06014	Coccinia sp.	Coccinia cordifolia Cogn.
06015	Momordica sp.	Momordica dioica Roxb. ex Willd
06016	Kekiri	Cucumis melo L.
07001	Cabbage	Brassica oleracea L. Capitata Group
07004	Chinese cabbage	Brassica rapa L. Chinensis Group
08000	Alliums - Unidentified	Allium sp.
08002	Bombay onion	Allium cepa Ceba L. Group
08003	Red onion	Allium cepa L. Aggregatum Group
09000	Other vegetables-Unidentified	Unidentified sp.
09001	Okra	Abelmoschus esculentus (L.) Moench
09006	Moon flower	Ipomoea alba L.
09007	Abelmoschus	Abelmoschus angulosus Wall. ex Wight & Arn.
09021	Beet root	Beta vulgaris L.
10000	Leafy vegetable-	Unidentified
10001	Amaranthus	Amaranthus sp.

LIST OF CROP SPECIES :in PGRC Passport data table

DATE : 1993/11/27

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PLANT CODE	PLANT NAME	SCIENTIFIC NAME
10003	Amaranthus	Amaranthus hybridus ssp. cruentus(L.)Thellung
10004	Amaranthus	Amaranthus dubius Mart.
10006	Amaranthus	Amaranthus hybridus L.
10007	Amaranthus	Amaranthus lividus L.
10009	Amaranthus	Amaranthus tricolor L.
10020	Ceylon spinach	Besella alba L.
10026	Gas niviti	Talinum triangulare (Jacq.) Willd.
10027	Kiri henda	Celosia argentea L.
11000	Root & tuber-Unidentified	Root & tuber-Unidentified
11003	Potato	Solanum tuberosum L.
11006	Yam	Dioscorea alata L.
11008	Yam	Dioscorea bulbifera L.
11041	Butsarana	Canna indica L.
12000	Brassica sp.	Brassica sp.
12001	Mustard	Brassica juncea (L.) Czerniak
12004	Mustard (Europe)	Sinapis alba L.
13000	Oil seed crop-Unidentified	Unidentified
13001	Sesame	Sesamum indicum L.
13002	Wild Sesame-Unidentified	Sesamum sp.
13004	Sun flower	Helianthus annuus L.
14000	Fruits -unidentified sp.	Unidentified sp.
14001	Water melon	Citrullus lanatus (Thunb.) Matsum. & Nakai
14002	Melon	Cucumis melo L.

LIST OF CROP SPECIES :in PGRC Passport data table

DATE : 1992/11/27

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PLANT CODE	PLANT NAME	SCIENTIFIC NAME
14040	Papaw	Carica papaya L.
15002	Cotton	Gossypium sp.
16001	Centrosema-Unidentified	Centrosema sp.
17000	Medicinal plant	UNKNOWN-Medicinal plant
17001	Asamodagam	Trachyspermum roxburghianum(DC.) Craib
17002	Katu wel batu	Solanum virginianum L.
17003	Amukkara	Withania somnifera(L.) Dunal
17004	Petitora	Cassia tora L.
17005	Penitora	Cassia occidentalis L.
17006	Kala wel	Derris scandens Benth.
17007	Crotalaria sp.	Crotalaria sp.
17008	Indi	Phoenix zeylanica Trimen
17009	Kata rodu	Clitoria ternatea L.
17010	Hondala	Adenia palmata(Lam.) Engler
17011	Alang	Alpinia nigra(Gaertn.) Burtt
18001	Chenopodium	Chenopodium quinoa willd

129 plants

(参考14) PGRC Passport data

(1)Accession no	000004	(2)Accession date	1989/04/04
(3)Plant code	02002		
Plant name	Sorghum		
Scientific name	Sorghum bicolor (L.) Moench		
(4)Cultivar name	IDAL IRINGU		
(5)Alias name			
<hr/>			
(6)Status	3	Landrace	
(7)Source	1	Collect	
(8)Origin code	070	Anuradhapura	
(9)Source year	1987		
(10)Introduction country code			
(11)Introduction year			
(12)Former NO			
(13)Organization code	000	Plant Genetic Resources Centre	
(14)Remark	n		

02001 Zea mays L.

Maize

ACCE NO	CULTIVAR NAME/LOCAL NAME	ORIGIN
001870	-	Philippines
001871	-	Philippines
002145	ACROSS 7421-39-2-*B-##	Mexico
005228	ACROSS 7543-4-2	unknown
002161	ACROSS 7543-9-1-*B-##	Mexico
002158	ACROSS 7632-12-3-*B-##	Mexico
002162	ACROSS 7643-17-1-*B-##	Mexico
002163	ACROSS 7643-20-2-*B-##	Mexico
001868	ACROSS 7843	Mexico
002164	ACROSS 7843-16-1-*B-##	Mexico
002157	ACROSS 7929-38-1-*B-##	Mexico
001876	ACROSS 8043	Mexico
002173	ACROSS 8078-2-4-*B-##	Mexico
001869	ACROSS 8140	Mexico
002630	AUST 25	Thailand
002143	BABY CORN	Thailand
005236	BABY CORN	Thailand
000022	BADA IRINGU	Anuradhapura
000033	BADA IRINGU	Anuradhapura
000090	BADA IRINGU	Monaragala
000145	BADA IRINGU	Hambantota
000153	BADA IRINGU	Hambantota
000157	BADA IRINGU	Hambantota
000166	BADA IRINGU	Hambantota
000173	BADA IRINGU	Hambantota
000178	BADA IRINGU	Hambantota
000195	BADA IRINGU	Hambantota
000228	BADA IRINGU	Monaragala
000245	BADA IRINGU	Hambantota
000256	BADA IRINGU	Hambantota
000261	BADA IRINGU	Hambantota
000266	BADA IRINGU	Hambantota
000267	BADA IRINGU	Hambantota
000308	BADA IRINGU	Matale
000348	BADA IRINGU	Matale
000356	BADA IRINGU	Matale
000358	BADA IRINGU	Matale
000387	BADA IRINGU	Kurunegala
000367	BADA IRINGU	Matale
000410	BADA IRINGU	Kurunegala

02001 Zea mays L.

Maize

ACCE NO	CULTIVAR NAME/LOCAL NAME	ORIGIN
000475	BADA IRINGU	Nuwaraeliya
000563	BADA IRINGU	Nuwaraeliya
000573	BADA IRINGU	Nuwaraeliya
000600	BADA IRINGU	Nuwaraeliya
000709	BADA IRINGU	Nuwaraeliya
000714	BADA IRINGU	Nuwaraeliya
000782	BADA IRINGU	Matale
001247	BADA IRINGU	Matale
001411	BADA IRINGU	Badulla
001548	BADA IRINGU	Nuwaraeliya
002725	BADA IRINGU	Thailand
002740	BADA IRINGU	Matale
001336	BADA IRINGU	Ratnapura
001339	BADA IRINGU	Ratnapura
001340	BADA IRINGU	Badulla
001348	BADA IRINGU	Badulla
001861	BADA IRINGU	Anuradhapura
001862	BADA IRINGU	Anuradhapura
001866	BADA IRINGU	unknown
001867	BADA IRINGU	Mexico
002947	BADA IRINGU	Monaragala
002950	BADA IRINGU	Monaragala
002954	BADA IRINGU	Monaragala
003013	BADA IRINGU	Hambantota
003044	BADA IRINGU	Hambantota
005035	BADA IRINGU	Polonnaruwa
005040	BADA IRINGU	Polonnaruwa
005057	BADA IRINGU	Anuradhapura
005058	BADA IRINGU	Anuradhapura
005060	BADA IRINGU	Anuradhapura
005063	BADA IRINGU	Anuradhapura
005064	BADA IRINGU	Anuradhapura
005065	BADA IRINGU	Anuradhapura
005066	BADA IRINGU	Anuradhapura
905078	BADA IRINGU	Polonnaruwa
005079	BADA IRINGU	Polonnaruwa
005166	BADA IRINGU	Badulla
005167	BADA IRINGU	Badulla
005169	BADA IRINGU	Badulla
005170	BADA IRINGU	Badulla
005171	BADA IRINGU	Badulla
005173	BADA IRINGU	Badulla
005174	BADA IRINGU	Badulla
005175	BADA IRINGU	Badulla
005176	BADA IRINGU	Badulla
005235	BADA IRINGU	Polonnaruwa

02001 Zea mays L.

Maize

ACCE NO	CULTIVAR NAME/LOCAL NAME	ORIGIN
005366	BADA IRINGU	unknown
000335	BADA IRINGU (RATHU)	Matale
000321	BADAIRINGU	Matale
000378	BADAIRINGU	Kurunegala
000427	BADAIRINGU	Kurunegala
000443	BADAIRINGU	Kurunegala
000487	BADAIRINGU	Nuwaraeliya
000492	BADAIRINGU	Nuwaraeliya
000507	BADAIRINGU	Nuwaraeliya
000551	BADAIRINGU	Nuwaraeliya
000949	BADAIRINGU	Nuwaraeliya
000952	BADAIRINGU	Hambantota
000953	BADAIRINGU	Hambantota
001202	BADAIRINGU	Anuradhapura
001208	BADAIRINGU	Anuradhapura
001456	BADAIRINGU	Nuwaraeliya
001762	BADAIRINGU	Anuradhapura
001763	BADAIRINGU	Anuradhapura
001764	BADAIRINGU	Anuradhapura
001765	BADAIRINGU	Anuradhapura
001767	BADAIRINGU	Anuradhapura
001811	BADAIRINGU	Kandy
001812	BADAIRINGU	Kandy
001813	BADAIRINGU	Kandy
001848	BADAIRINGU	Kandy
001858	BHADRA-1	Anuradhapura
006020	BUENO	Italy
002381	C-2	unknown
001863	CALI YELLOW X LA POSTA	Thailand
002638	CARMEN SWEET	Thailand
001855	CETTAR	Philippines
002632	CM 104	Thailand
001860	COMP.2 WHITE	Anuradhapura
001859	COMP.6 WHITE	Anuradhapura
006017	DS 456K (WHITE)	Australia
001873	EARLY DMR COMP 1	Philippines
002631	ETO 182	Thailand
002612	EW-DMR POOL-C4-S2 BULK	Thailand
002608	EW-DMR POOL-C5-HS BULK	Thailand
002613	EY-DMR POOL-C3-S2 BULK	Thailand
002609	EY-DMR POOL-C4-HS BULK	Thailand
002633	GREAT TIME	Thailand