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GR/CIDS PROJECT DRAFT REPORT
TO
THE INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES
AND

THE FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS (AGPE)

May 21-23, 1975

ROME, ITALY

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FAO CONTRACT RF/HQ/1974-1/AGP
FOR SERVICES IN CONNECTION WITH ITS REGULAR PROGRAM

FAO CONTRACT TF/HQ 1974-1/AGP
FOR SERVICES IN CONNECTION WITH
THE INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES PROJECT

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OVERVIEW

It is crucial for extensive contacts to be made with all areas of the genetic resources field. Active cooperation and involvement from these areas is of the utmost importance. Significant working contacts have been initiated with scientists and administrators in the genetic resources community across all functional and crop aspects. Important crop data is being received continuously on maize, wheat (small grains), rice, peanuts, potatoes, sorghum, beans, cowpeas, and cassava. Participation and sponsorship of workshops, seminars, and conferences has provided another means of initiating significant contacts. These contacts have often been the stimulus for invitations to continue discussions for the development of projects through site visits.

Without exception every individual contacted has endorsed the approach specified in the design of the GR/CIDS concept.

GR/CIDS PROGRAM OBJECTIVES

The stated objectives of the GR/CIDS project are:

1. To investigate and define the current operational genetic resources communication, information, documentation system (GR/CIDS).
2. To update the current system to make it more effective.
3. To link these goals to the overall promotion of an international network of genetic resources activities.

GR/CIDS PROGRAM STRATEGIES

The GR/CIDS program is developed through four strategies. Each is applied within the five functional areas of genetic resources (exploration/ collection; maintenance; evaluation; improvement; utilization) in close cooperation with members of participating centers' staff and on real data.

These strategies are:

1. To work with individuals and groups at the various operational centers.
2. To utilize the currently available and immediately transferable technology on real problems.
3. To develop project sets that are crop specific.
4. To apply computerized methods to the GR/CIDS activities of the centers.

In applying these strategies we are utilizing the feedback gained from the description of the current GR/CIDS systems. This feedback is important for insuring that the direction taken will reflect the requirements of the genetic resources functions of the network.

In our present activities we have been investigating the currently operational GR/CIDS. This investigation is implemented through systems analysis, systems development, and transfer. Our emphasis has been to implement the systems analysis on real problems where the problems have to be solved.

To investigate the data requirements of the GR/CIDS we are forging a computerized information storage and retrieval system to accommodate the voluminous data that describe plant genetic resources. Development of computer based assistance will expedite the international network for the exchange of data between individuals and centers on a global basis. The primary entry points into the GR/CIDS are individuals or groups at the various operational centers. It is necessary to work with them first on a specified problem set within a specific crop to fully understand their concerns and fears.

In working on these real problems, care is taken to proceed to other more general problem areas. These problems and design solutions are to be linked to other genetic resources personnel with similar problems in a specific center and among centers. This begins to define a real network. The effort must be fully cooperative, i.e., respecting and giving credit to the ideas and solutions generated by each individual working on the problems within the network.

The work of coordinating, planning, and executing must be flexible and systematic to focus on the problems which actually block the continued improvement and effectiveness of the GR/CIDS. Future demands that will be placed on the system must be examined and considered to assist in design and development of a system that can be effective and responsive in the future.

GR/CIDS ACTIVITIES

In presenting our overall mission and specific points of strategy for accomplishing this mission to genetic resources related personnel to date, we have asked for criticism and recommendations. From these we have revised certain points, but in general the operating strategies have been approved and reinforced by these contacts. To carry out these strategies, we have

organized our activities in three categories:

1. Network Development
2. Data/Germplasm Materials Operations
3. Computer Based Assistance.

Workshops and conferences within these activities have not only provided a means for dissemination of information and generation of responses about the GR/CIDS project but have often led to follow-up invitations to visit specific centers and personnel. All our contacts had the similar purpose of presenting the GR/CIDS concept including objectives, strategies and activities for comment and criticism. Cooperation was sought from the contacts so that they would participate with us jointly.

Selected site visits have been made to numerous centers. Table I summarizes the visits to date. (See Appendix)

We have already held two workshops in Boulder dealing with the specific crop related functions of maize and wheat. The workshops differed in the specific accords and projects derived from them. The maize group determined and defined accords for continued work center by center. The initial responsibility of finding a common project concept was left to the GR/CIDS team. The wheat workshop assisted in presenting critical ideas and recommendations for the Leningrad conference and implementing certain project concepts. Specific details of these workshops can be found in the appendices attached to this report.

Using participatory techniques, we have formed operating committees allowing working scientists to plan and help execute portions of our work program. These committees are currently organized within each activity category providing communication channels for information flow, direction on standards and measurements and exchange of information in computer and quantitative techniques.

We have also formed project sets to detail the definition of GR/CIDS for specific crops and over several centers. These project sets are serving:

1. To develop a description of the functions and activities of the network for persons working with specific crops. This description will lead to the improvement of communication and exchange of data and material in the specific crop network.
2. To determine the amount, kind and quality of information that currently exists in germplasm collections.
3. To determine the types of germplasm and environmental data utilized and the standards required in measurement of these data for the functions of genetic resources work, including exploration/collection, maintenance, evaluation, improvement and utilization.
4. To re-evaluate existing germplasm material in order to update the data on the germplasm collection. Then computer assisted methods can be used to reorganize such data.
5. To improve the availability of information on germplasm collections within the network by examining methods to make information more accessible.

A major part of our work concerns the investigation and application of computer assisted methods as they apply to genetic resources work. The application of computer programs is to assist in the organization, evaluation and accession of the data banks on genetic resources.

Our design philosophy is to place the burden on the effective use of the computer. This differs from demanding highly specialized programming skills from the user. We are installing computerized information, storage and retrieval programs (EXIR) at locations for use by national and international centers. We are making this program functional on minicomputers as well. These programs are then being linked to such analysis programs as SAS, SPSS, and BMD. Information on the quantitative techniques applied at various centers is being evaluated and exchanged. Further, we are also seeking assistance from multinational firms in software and hardware design.

NETWORK DEVELOPMENT

The objective of the IBPGR is to promote an international network of plant genetic resources. In conjunction with this objective we are investigating the current informal GR/CIDS network in order to define and better understand it for the purpose of making it more effective. One of the first steps necessary in this investigation has been to understand the data and information problems that currently exist in view of the organizational structure of genetic resources work. In this respect we are seeking to identify the structure, utilizing real data problems as the foundation of our work.

In analyzing the current network we have looked for assistance from operating members of the various centers. This has been accomplished through selected site visits and workshops. The following is a brief account of the centers visited or contacted with specific regard to network development.

1. CIMMYT.

Three site visits to CIMMYT have taken place. There have been visits by five CIMMYT staff members to Boulder. These site visits have contributed to the network development by identifying the problems associated with genetic resources data and by identifying the problems of organization of data flow for transmission and exchange purposes between CIMMYT and other national and regional centers.

2. IRRI

An initial visit has been made to IRRI to investigate their well regarded informal communication network on rice, and their interests in CIDS functions for their Genetics, Evaluation and Utilization Program.

3. IITA

We are visiting IITA in June to discuss their role in network development.

4. Bogor, Indonesia

We attended a symposium concerning the establishment of a regional center for Southeast Asian genetic resources. From this meeting we were able to make valuable contacts and gain information on their regional problems and activities.

5. Turrialba

We have had very preliminary discussions with Dr. Seidewitz of FAL/West Germany concerning joint assistance in developing the GR/CIDS system for Turrialba and the development of an area wide CIDS training center there.

6. PCIM/Peru

The PCIM visit was scheduled in conjunction with the team visit to CIP. PCIM is working on a Latin American maize communication network. We have been asked to participate with them in this project.

7. EMBRAPA/Brasil

EMBRAPA sent two staff members to Colorado for the maize workshop, the chief of Systems Development and the Chief of Genetic Resources coordination. EMBRAPA is a newly formed organization. It has been given the task of coordinating all national agricultural research work. It is coordinating the data at each Brazilian center on their germplasm material and then will create a central collection for a Brazilian network. This effort represents a microcosm of the global network in maize and other crops as well. They are willing to coordinate their efforts with non-Brazilian centers.

The workshops held in Boulder on maize and wheat were the beginning of joint efforts between scientists from international, regional and national centers. Information was gained on the critical problems of motivating the operating scientists at every genetic resource function to use the data and genetic resource banks effectively. It was determined that blockages must be

understood and the data/germplasm bank system must be made responsive to the reasons for blockage.

Another workshop on peanut genetic resources will be held in Florida in July. We will participate in this workshop for contacts and to begin the development of a network on peanut genetic resources data activities.

We also plan to attend the international maize conference in Illinois in September for purposes relating to network development.

A working group committee of operating scientists emerged from the workshops held in Boulder. This group is assisting in the investigation of the methods to establish networks of communication and exchange for wheat and maize germplasm. This includes an analysis of communication and exchange and the pressures placed on the network to meet the changing demands from genetic resources workers across all genetic resources functions.

Specific center based projects are being designed to fit into larger multi-center project sets. Such project sets are crop related and in some instances, also regional. Each project set, based on the crop, involves some aspect of network development and must somehow interface with the CGIAR centers having a crop 'responsibility'. Currently the following centers are participating in various stages of this work. For maize these are CIMMYT, ICA, PCIM, EMBRAPA, and INIA. For wheat they are: CIMMYT, INIA, FAL, USDA, UK/ARC. We are also engaged in preliminary project work in Passo Fundo, Brasil, to investigate the wheat network of the southern cone region in South America.

We are employing computer methods for developing data banks of individuals and institutions so that crop genetic resources may be safely maintained. A computerized contact file listing names of personnel, institutions, countries, and crop collections which have emanated from our

work has been created and is continually updated. Further, the questionnaire files on genetic resources received from the FAO/AGPE have been computerized.

DATA/GERMLASM MATERIALS OPERATIONS

Individuals and centers are providing us with actual data as they exist and are currently used. The data and the information about how they are used or are not used, in conjunction with germplasm materials operations and the desires of the personnel at the centers, are incorporated in analyses of the data system. This allows for the development and installation of the best method of a CIDS at a specific center. Through the data and related information we can demonstrate how centers communicate to strengthen their operations in-house and with other centers.

For those centers not having access to computers, and for preliminary organization of data banks for those that have suitable equipment available, we have established a Data Service Bureau. The data we are presently working with are listed in Table 2 (see Appendix). We have been assembling, processing and analyzing these data - in some cases putting it into machine readable format, in most cases answering queries regarding content and quality of characteristics, and in others providing more sophisticated analyses through computerized multivariate techniques.

These data have come from the various contacts we have made with center personnel. The Data Service Bureau activities are being carried on for the centers listed below. Centers where the data was initially gathered via a site visit are pointed out.

1. IITA.

A report/catalog on the IITA cowpea collection is being completed. A staff member of IITA has been asked to join us in our work with the specific approval of IITA.

2. IRRI

Sample sets of IRRI germplasm data are being sent to us for analysis. Agreements to send this data were worked out during the site visit by Dr. Rogers in March, 1975.

3. ICRISAT

The chickpea collection data are being sent to us for processing this summer. Agreements regarding this data were made with ICRISAT by Dr. Rogers during a site visit in March, 1975.

4. CIAT

The bean germplasm bank is presently a working bank and CIAT is sending data corrections which will allow further analysis to be performed on the corrected data. A site visit in April, 1975 facilitated the agreement regarding the corrected data. We also have a sample of their cassava data.

5. CIMMYT

CIMMYT has sent data on the maize germplasm collection, the wheat nursery trials and the maize progeny testing. All of these files have been sent for the purpose of data format and content analysis. Site visits in January and again in March accelerated the work programs regarding this data.

6. CIP

Data from the collector's records is currently being put into working banks. The site visit in March, 1975 resulted in the agreement to begin work on the germplasm collection data by starting with the collectors records.

7. Aegean Center/Izmir, Turkey

The initial data sets of about 3,000 collections have been processed. The data was sent to us as a result of a 1974 site visit.

8. EUCARPIA

Contacts through the workshops with Drs. Gunn and Brandolini have led to our receiving data on the northern maize committee progeny tests and the southern maize committee germplasm collection records by national center.

9. EMBRAPA

a. Brasília. We have processed a pilot data set on the maize germplasm collections.

b. Centro Nacional de Pesquisa de Trigo/Passo Fundo. The breeders' data on wheat was brought back from a March 1975 site visit and has been processed in Boulder. Results of the processing will be used at the Leningrad Symposium in July.

10. FAO

We have received AGP data through Dr. Brandolini, advanced genetic resources lines of Latin American Maize through 1972 and preliminary germplasm data on Southern Mediterranean collections of maize (Italy, Rumania, Spain, Bulgaria, Greece).

We have also received AGPE data through Mr. Pichel. This includes: questionnaire file on genetic resources in global collection, 1969-1970; questionnaire file on genetic resources contact for global network, 1969-1970; the mailing list of the Plant Genetic Resource Bulletin; and agroclimatological measurements at specific stations in Latin America, preliminary data.

11. USDA/NSSL

We have from the NSSL a full data set of the storage records for their complete germplasm collection which has 95,000 accessions. They have further provided us with complete machine readable data sets on their wheat germplasm collection, barley germplasm collections and bean germplasm collection.

12. UK/ARC

Site visits at FBI and Reading have resulted in our processing data on their wheat germplasm collection.

13. INIA

Preliminary data sets have been supplied on the maize collections and extension information on wheat will arrive soon.

14. ICA

We have received from ICA a data set on maize germplasm in machine readable format covering 4,000 collections and using 30 descriptors.

15. PCIM

We have the entire maize data set in machine readable format of some 6,500 collections using 60 descriptors.

From the workshops attended and those held in Boulder we initiated much of the direction for the work on data banks. We established working groups on data/germplasm materials operations and began formalizations of several project sets.

The committees on data/germplasm materials operations are focusing on the development of observation/measurement standards for descriptors.

Accords were reached on recommended descriptor reporting standards and data formats. These are summarized in the report on the wheat workshop in the attached appendix. Through the committees, a minimum set of descriptors is beginning to be established, including a minimum set of descriptor definition standards. These are that each center can, if they wish, choose their own well defined and clearly understood descriptor standards. Indications are that blanket international standards are not entirely useful. To be useful, the standards must serve collective groups that work together. For certain tasks, the committees are beginning to work together and eventually all are expected to encompass the entire genetic resources community.

Project sets are also serving to guide our efforts in Data/Germplasm Materials Operations. The portions of these sets which relate to specific data problems are summarized under the related centers as follows:

1. CIMMYT (Centro Internacional de Mejoramiento de Maiz & Trigo)

We are working with CIMMYT on the maize germplasm banks emphasizing the development of a complete data bank through a cataloging project now underway. We have been directing Dr. Robert Bird of CIMMYT to complete a selection and integration of data banks about the CIMMYT Maize germplasm bank from a number of sources. One data bank pertains to inventory control; another to the catalog of population standards.

2. CIP (International Potato Center)

The breeding program at CIP is working with the GR/CIDS team on the computerization of data regarding disease resistance and the morphological characteristics on the germplasm collections, especially with regard to the use of organization techniques that would allow for classification of the items into species.

3. FAL (Institut Pflanzenbau FAL - West Germany)

Dr. Lothar Seidewitz, who spent several weeks in Colorado in early 1975, is working with members of the GR/CIDS team on certain aspects of descriptor standards which have a great deal of bearing on the data bank organization of specific crops.

4. ICA (Instituto Colombiano Agropecuario)

From existing records, current efforts are developing a complete valid data set regarding the maize germplasm collection at ICA. Data bank organization techniques are being investigated as they might apply to specific data at ICA that will be gathered through future evaluation of certain collections in the germplasm bank.

5. INIA (Instituto Nacional de Investigaciones Agrícolas)

The INIA effort is important since it involves a different type of problem that may arise in our future relations with other centers.

INIA in Mexico has a very important collection of maize. Portions of the collection are in the CIMMYT collection. It represents an integral part of the overall maize diversity. The INIA collection is documented in a number of journals. None are machine readable. Further, there is some resistance to participate. The stated concern is that INIA will not be credited for their collections and will lose control over their collections if they enter their data in a network. These concerns probably express only a portion of the latent concerns. The INIA concerns (fears) of entering data and material into some international collection is being solved. We are working on the INIA collections to provide them with assistance in publishing catalogs and giving them credit for their own collections.

Computerized techniques are being employed in most cases in the areas of our participation in Data Germplasm Operations. All of our data banks on germplasm materials are being processed by EXIR at Colorado. The DANE in Colombia is testing the installation used jointly by CIAT and ICA.

It has become evident from our work on data banks that there is interest from several centers in various sophisticated computerized techniques for searching their collections for information. In fact, some of the more developed international agricultural centers such as CIAT and IITA are making specific requests for assistance to use these techniques for groupings, patterns, similarities, and diversities.

To respond to these requests we have begun an experimental evaluation effort on a set of computerized multivariate classification programs which

are applicable to the difficult data searching problems encountered in evaluations of germplasm bank data. Examples of the types of questions to be answered through this effort are:

Does the particular revealed structure of the data set add anything to our comprehension of the collection?

Is it absurd or is further investigation called for?

Should some other computerized technique be tried on the data set?

In pursuing this effort, the staff of the GR/CIDS team is working cooperatively with University of Colorado personnel such as staff members and graduate students. One preliminary example of our work concerns the Vigna unguiculata (cowpeas) collection data received from IITA. Using the clustering programs of CHARANAL and GRAPH to determine genetic diversity of the species, an initial result (see computer-printed charts in the appendices) seems to indicate that there are two major groupings of morphological similarity within the species complex. Two separate analyses using these programs indicate correlations between certain morphological characters and disease resistance.

COMPUTER BASED ASSISTANCE

In most instances the computer is becoming a necessity in genetic resources work. The limiting factors often are inaccessibility to adequate computer equipment and to adequate software and problem solving programs. It is our intention to assist in solving these problems by making information available with the aid of computerized techniques. Examples of the types of computer based assistance being employed in genetic resources functions are illustrated in Table 3. The programs are being implemented on both large scale computers and minicomputers.

Specifically, we are transferring those computer programs such as EXIR and others to provide useful tools in specific genetic resources functions. In fact, the first two installations of EXIR onto available computer equipment have been accomplished at Mexico and Colombia. With respect to the minicomputer, we will make our expertise available for systems installations for genetic resources work.

We are presently carrying on discussions with several centers regarding implementation of computer based assistance at those centers. These centers are listed below:

1. CIAT (Centro Internacional de Agricultura Tropical)

A site visit in April, 1975, and Dr. Franklin's participation in the Maize Workshop, facilitated the beginning of discussions regarding joint work on computerized multivariate classification methods. Application of these analyses is being carried out on the bean germplasm collection at CIAT.

2. IRRI (International Rice Research Institute)

Prior to our recently completed visit to IRRI, we were in touch with Dr. MacKenzie of Pennsylvania State University, a consultant to IRRI on progeny testing. Dr. MacKenzie discussed with us his recommendations on IRRI computer hardware and software needs. We have been asked to review his recommendations for meeting these needs for possible implementation.

3. CIP (The International Potato Center)

The primary needs at CIP are for computer assisted methods for management and maintenance of the germplasm and herbarium data information. Two primary concerns are (a) evaluation of germplasm diversity in the collection for immediate use (screening and cross selection) and planning for obtaining new material through exchange or exploration and (b) the use of computer assisted methods to accumulate and effectively display information

at the decision points in the field. The availability of computing equipment is limited however. For this reason there is a great interest in minicomputers and in linking up with a large machine through an on-line terminal.

4. PCIM/Peru (Programa Cooperativo de Investigaciones en Maiz)

The PCIM visit was scheduled in conjunction with the team visit to CIP in March of 1975. The specific PCIM project concern at the moment is the lack of adequate computing facilities. There is a potential for a joint relationship between PCIM and CIP in the use of a large scale computer or a minicomputer. We are exploring this situation with IBM and the minicomputer companies.

External contacts are being made with a number of sources for assistance with our computer methods. IBM is apparently willing to make a major contribution through their science centers and through their systems experts. They may be willing to assign development personnel to work with us. The personnel who have been assigned to us by IBM to date are being used to assure that the programs already available such as EXIR will be compatible and transferable to IBM equipment. It is probable that IBM will be the equipment currently available in most areas of the world. For that reason the IBM personnel currently working with us have also been making sure that the programs will maximize the use of IBM hardware and systems design.

In working to make the EXIR programs operational on minicomputers, we have established a working agreement with Codevintec, Inc. They have granted us the loan of Data General NOVA for demonstration at the Leningrad meeting. In most instances the minicomputer can provide considerable and inexpensive computing capacity to a center whenever access to a larger machine is limited, unreliable or impossible. In the future such 'stand alone' operations may change as access to large equipment becomes more feasible. Thus, the mini-

computer could serve as an 'intelligent terminal' to the larger machine. This would provide greater efficiency to the center and its computing abilities.

To assist in our computer development work, a working group on computers and quantitative methods has been formed among the genetic resources workers who have attended our workshops. We will work closely with them to determine a specific work program. We will make accessible, including instruction material, all the information that is currently operational and available on computerized multivariate classification methods. Refinements and development will be undertaken as needed.

The maize project at CIMMYT also involves the development and installation of an integral minicomputer assisted system. The maize program staff at CIMMYT have expressed great concern regarding the integration of computer based assistance which could address directly some of the priorities of the program. The germplasm bank at CIMMYT is not being used effectively within or outside CIMMYT due to problems of evaluation and documentation of the materials in the bank. Dr. Sprague has stated that the top priority in the maize program is the continued development and integration of the international progeny testing program. Such development is to include installation of a minicomputer at CIMMYT and the development of attendant backup computing system in Mexico and the United States. Backup resources would have to be exceptionally reliable because progeny testing is the most important central core of the maize program work at this time. Integration would definitely include the development of the genetic resources bank. This would provide material to the progeny testing program as well as receive the results of the program.

Since our work on minicomputers had concentrated on the USSR Wheat Conference, this represented an opportunity to immediately develop and transfer

the work toward solving a core problem at an international center. The CIMMYT problems are very similar to those encountered at IRRI, CIP, CIAT and IITA. Thus CIMMYT is providing a valid opportunity to work under the real pressures of a working center environment in a model experience.

CIMMYT has some similar problems with their international wheat nurseries. Dr. Finlay has pointed out that these working genetic resources collections present problems as important and complex as those of the germplasm base collections. Work will be done to assure that the current data system is operationally integrated within CIMMYT. This will be implemented first on large scale backup computers at IBM, Mexico. Eventually the computer program will be developed for use on the in-house minicomputer to be installed at CIMMYT.

The work with CIMMYT has provided a test base for determining the interest of IBM and Hewlett-Packard, important multinational corporations, in assisting with the genetic resources project. Negotiations by the GR/CIDS team have enabled the following: The Mexican Science Center of IBM has provided one hour of computer time on the large IBM 370/158 in Mexico City; one-third time of a principal systems programmer, who had been loaned to us previously in connection with the transfer of EXIR to IBM equipment (see page 29); and open access for certain CIMMYT personnel to the IBM computing center with immediate access privileges.

Discussions are underway with Hewlett-Packard for assistance in the development of genetic resources quantitative methods on minicomputers. CIMMYT would be used as the pilot center, as it is anticipated that the same problems will arise at other CGIAR centers and many national centers.

REQUEST FOR ADVICE/ACTION from IBPGR

We are submitting for your consideration the following policy issues:

1. An extension of the terms of reference of the IBPGR to include our present work. As a result of a request made by the Executive Committee we have prepared a draft proposal to the TAC concerning alternative suggestions for such an expansion. This draft is included in the Appendices of this report.

2. A clarification of the role of the IBPGR vis-a-vis the CGIAR funded centers regarding the control of access for national centers according to crop responsibilities.

Enclosed in the appendices is a work program statement for 1976. Additionally, we have included a budget request summary which has been approved by the Executive Committee.

APPENDICES

- A. Statement of Work, Services and Specifications
 - Budget Summary
- B. Tables/Charts
 - Table 1 -- Summary of Site Visits
 - Table 2 -- Summary of Data Banks
 - Table 3 -- Computer Based Assistance in Genetic Resources Functions
 - Chart -- Vigna unguiculata Cluster Analysis
 - Chart -- Vigna unguiculata Graph Analysis
 - Printouts
- C. Workshop Summaries
 - Brief Summary of the Maize Workshop
 - Brief Summary of the Wheat Workshop
- D. Draft Proposal to the Technical Advisory Committee from the International Board for Plant Genetic Resources

STATEMENT OF WORK, SERVICES AND SPECIFICATIONS

The work program for 1976 is basically an extension of that specified in the original proposal and 1975 contract. The major difference is based on feedback from the current activities in genetic resource work. The format has been reorganized to reflect the modifications that this feedback has made in our own activities.

GR/CIDS work program

A. Work Program Components

1. Network Development

- a. Continued systems analysis of the current GR/CIDS using the EXIS system as an analytical tool.
- b. Updating of the computerized catalog jointly established by the GR/CIDS team and FAO/AGPE containing global information on crops, institutions and responsible operating personnel.
- c. Selected visits to centers that have been identified as the most critical for promoting the global network.
- d. Expansion of the responsibilities of the committee established to investigate information flow. This expansion will emanate from the recommendations generated by the committee's work in 1975.
- e. The further development of the best transfer methods between individuals and between centers including newsletters, publications and computer generated reports.
- f. Development of project sets that link institutions for the multi-center utilization of germplasm collection data.

2. Data Germplasm Materials Operations

- a. Continued data service bureau assistance to individuals and centers that cannot gain access to the EXIS system on a computer.
- b. Selected site visits to centers for analyzing and aiding in the organization of their data on germplasm collections.
- c. Assistance in developing and presenting a major substantive portion of several workshops including an international maize germplasm workshop and an international potato germplasm workshop.

- d. Continuation and expansion of the maize and wheat project sets initiated in 1975.
- e. Continuation of the work on data standards for maize and wheat and the development of standards for other crops including rice, beans, potatoes, and groundnuts. This will incorporate the work of the committee established for this purpose.
- f. Updating the multicenter GR/CIDS data banks on maize, wheat, groundnuts, potatoes, beans, and other crops.
- g. Substantially increased training of international personnel in the aspects of data management necessary to carry out genetic resources functions.

3. Computer Based Assistance

- a. Continuation of the development of the EXIS system emphasizing the data organization processing and analysis requirements received from network participants. This will include:
 - (i) evaluation and addition of computerized, multi-variate classification modules;
 - (ii) evaluation and addition of computerized graphical support modules for display purposes;
 - (iii) continued evaluation and development of the TAXIR Data Storage and Retrieval core module.
- b. Continuation and expansion of the EXIS System transfers and utilization for operation on large scale computers and minicomputers.
- c. Coordination and execution of workshops on computing equipment and software packages for data organization, processing and analysis.
- d. Expansion of the exchange of information and methods on quantitative computer-aided procedures. This will be coordinated with the established committee's work and recommendations.
- e. Training of international personnel on special computerized techniques applicable to many center facilities.

- 4. Continued negotiation with national, international, public and private organizations in support of GR/CIDS development.

B. Work Programming and Scheduling

1. The programming and scheduling undertaken by the staff will continue in the same manner as in 1975 in consultation with the Operational Advisory Group.
2. Organizational aspects to continue as in 1975:
 - a. Operational Advisory Group for GR/CIDS
 - b. University of Colorado Genetic Resources and Bionomic Systems Principal Investigator Group
 - c. GR/CIDS Planning, Systems Analysis and Design Group
 - d. GR/CIDS Development and Implementation Group.
 - e. Transfer & Coordination Group.
3. Communication and Reporting function to continue as determined previously.
 - a. Project Director and Project Deputy Director have free and unlimited access to seek information and advice from any member of IBPGR or any individual working in genetic resources work globally.
 - b. All reports, verbal and oral, will be made through the Operational Advisory Group to IBPGR.
 - c. Mr. Pichel, as Chief of AGPE, will receive all reports concerning FAO and will reproduce and distribute these reports as necessary.

Addendum to the Work Programme

The programme of work is broken down into three categories: Network Development, Data Germplasm Material Operations and Computer Based Assistance. The staff effort on these three categories are given as percentage of work to be performed, and the budget allotments approximately coincide with these percentages. Category one, 29%, category two, 46%, and category three accounts for 25%.

In the category, Network Development, the following results will be effected:

- (1) Definition of network components, including computerised data banks of personnel, their institutions, their crop responsibilities; institutional collecting, storage and evaluation capabilities.
- (2) Identification of conservation and distribution collections in the network, i.e. those institutions and individuals with special capabilities at national and international levels. Thus, those institutions capable of base storage capabilities are conservation collections, while those for active storage are distribution collections, and individuals who perform special tasks in genetic resources for various crops, are catalysts within the network.
- (3) Workshops on at least rice, cassava and wheat (for the southern cone of South America) will be organized. These workshops elicit responses to problems of network development.
- (4) Development of communication links between workers in maize, between workers in wheat, etc., via use of computers at national/international centers.

In the category, Data Germplasm Material Operations, the following products/results will be developed:

(1) Production and evaluation of data banks for various crops, including more data placed into those banks already started (see Table 2). This will add to the size and quality of the single computerized information system currently being developed.

(2) Data service bureau clearinghouse activities for individual scientists and institutions. Response to individual questions on genetic resources in neighbouring countries, or between individuals and the central bank data at the University of Colorado will be tested for efficiency and rapidity of responses. Communication links in the form of cyclostyled reports, post-computer processing, and other relatively inexpensive means will also be tested.

(3) Pilot studies for new institutions and crops, e.g. pearl millet, sorghum, pigeon peas and chick pea at ICRISAT; included are data preparation from manual data sets, either in the centres or in Colorado.

(4) Training of appropriate centre personnel in data management of current inventories, at those centres ready for this type of operation. Several centres have specifically requested this type of training, i.e. EMERAPA, ICA, INIA, CIP, PCIM, IRRI and CIMMYT.

(5) Workshop on maize at appropriate location (Colorado?) and potatoes at CIP.

(6) Maize and wheat genetic resources projects on data management for collection, storage and evaluation at several centres simultaneously.

(7) Continued development of standards for crop descriptors in each functional category of genetic resources activities.

In the category, Computer Based Assistance, the following types of products or activities are:

(1) Continued production and implementation of sets of computer programmes for (a) storage and retrieval, (b) evaluation and analysis, including various indices of diversity, clustering programmes, statistical packages of analysis and (c) display.

(2) Continued testing and installation of several standard packages of analysis such as SAS, BMD, SPSS, IMSL, etc.

(3) Further installations of EXIR on appropriately selected (a) large computers (b) minicomputers. In all cases, there must be a careful analysis of the readiness of an institution before installation can take place. The analysis includes evaluation of the local computing environment, personnel capabilities, and a sufficiently large user group.

(4) Workshops for programmers and biometricians on computing equipment for data organizations, processing and analysis. This should include those involved in genetic resources utilization and management functions.

(5) Training sessions in Colorado and at selected sites, in computerized data organization.

GR/CIDS PROJECT
BUDGET SUMMARY 1976

Cost Category	Source of Funds		
	FAO Trust Funds	FAO Regular Programme	
	<u>IBPGR</u>	<u>Contract A</u>	<u>Unit Personnel</u>
1.0 Project Executive/Planning	24,200	-	35,820
2.0 Staff Heads	38,040	23,400	-
3.0 Staff Personnel	142,460	19,000	To be calculated
4.0 Support Costs	99,000	10,000	To be calculated
5.0 Personnel Benefits	5,660	-	To be calculated
6.0 Indirect (overhead) Charges	15,470	2,620	To be calculated
	<u> </u>	<u> </u>	
TOTAL	324,830	55,020	

SUMMARY OF SITE VISITS

Centers	GR/CIDS Activities		
	Network Development	Data/Germplasm Materials Operations	Computer Based Assistance
CGIAR Funded Centers:			
CIMMYT	x	x	x
IRRI	Initial visit, March, 1975		
CIAT		x	x
CIP		x	x
ICRISAT	Initial visit, March, 1975		
ICARDA	Not yet visited		
Regional Centers:			
Izmir		x	
EUCARPIA	x	x	x
Turrialba	Initial meeting, December, 1973		
WARDA	Not yet visited		
Southern Cone	x	x	
National Centers:			
ICA/Colombia	x	x	x
PCIM/Peru	x	x	x
INIA/Mexico		x	x
EMBRAPA/Brasil	x	x	x
USDA/USA		x	x
ARC/UK		x	x
FAL/West Germany	x	x	x
Bogor/Indonesia	Initial visit, March, 1975		

--TABLE 1--

CROP	NAME OF BANK	CENTER	COUNTRY	CENTER CONTACT	DATA CONTENT	# OF ITEMS	# OF DESCIP.	INITIAL DATA FROM			LANGUAGE OF DESCRIPTORS	
								CARD	TAPE	NON-MACH. READABLE		
Bean	CIATPHS	CIAT	Colombia	Lesing/Burns	Breeder	8,656	36		X		Spanish	
Barley	BARLEY	USDA	USA	Craddock	Storage	1,500	42		X		English	
Cowpea	VIGNA	IITA	Nigeria	Rawal	Breeder	4,232	50	X			English	
Guar	GUAR	NSSL	USA	Clark	Breeder	1,134	74		X		English	
Maize	CIMCAT	CIMGTT	Mexico	Bird	Storage	9,000	40		X		English	
	EMBRAPA	EMBRAPA	Brazil	Ruschel	Eval/Stor.	89	47			X	Portuguese	
	ICAZEA	ICA	Colombia	Torregroza	Collector	3,653	42	X			Spanish	
	ICAO17	ICA	Colombia	Torregroza	Expanded Coll	4,495	42		X		Spanish	
	PCIMZ	PCIM	Peru	Salhuana	Storage	98	64		X		Spanish	
	INIAZ	INIA	Mexico	Arrieta	Storage	96	52	X			Spanish	
Manihot	CASSAVA	CIAT	Colombia	Kavano	Evaluation	2,070	33			X	English	
Peanut	PEANUT	Florida	USA	Varnell	Storage	100	35			X	English	
Potato	CIPCOL	CIP	Peru	Rowe	Collector	4,000	40			X	English	
	CIPEVAL	CIP	Peru	Rowe	Evaluation	303	35			X	English	
	CIP	CIP	Peru	Sawyer	Collector*	200	50			X	English	
	SOLANUM	CPC	Scotland	Clendinning	Collector	152	14			X	English	
	USDAAP2	USA	USA	Rowe	Storage*	200	25	X			English	
Wheat	BRWHEAT	Centro Nat Pesquisa de Trigo	Brazil	Sousa	Breeder	64	50			X	English	
	PBIWH TRITICUM	PBI FAL	England Germany	Lupton Seidewitz	Breeder Collector	428 1,200	14 35		X X		English German trans to English	
Various	FAOSEED FAOCROP	FAO FAO	Various Various	Bennett Bennett	Questionnaire Expanded Deeg. Questionnaire	2,250 193	13 14			X X	English English	
	FAOPERS	FAO	Various	Pichel	Mailing List	1,353	10			X	English	
	GSTORGL	FAO	Various	Sykes	Stor. Fac.	27	19			X	English	
	IZMR	Agrian Agr. Ctr.	Turkey	Kjellquist	Collector	2,208	43		X		English	
	NSSLSTO CONTACT	NSSL -	USA -	Clark -	Storage Contact	95,000 1,020	74 13		X		English English	
					Lists							

SUMMARY OF DATA BANKS

Table 2

COMPUTER BASED ASSISTANCE IN
GENETIC RESOURCES FUNCTIONS

<u>GR FUNCTION</u>	<u>COMPUTER METHODS</u>
EXPLORATION/COLLECTION	--INFORMATION STORAGE/RETRIEVAL --DISPLAY CARTOGRAPHIC MAPPING REPORT GENERATED CATALOGS REMOTE SENSING ANALYSES
MAINTENANCE	--INFORMATION STORAGE/RETRIEVAL --REPORT GENERATED INVENTORIES, CATALOGS
EVALUATION	--INFORMATION STORAGE/RETRIEVAL --DIVERSITY INDICES, HISTOGRAMS --CLUSTERING (CLASSIFICATION) --REPORT GENERATED CATALOGS
IMPROVEMENT/BREEDING	--INFORMATION STORAGE/RETRIEVAL --MULTIVARIATE ANALYSES --COMPUTER PRODUCED BREEDING BOOKS --GRAPHIC DISPLAYS
UTILIZATION	--INFORMATION STORAGE/RETRIEVAL --REPORT GENERATED CATALOGS --ACCEPTANCE SAMPLING/MONITORING --MAPPING --ECONOMIC ANALYSES

--TABLE 3 --

U. OF COLO. N. J. F. R. A. U. S. 75/10

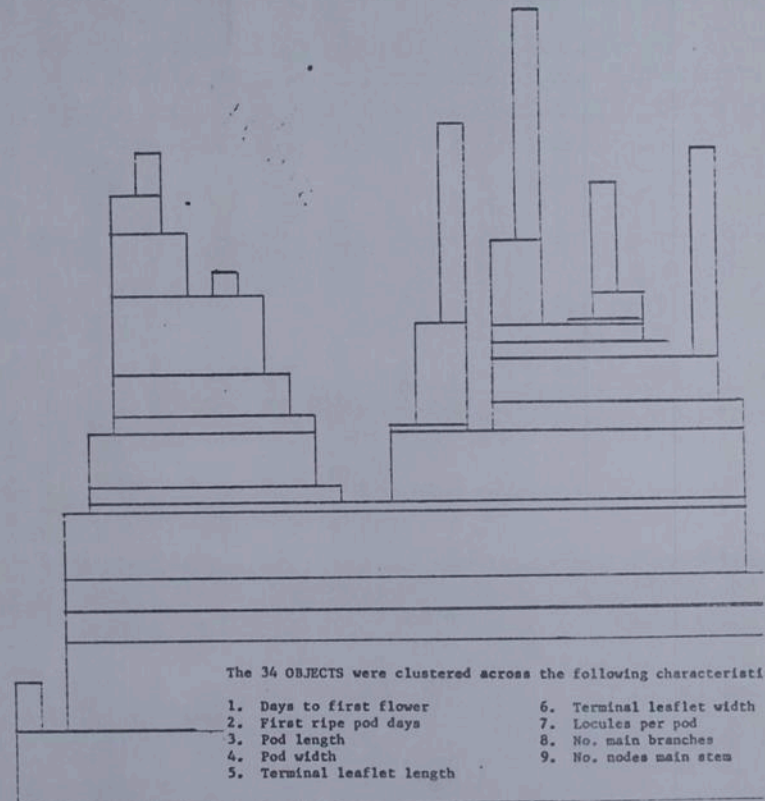
VIGNA UNGUICULATA CLUSTER ANALYSIS

D - VALUE

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.72
.71

OBJECTS

1 2 3 4 5 6 7 8 9



The 34 OBJECTS were clustered across the following characteristics

- | | |
|----------------------------|---------------------------|
| 1. Days to first flower | 6. Terminal leaflet width |
| 2. First ripe pod days | 7. Locules per pod |
| 3. Pod length | 8. No. main branches |
| 4. Pod width | 9. No. nodes main stem |
| 5. Terminal leaflet length | |

The following are some examples of the application of computerized storage and retrieval programs (EXIR) on genetic resources data. They are processed from the Aegean collection data containing over 2200 accessions with 43 descriptors. We have included three illustrations of the data on Triticum L.

1. Collectors Data for Wheat Germplasm Bank
2. Wheat Germplasm Collection Data Bank
3. Sample Queries to Extract More Detailed Information from the Data Banks.

The first two illustrations are in tabular form demonstrating the computer capabilities of generating catalogs. The third illustration shows how one can use the computer for obtaining specific information from the bank without searching through tables manually.

AEGEAN REGIONAL GENETIC RESOURCES CENTER - IZMIR, TURKEY

05/13/75

COLLECTORS DATA FOR WHEAT GERMPHASE BANK

05/13/74

PAGE 1

ID	COLLECTOR	DAY	MO	YR	PRECISE LOCALITY
91	H.AYLA SENCER	18	6	72	50KM E DENIZLI
101	H.AYLA SENCER	18	6	72	EGHDIR
111	H.AYLA SENCER	18	6	72	20KM NW BEYSEHIR
112	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	40KM SW CAN
122	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	28KM SW CAN
132	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	28KM SW CAN
142	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	25KM SW CAN
151	H.AYLA SENCER	19	6	72	ISLAHIYE KAZIKLIKOY
152	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	25KM SW CAN
161	H.AYLA SENCER	19	6	72	ISLAHIYE KAZIKLIKOY
171	H.AYLA SENCER	19	6	72	ISLAHIYE KAZIKLIKOY
181	H.AYLA SENCER	19	6	72	ISLAHIYE KAZIKLIKOY
211	H.AYLA SENCER	19	6	72	ISLAHIYE KAZIKLIKOY
231	H.AYLA SENCER	19	6	72	ISLAHIYE KAZIKLIKOY
241	H.AYLA SENCER	20	6	72	5KM E BIRECIK
261	H.AYLA SENCER	20	6	72	44KM W URFA
271	H.AYLA SENCER	20	6	72	44KM W URFA
281	H.AYLA SENCER	20	6	72	44KM W URFA
291	H.AYLA SENCER	20	6	72	44KM W URFA
311	H.AYLA SENCER	20	6	72	30KM S URFA
312	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	31KM S GONEN
321	H.AYLA SENCER	20	6	72	30KM S URFA
322	EBBE KJELLOVIST H.AYLA SENCER	11	7	73	31KM S GONEN
331	H.AYLA SENCER	20	6	72	46KM W VIRANSEHIR
341	H.AYLA SENCER	20	6	72	46KM W VIRANSEHIR
361	H.AYLA SENCER	20	6	72	46KM W VIRANSEHIR
371	H.AYLA SENCER	20	6	72	20KM W VIRANSEHIR
381	H.AYLA SENCER	20	6	72	20KM W VIRANSEHIR
391	H.AYLA SENCER	20	6	72	39KM W KIZILTEPE
401	H.AYLA SENCER	20	6	72	39KM W KIZILTEPE
421	H.AYLA SENCER	21	6	72	27KM S SAVUR
422	EBBE KJELLOVIST H.AYLA SENCER	13	7	73	10KM SW YIGILCA
481	H.AYLA SENCER	21	6	72	13KM SW IDIL
501	H.AYLA SENCER	21	6	72	13KM SW IDIL
511	H.AYLA SENCER	21	6	72	33KM E CIZRE
521	H.AYLA SENCER	21	6	72	33KM E CIZRE
591	H.AYLA SENCER	22	6	72	30KM S SIRNAK
552	EBBE KJELLOVIST H.AYLA SENCER	14	7	73	50KM S KARABUK
561	H.AYLA SENCER	23	6	72	AGHECKI GECIDI 12KM N MARDIN
562	EBBE KJELLOVIST H.AYLA SENCER	14	7	73	50KM S KARABUK
572	EBBE KJELLOVIST H.AYLA SENCER	14	7	73	31KM S KARABUK
581	H.AYLA SENCER	23	6	72	AGHECKI GECIDI 12KM N MARDIN
582	EBBE KJELLOVIST H.AYLA SENCER	14	7	73	52KM SE BARTIN OVACUMA
592	EBBE KJELLOVIST H.AYLA SENCER	14	7	73	52KM DE BARTIN OVACUMA

COLLECTORS DATA FOR WHEAT GERmplasm BANK

05/13/72

PAGE 2

ID	COLLECTOR	DAY	MO	YR	PRECISE LOCALITY
701		23	6	72	15KM SW SURGUCU
702	EBBE KJELLOVIST H.AYLA SENCER	14	7	73	52KM SE BARTIN OVACUMA
711	H.AYLA SENCER	23	6	72	15KM SW SURGUCU
721	H.AYLA SENCER	23	6	72	15KM SW SURGUCU
731	H.AYLA SENCER	23	6	72	15KM SW SURGUCU
761	H.AYLA SENCER	23	6	72	15KM SW SURUCU
791	H.AYLA SENCER	23	6	72	35KM S DIYARBAKIR
801	H.AYLA SENCER	23	6	72	35KM S DIYARBAKIR
811	H.AYLA SENCER	23	6	72	35KM S DIYARBAKIR
831	H.AYLA SENCER	24	6	72	23KM NW ERGANI
851	H.AYLA SENCER	24	6	72	23KM NW ERGANI
861	H.AYLA SENCER	24	6	72	23KM NW ERGANI
892	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	21KM N DEVREK HACIALI VILLAGE
902	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	21KM N DEVREK HACIALI VILLAGE
912	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	21KM N DEVREK HACIALI VILLAGE
941	H.AYLA SENCER	24	6	72	12KM S PERTEK
951	H.AYLA SENCER	24	6	72	17KM S PERTEK
1011	H.AYLA SENCER	24	6	72	7KM N PEMTEK
1031	H.AYLA SENCER	24	6	72	7KM N PEMTEK
1052	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	5KM N DEVREK
1062	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	5KM N DEVREK
1092	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	22KM W DEVREK
1102	EBBE KJELLOVIST H.AYLA SENCER	15	7	73	45KM W DEVREK
1431	H.AYLA SENCER	5	7	72	7KM NE AYVALIK
1432	EBBE KJELLOVIST H.AYLA SENCER	17	7	73	SILE
1442	EBBE KJELLOVIST H.AYLA SENCER	17	7	73	SILE
1472	EBBE KJELLOVIST H.AYLA SENCER	17	7	73	SILE
1492	EBBE KJELLOVIST H.AYLA SENCER	17	7	73	SILE
1821	H.AYLA SENCER	21	7	72	23KM W LAPSEKI
1871	H.AYLA SENCER	23	7	72	SULTANIYE VILLA
1981	H.AYLA SENCER	23	7	72	N ORHANELI-ERENLI VILLAGE
1891	H.AYLA SENCER	23	7	72	N ORHANELI-ERENLI VILLAGE
2041	H.AYLA SENCER	23	7	72	10KM W TAVSANLI
2052	EBBE KJELLOVIST H.AYLA SENCER	18	8	73	SUNGUHLU
2071	H.AYLA SENCER	23	7	72	TAVSANLI KOPRULEC VILLAGE
2092	EBBE KJELLOVIST H.AYLA SENCER	18	8	73	35KM SW
2041	H.AYLA SENCER	28	7	72	15KM S SINDIROI
2222	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	MENZIFON
2232	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	MENZIFON
2412	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	VEZIRKOPRU
2021	H.AYLA SENCER	30	7	72	30KM ENE BOLU
2031	H.AYLA SENCER	30	7	72	10KM E MNGEN PAZARKOY
2041	H.AYLA SENCER	30	7	72	10KM E MNGEN PAZARKOY
2081	H.AYLA SENCER	30	7	72	10KM E MNGEN PAZARKOY

COLLECTORS DATA FOR WHEAT GERMPLOSM BANK

05/13/74

PAGE 3

ID	COLLECTOR	DAY	MO	YR	PRECISE LOCALITY
2401	H.AYLA SENCER	30	7	72	30KM W CERKES
2421	H.AYLA SENCER	30	7	72	10KM W CERKES
2431	H.AYLA SENCER	30	7	72	8KM E CERKES
2731	H.AYLA SENCER	31	7	72	16KM NE SABANÖZÜ
2041	H.AYLA SENCER	2	8	72	7KM SW YOZGAT
3161	H.AYLA SENCER	3	8	72	13KM SW ZILE
3242	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	BOYABAT 25KMS N
3252	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	BOYABAT 25KMS N
3262	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	BOYABAT 25KMS N
3272	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	GEMZE SOGUKSU
3292	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	GEMZE SOGUKSU
3302	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	GEMZE SOGUKSU
3322	EBBE KJELLOVIST H.AYLA SENCER	19	8	73	GEMZE SOGUKSU
3461	H.AYLA SENCER	5	8	72	30KM N AVANOS KALABA VILLAGE
3462	EBBE KJELLOVIST H.AYLA SENCER	20	8	73	AYANCIK
3482	EBBE KJELLOVIST H.AYLA SENCER	20	8	73	AYANCIK
3492	EBBE KJELLOVIST H.AYLA SENCER	20	8	73	AYANCIK
3411	H.AYLA SENCER	5	8	72	2KM E KAMAN
3512	EBBE KJELLOVIST H.AYLA SENCER	20	8	73	AYANCIK
3731	H.AYLA SENCER	9	8	72	29KM S SAVUR
3771	H.AYLA SENCER	9	8	72	MIDYAT
4132	EBBE KJELLOVIST H.AYLA SENCER	21	8	73	KUKE KAYADIBI VILLAGE
4162	EBBE KJELLOVIST H.AYLA SENCER	21	8	73	KUKE UZUNOZ
4172	EBBE KJELLOVIST H.AYLA SENCER	21	8	73	KUKE UZUNOZ
4202	EBBE KJELLOVIST H.AYLA SENCER	21	8	73	KUKE UZUNOZ
4452	EBBE KJELLOVIST H.AYLA SENCER	22	8	73	
4462	EBBE KJELLOVIST H.AYLA SENCER	22	8	73	
4461	H.AYLA SENCER	26	8	72	25KM S GAZIANTEP
4471	H.AYLA SENCER	26	8	72	25KM S GAZIANTEP
4491	H.AYLA SENCER	26	8	72	25KM S GAZIANTEP
4401	H.AYLA SENCER	26	8	72	25KM S GAZIANTEP
4721	H.AYLA SENCER	27	8	72	KIÇILTEPE TILKITEPE VILLAGE
4782	EBBE KJELLOVIST H.AYLA SENCER	22	8	73	TAKOPRU
4041	H.AYLA SENCER	27	8	72	30KM SW CIZRE
4051	H.AYLA SENCER	27	8	72	30KM SW CIZRE
4091	H.AYLA SENCER	27	8	72	20KM SW CIZRE
5001	H.AYLA SENCER	27	8	72	10KM SW SIRNAK
5061	H.AYLA SENCER	27	8	72	30KM SW BEYTUSSEBAP UZUNGECIT KOYU
5282	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	TOSYA
5411	AHMET UZUNOGLU	9	7	72	10KM W ELMALI KISLA KOYU
5421	AHMET UZUNOGLU	9	7	72	3KM E ELMALI
5431	AHMET UZUNOGLU	9	7	72	3KM E ELMALI
5432	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	35KMS ES TOSYA
5441	AHMET UZUNOGLU	9	7	72	3KM E ELMALI

COLLECTORS DATA FOR WHEAT GERMPLASM BANK

05/13/74

PAGE 4

ID	COLLECTOR	DAY	MO	YR	PRECISE LOCALITY
5A92	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP KUZKOYU
5781	AHMET UZUNOGLU	9	7	72	3KM S KORKUTELI AVDAN
5791	AHMET UZUNOGLU	9	7	72	20KM W KORKUTELI
5P11	AHMET UZUNOGLU	9	7	72	20KM W KORKUTELI
5P12	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP
5P22	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP
5P71	AHMET UZUNOGLU	12	7	72	10KM W ULUKISLA
5P81	AHMET UZUNOGLU	12	7	72	10KM W ULUKISLA
6P11	AHMET UZUNOGLU	12	7	72	30KM S AKSARAY
6P51	AHMET UZUNOGLU	13	7	72	13KM W AKSARAY
6P52	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP
6P71	AHMET UZUNOGLU	13	7	72	22KM SW SULTANHANI
6P72	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP
6I12	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP
6I32	EBBE KJELLOVIST H.AYLA SENCER	23	8	73	ISKILIP
6I41	AHMET UZUNOGLU	13	7	72	10KM E KADINHANI
6I62	AHMET UZUNOGLU	21	6	73	URLA-3KM NW
6I82	AHMET UZUNOGLU	21	6	73	URLA-12KM W KARAALAN VILLAGE
6A82	AHMET UZUNOGLU	22	6	73	URLA BALIKLIOVA 2KM S ARMUTALANI VILLAGE
6A92	AHMET UZUNOGLU	22	6	73	URLA BALIKLIOVA 2KM S ARMUT ALANI VILLAGE
6F02	AHMET UZUNOGLU	22	6	73	URLA BALIKLIOVA 2KM S ARMUT ALANI VILLAGE
6F52	AHMET UZUNOGLU	22	6	73	CEPME 10KM S CIFTLIK VILLAGE
6F82	AHMET UZUNOGLU	23	6	73	CEPME 10KM E ILICALAR
6A62	AHMET UZUNOGLU	23	6	73	CEPME 20KM E
6A72	AHMET UZUNOGLU	23	6	73	CEPME 20KM E
6A82	AHMET UZUNOGLU	23	6	73	CEPME 20KM E
6702	AHMET UZUNOGLU	23	6	73	SEFERIHISAR 20KM N YELKI VILLAGE
6732	AHMET UZUNOGLU	23	6	73	SEFERIHISAR 10KM N CAHLI VILLAGE
6742	AHMET UZUNOGLU	23	6	73	SEFERIHISAR 10KM N CAHLI VILLAGE
6752	AHMET UZUNOGLU	23	6	73	SEFERIHISAR 10KM N CAHLI VILLAGE
7A92	AHMET UZUNOGLU	16	8	73	29KN NW
11T82	AHMET UZUNOGLU	28	8	73	TIREBOLU 55KM S GUNYUZU VILLAGE
12A22	AHMET UZUNOGLU	3	9	73	15KM SE YERLICE VILLAGE
12A32	AHMET UZUNOGLU	3	9	73	15KM SE YERLICE VILLAGE
12A52	AHMET UZUNOGLU	3	9	73	15KM SE YERLICE VILLAGE
16F32	AHMET UZUNOGLU	9	10	73	4KM W KOFAZ

WHEAT GERMPLASM COLLECTION DATA BANK

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TO	SPECIES	PROVINCE	LAT	LONG	ALT	SECONDARY HABITAT
91	MONOCOCUM L.	DENIZLI	37.75	29.60	700	ROADSIDE
101	MONOCOCUM L.	ISPARTA	37.89	30.77	1000	ROADSIDE
111	MONOCOCUM L.	KONYA	37.79	31.64	1050	ROADSIDE
112	TURGIDUM L. EMEND. BOWDEN	CANAKKALE	39.77	26.71	260	CULTIVATED LAND
122	MONOCOCUM L.	CANAKKALE	39.85	26.79	320	CULTIVATED LAND
132	TURGIDUM L. EMEND. BOWDEN	CANAKKALE	39.85	26.79	220	CULTIVATED LAND
142	TURGIDUM L. EMEND. BOWDEN	CANAKKALE	39.87	26.83	340	
151	TURGIDUM L. EMEND. BOWDEN	GAZIANTEP	37.00	36.65	500	CULTIVATED LAND
152	AESTIVUM L. EMEND. BOWDEN	CANAKKALE	39.87	26.83	360	
161	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	GAZIANTEP	37.00	36.65	500	CULTIVATED LAND
171	MONOCOCUM L.	GAZIANTEP	37.00	36.65	500	CULTIVATED LAND
181	CYLINDRICUM CES. PASS. ET GIB.	GAZIANTEP	37.00	36.65	500	CULTIVATED LAND
211	TURGIDUM L. EMEND. BOWDEN	GAZIANTEP	37.00	36.65	500	CULTIVATED LAND
221	TRUNCATAE L. RASPAİL	GAZIANTEP	37.00	36.65	500	CULTIVATED LAND
241	MONOCOCUM L.	URFA	36.98	38.06	770	ROADSIDE
261	MONOCOCUM L.	URFA	37.12	38.31	530	ROADSIDE
271	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	URFA	37.12	38.31	530	ROADSIDE
281	TRUNCATAE L. RASPAİL	URFA	37.12	38.31	530	ROADSIDE
291	CYLINDRICUM CES. PASS. ET GIB.	URFA	37.12	38.31	530	ROADSIDE
311	TRUNCATAE L. RASPAİL	URFA	36.81	38.84	370	ROADSIDE
312	MONOCOCUM L.	PALIKESIR	39.81	27.65	280	CULTIVATED LAND
321	MONOCOCUM L.	URFA	36.81	38.84	370	ROADSIDE
322	MONOCOCUM L.	PALIKESIR	39.81	27.65	280	ROADSIDE
331	MONOCOCUM L.	URFA	37.18	39.25	65	ROADSIDE
341	CYLINDRICUM CES. PASS. ET GIB.	URFA	37.18	39.25	650	ROADSIDE
341	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	URFA	37.18	39.25	650	ROADSIDE
371	MONOCOCUM L.	URFA	37.18	39.53	580	ROADSIDE
391	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	URFA	37.18	39.53	580	ROADSIDE
391	MONOCOCUM L.	MARDIN	37.16	40.14	480	ROADSIDE
401	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	MARDIN	37.16	40.14	480	ROADSIDE
421	MONOCOCUM L.	MARDIN	37.28	40.87	1000	ROADSIDE
422	AESTIVUM L. EMEND. BOWDEN	RUJU	40.83	31.25	310	CULTIVATED LAND
481	MONOCOCUM L.	MARDIN	37.53	40.95	770	ROADSIDE
501	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	MARDIN	37.53	40.95	770	ROADSIDE
511	MONOCOCUM L.	MARDIN	37.12	41.92	470	ROADSIDE
521	SPELTIFORMIS TAUSCH. GRÜN. EX RICHTER	MARDIN	37.12	41.92	470	ROADSIDE
591	CYLINDRICUM CES. PASS. ET GIB.	SIIRT	37.47	42.79	1000	ROADSIDE
602	AESTIVUM L. EMEND. BOWDEN	CANKIRI	40.57	32.62	820	CULTIVATED LAND
641	TRUNCATAE L. RASPAİL	MARDIN	37.40	40.60		ROADSIDE
642	TURGIDUM L. EMEND. BOWDEN	CANKIRI	40.57	32.62	820	CULTIVATED LAND
672	TURGIDUM L. EMEND. BOWDEN	CANKIRI	40.92	32.62	580	CULTIVATED LAND
691		MARDIN	37.40	40.60	970	ROADSIDE
692	TURGIDUM L. EMEND. BOWDEN	ZONGULDAK	41.29	32.78	420	CULTIVATED LAND
692	TURGIDUM L. EMEND. BOWDEN	ZONGULDAK	41.29	32.78	420	CULTIVATED LAND

WLFAT GERPLASM COLLECTION DATA BANK

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TO	SPECIES	PROVINCE	LAT	LONG	ALT	SECONDARY HABITAT
701	MONOCOCCHUM LL	MARDIN	37.48	40.62	900	
702	ACETIVIM L. F. MEND. BOWDEN	ZONGULDAK	41.29	37.78	420	CULTIVATED LAND
711	AVATHUM L. RASPAIL	MARDIN	37.48	40.62	900	
721	TRIUMCTALE LL RASPAIL	MARDIN	37.48	40.62	900	
731	AVATHUM L. RASPAIL	MARDIN	37.48	40.62	900	
741	AVATHUM L. RASPAIL	MARDIN	37.48	40.62	900	
701	CYLINDROICUM CES. PASS. ET GIR.	DIYARRAKIR	37.54	40.30	620	ROADSIDE
801	TRIUMCTALE LL RASPAIL	DIYARRAKIR	37.54	40.30	620	ROADSIDE
811	AVATHUM L. RASPAIL	DIYARRAKIR	37.54	40.30	620	ROADSIDE
831	MONOCOCCHUM LL	DIYARRAKIR	38.38	39.57	700	ROADSIDE
851	TRIUMCTALE LL RASPAIL	DIYARRAKIR	38.38	39.57	700	ROADSIDE
861	MONOCOCCHUM LL	DIYARRAKIR	38.38	39.57	700	ROADSIDE
892	ACETIVIM L. F. MEND. BOWDEN	ZONGULDAK	41.39	31.97	520	CULTIVATED LAND
892	TURGETIUM L. F. MEND. BOWDEN	ZONGULDAK	41.39	31.97	520	CULTIVATED LAND
912	TURGETIUM L. F. MEND. BOWDEN	ZONGULDAK	41.39	31.97	520	CULTIVATED LAND
941	SPELTYTIDES TAUSCH. GREN. EX RICHTER	ELAZIG	38.72	39.32	1300	
951	CYLINDROICUM CES. PASS. ET GIR.	FLAZIG	38.72	39.32	1300	ROADSIDE
1011	AVATHUM L. RASPAIL	FLAZIG	38.90	39.32	1350	ROADSIDE
1021	MONOCOCCHUM LL	FLAZIG	38.90	39.32	1350	ROADSIDE
1052	TURGETIUM L. F. MEND. BOWDEN	ZONGULDAK	41.27	31.97	430	CULTIVATED LAND
1062	TURGETIUM L. F. MEND. BOWDEN	ZONGULDAK	41.27	31.97	430	CULTIVATED LAND
1092	TURGETIUM L. F. MEND. BOWDEN	ZONGULDAK	41.21	31.69	470	CULTIVATED LAND
1192	MONOCOCCHUM LL	ZONGULDAK	41.21	31.42	50	CULTIVATED LAND
1431	MONOCOCCHUM LL	BALIKESIR	39.30	26.75	120	ROADSIDE
1532	TURGETIUM L. F. MEND. BOWDEN	ISTANBUL	41.16	29.64	50	
1542	ACETIVIM L. F. MEND. BOWDEN	ISTANBUL	41.16	29.64	50	
1572	ACETIVIM L. F. MEND. BOWDEN	ISTANBUL	41.16	29.64	50	
1592	ACETIVIM L. F. MEND. BOWDEN	ISTANBUL	41.16	29.64	50	
1821	MONOCOCCHUM LL	CANAKKALE	48.30	26.40	100	
1871	ACETIVIM L. F. MEND. BOWDEN	RIRSA	40.17	28.18	330	
1981	ACETIVIM L. F. MEND. BOWDEN	RIRSA	40.17	28.18	610	CULTIVATED LAND
1901	MONOCOCCHUM LL	RIRSA	40.17	28.18	610	
2061	MONOCOCCHUM LL	KUTAHYA	39.51	29.38	1050	ROADSIDE
2052	TURGETIUM L. F. MEND. BOWDEN	CORIJM	40.16	34.39		
2071	TURGETIUM L. F. MEND. BOWDEN	KUTAHYA	39.51	29.38	900	
2232	TURGETIUM L. F. MEND. BOWDEN	CORIJM	39.96	34.10	1050	
2241	ACETIVIM L. F. MEND. BOWDEN	BALIKESIR	39.05	28.18	650	CULTIVATED LAND
2332	TURGETIUM L. F. MEND. BOWDEN	AHASYA	40.89	35.47	600	
2332	TURGETIUM L. F. MEND. BOWDEN	AHASYA	40.89	35.47	600	
2412	TURGETIUM L. F. MEND. BOWDEN	SINOP	41.15	35.28		
2521	MONOCOCCHUM LL	ROLU	40.81	31.28	650	CULTIVATED LAND
2531	ACETIVIM L. F. MEND. BOWDEN	ROLU	40.94	32.28	700	CULTIVATED LAND
2541	MONOCOCCHUM LL	ROLU	40.94	32.28	700	
2591	TURGETIUM L. F. MEND. BOWDEN	ROLU	40.94	32.28	800	CULTIVATED LAND

WHEAT GERMPLASM COLLECTION DATA BANK

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ID	SPECIES	PROVINCE	LAT	LONG	ALT	SECONDARY HABITAT
2601	AFSTIVUM L. EMEND. ROWDEN	CANKIRI	40.67	32.53	1000	CULTIVATED LAND
2621	AFSTIVUM L. EMEND. ROWDEN	CANKIRI	40.80	32.78	1000	
2671	MONOCOCCHUM L.	CANKIRI	40.80	33.00	1200	ROADSIDE
2731		CANKIRI	40.55	33.44	1250	ROADSIDE
2941	TURGETIUM L. EMEND. ROWDEN	YUZGAT	39.75	34.75	1000	CULTIVATED LAND
3141	MONOCOCCHUM L.	TOKAT	40.21	35.78	750	FIELD BORDER
3242	TURGETIUM L. EMEND. ROWDEN	SINOP	41.69	34.77	900	
3252	AFSTIVUM L. EMEND. ROWDEN	SINOP	41.69	34.77	900	
3262	TURGETIUM L. EMEND. ROWDEN	SINOP	41.69	34.77	900	
3272	AFSTIVUM L. EMEND. ROWDEN	SINOP	41.75	35.23	1200	CULTIVATED LAND
3292	TURGETIUM L. EMEND. ROWDEN	SINOP	41.75	35.23	1200	CULTIVATED LAND
3302	TURGETIUM L. EMEND. ROWDEN	SINOP	41.75	35.23	3200	CULTIVATED LAND
3322	MONOCOCCHUM L.	SINOP	41.75	35.23	1200	CULTIVATED LAND
3441	MONOCOCCHUM L.	NFVSEHIR	38.88	35.88	1130	ROADSIDE
3462	AFSTIVUM L. EMEND. ROWDEN	SINOP	41.96	34.57	530	
3482	TURGETIUM L. EMEND. ROWDEN	SINOP	41.96	34.57	530	
3492	TURGETIUM L. EMEND. ROWDEN	SINOP	41.96	34.57	530	
3511	MONOCOCCHUM L.	KIRSEHIR	41.96	34.57	530	
3512	TURGETIUM L. EMEND. ROWDEN	SINOP	39.33	33.71	1040	ROADSIDE
3731	TURGETIUM L. EMEND. ROWDEN	MARDIN	41.96	34.57	530	
3771	MONOCOCCHUM L.	MARDIN	37.27	40.87	1050	CULTIVATED LAND
4032	AFSTIVUM L. EMEND. ROWDEN	MARDIN	37.40	41.39	1100	ROADSIDE
4162	AFSTIVUM L. EMEND. ROWDEN	KASTAMONU	41.75	33.89	900	
4182	AFSTIVUM L. EMEND. ROWDEN	KASTAMONU	41.71	34.02	1000	
4192	AFSTIVUM L. EMEND. ROWDEN	KASTAMONU	41.71	34.02	1000	
4222	TURGETIUM L. EMEND. ROWDEN	KASTAMONU	41.71	34.02	1000	
4252	AFSTIVUM L. EMEND. ROWDEN	KASTAMONU	41.39	33.78	700	
4262	MONOCOCCHUM L.	KASTAMONU	41.39	33.78	700	
4541	TURGETIUM L. EMEND. ROWDEN	GAZIANTEP	36.83	39.39	800	CULTIVATED LAND
4571	MONOCOCCHUM L.	GAZIANTEP	36.83	39.39	800	CULTIVATED LAND
4591	CYINDRUM CES. PASS. ET GR.	GAZIANTEP	36.83	39.39	800	ROADSIDE
4601	TRIUNGTALE L. PASPAIL	GAZIANTEP	36.83	39.39	800	ROADSIDE
4721	TURGETIUM L. EMEND. ROWDEN	MARDIN	47.18	40.57	550	
4882	TURGETIUM L. EMEND. ROWDEN	KASTAMONU	41.52	34.21	700	
4941	AFSTIVUM L. EMEND. ROWDEN	MARDIN	37.18	41.92	630	CULTIVATED LAND
4951	TURGETIUM L. EMEND. ROWDEN	MARDIN	37.18	41.92	630	CULTIVATED LAND
4981	MONOCOCCHUM L.	MARDIN	37.23	42.00	180	ROADSIDE
5001	MONOCOCCHUM L.	SIRT	37.42	42.40	850	ROADSIDE
5041	AFSTIVUM L. EMEND. ROWDEN	HAKKARI	37.39	42.94	1550	CULTIVATED LAND
5292		KASTAMONU	41.02	34.03	100	CULTIVATED LAND
5411	AFSTIVUM L. EMEND. ROWDEN X TURGETIUM L. EMEND. ROWDEN	ANTALYA	36.72	29.78	1050	CULTIVATED LAND
5421	TRIUNGTALE L. PASPAIL	ANTALYA	36.72	29.94	1090	ROADSIDE
5431	TRIUNGTALE L. PASPAIL	ANTALYA	36.72	29.94	1090	ROADSIDE
5472	AFSTIVUM L. EMEND. ROWDEN	KASTAMONU	40.78	34.33	1500	CULTIVATED LAND
5481	AVATUM L. PASPAIL	ANTALYA	36.72	29.94	1080	ROADSIDE

WHEAT GERMLASM COLLECTION DATA BANK

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ID	SPECIES	PROVINCE	LAT	LONG	ALT	SECONDARY HABITAT
5602	TURGETIUM L. EMEND. BOWDEN	CORUM	40.75	34.33	850	
5701	MONOCOCCIUM L.	ANTALYA	36.79	30.21	1340	ROADSIDE
5701	AFESTIVUM L. EMEND. BOWDEN	ANTALYA	37.08	29.98	1050	
5811	AFESTIVUM L. EMEND. BOWDEN	ANTALYA	37.08	29.98	1050	CULTIVATED LAND
5812	TURGETIUM L. EMEND. BOWDEN	CORUM	41.75	34.47	700	
5822	AFESTIVUM L. EMEND. BOWDEN	CORUM	41.75	34.47	700	
5971	MONOCOCCIUM L.	NIĞDE	37.53	34.39	1180	ROADSIDE
5981	TRITICALE L. RASPALE	NIĞDE	37.53	34.39	1180	ROADSIDE
6011	AFESTIVUM L. EMEND. BOWDEN	NIĞDE	38.27	34.03	1040	CULTIVATED LAND
6051	AFESTIVUM L. EMEND. BOWDEN	NIĞDE	38.39	38.89	860	CULTIVATED LAND
6052	AFESTIVUM L. EMEND. BOWDEN	CORUM	41.75	34.47	700	
6071	AFESTIVUM L. EMEND. BOWDEN	NIĞDE	38.10	33.37	930	CULTIVATED LAND
6072	TURGETIUM L. EMEND. BOWDEN	CORUM	41.75	34.47	700	
6112		CORUM	41.75	34.47	700	CULTIVATED LAND
6132	EMEND. BOWDEN	CORUM	41.75	34.47	700	
6161	TRITICALE L. RASPALE	KONYA	38.23	32.33	1130	ROADSIDE
6162	AFESTIVUM L. EMEND. BOWDEN	IZMIR	38.31	36.73	10	
6182	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.31	26.64	10	CULTIVATED LAND
6402	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.23	26.57	10	
6602	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.23	26.57	10	CULTIVATED LAND
6602	AFESTIVUM L. EMEND. BOWDEN	IZMIR	38.23	26.57	10	CULTIVATED LAND
6602	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.23	26.57	10	CULTIVATED LAND
6602	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.23	26.33	30	CULTIVATED LAND
6602	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.23	26.33	0	CULTIVATED LAND
6672	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.33	26.62	130	CULTIVATED LAND
6682	AFESTIVUM L. EMEND. BOWDEN	IZMIR	38.33	26.62	130	CULTIVATED LAND
6702	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.39	26.92	10	CULTIVATED LAND
6702	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.31	26.83	50	CULTIVATED LAND
6762	TURGETIUM L. EMEND. BOWDEN	IZMIR	38.31	26.83	50	CULTIVATED LAND
6762	AFESTIVUM L. EMEND. BOWDEN	IZMIR	38.31	26.83	50	CULTIVATED LAND
7502	AFESTIVUM L. EMEND. BOWDEN	ERZINCAN	39.96	39.73	2010	CULTIVATED LAND
11102	AFESTIVUM L. EMEND. BOWDEN	GIRSESUN	39.00	38.81	400	
12422	AFESTIVUM L. EMEND. BOWDEN	SAMSUN	41.23	36.33	730	
12422	TURGETIUM L. EMEND. BOWDEN	SAMSUN	41.23	36.33	730	
12452	TURGETIUM L. EMEND. BOWDEN	SAMSUN	41.23	36.33	730	
16532	AFESTIVUM L. EMEND. BOWDEN	KIRKLARELI	41.96	27.10	540	

1 AEGEAN REGIONAL GENETIC RESOURCES CENTER WHFAT QUERIE

DATE: 05/13/75

MO
 THESE ARE EXAMPLES OF PRECISE PINPOINTING OF
 SIGNIFICANT DATA IN A LARGE BANK*

1. MANY HAVE GENUS, TRITICUM L. AND PROVINCE, GAZIANTEP AND NOT LAND FORM,
 KNOWN*

• OF ITFMS IN QUERY RESPONSE = 9
 • OF ITFMS IN THE DATA BANK = 2208
 PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .41

INTI: (ID NUMBER, GENUS, SPECIES), (PROVINCE, LAND FORM) FOR ITEMS WITH RESULT*

• OF ITFMS IN QUERY RESPONSE = 9
 • OF ITFMS IN THE DATA BANK = 2208
 PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .41

1	TRITICUM L.	TURRIDUM L. EMEND. BOWDEN
	GAZIANTEP	HILLY
1	TRITICUM L.	SPFLTOIDES TAUSCH GRN. EX RICHIER
	GAZIANTEP	HILLY
1	TRITICUM L.	MONOCOCCUM L.
	GAZIANTEP	HILLY
1	TRITICUM L.	CYLINDRICUM CES. PASS. ET GIB.
	GAZIANTEP	HILLY

3 AEGEAN REGIONAL GENETIC RESOURCES CENTER WHFAT QUERIE

DATE: 05/13/75

31	TRITICUM L. GAZIANTEP	TRIUNCIATA L. RASPAIL HILLY
561	TRITICUM L. GAZIANTEP	TURRIDUM L. ENEND BOWDEN FLAT
571	TRITICUM L. GAZIANTEP	MONOCOCCUM L. FLAT
591	TRITICUM L. GAZIANTEP	CYLINDRICUM CES. PASS. ET GIB. FLAT
501	TRITICUM L. GAZIANTEP	TRIUNCIATA L. RASPAIL FLAT

OW MANY HAVE GENUS, TRITICUM L. AND SPECIES, MONOCOCCUM L. AND PROVINCE, MARDIN AN SECONDARY HABITAT, ROADSIDE?

0. OF ITEMS IN QUERY RESPONSE = 8
 0. OF ITEMS IN THE DATA BANK = 2208
 PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .36

PRINT: (ID NUMBER, GENUS, SPECIES), (PROVINCE, LAND FORM), (PHYSIOGRAPHY, SOIL CLASS, SECONDARY HABITAT) FOR ITEMS WITH RESULT*

0. OF ITEMS IN QUERY RESPONSE = 8
 0. OF ITEMS IN THE DATA BANK = 2208
 PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .36

91	TRITICUM L. MARDIN	MONOCOCCUM L. FLAT
	PLAIN	ROADSIDE
21	TRITICUM L. MARDIN	MONOCOCCUM L. ---
	---	ROADSIDE
81	TRITICUM L. MARDIN	MONOCOCCUM L. FLAT
	PLAIN	ROADSIDE
11	TRITICUM L. MARDIN	MONOCOCCUM L. ---
	---	ROADSIDE
71	TRITICUM L. MARDIN	MONOCOCCUM L. ---
	---	ROADSIDE
771	TRITICUM L. MARDIN	MONOCOCCUM L. ---
	---	ROADSIDE

3 AEGEAN REGIONAL GENETIC RESOURCES CENTER WHEAT QUERIE

DATE: 05/13/75

741	TRITICUM L.			MONOCOCCUM L.
	HARDIN		---	
				ROADSIDE
991	TRITICUM L.			MONOCOCCUM L.
	HARDIN			FLAT
	PLAIN	LOAMY SILT		ROADSIDE

0% MANY HAVE GENUS, TRITICUM L. AND SECONDARY HABITAT, CULTIVATED LAND AND
 0% SOIL CLASS, UNKNOWN AND NOT SOIL PH, UNKNOWN

0% OF ITFMS IN QUERY RESPONSE = 10
 0% OF ITFMS IN THE DATA BANK = 2208
 PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .45

PRINT: (ID NUMBER, GENUS, SPECIES), (PROVINCE, LAND FORM), (SOIL CLASS, SOIL PH,
 SECONDARY HABITAT) FOR ITEMS WITH RESULT*

0% OF ITFMS IN QUERY RESPONSE = 10
 0% OF ITFMS IN THE DATA BANK = 2208
 PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .45

51	TRITICUM L.			TURGIDUM L. EMEND. BOWDEN
	GAZIANTEP			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND
61	TRITICUM L.			SPALTOIDES TAUSCH GREIN, EX RICHTER
	GAZIANTEP			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND
71	TRITICUM L.			MONOCOCCUM L.
	GAZIANTEP			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND
81	TRITICUM L.			CYLINDRICUM CES. PASS. ET GIOB.
	GAZIANTEP			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND
941	TRITICUM L.			TURGIDUM L. EMEND. BOWDEN
	YOZGAT			HILLY
	SANDY LOAM	MEDIUM		CULTIVATED LAND
191	TRITICUM L.			AETIVUM L. EMEND. BOWDEN
	YOZGAT			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND
201	TRITICUM L.			TURGIDUM L. EMEND. BOWDEN
	YOZGAT			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND
221	TRITICUM L.			TURGIDUM L. EMEND. BOWDEN
	YOZGAT			HILLY
	LOAMY SILT	MEDIUM		CULTIVATED LAND

MID AEGEAN REGIONAL GENETIC RESOURCES CENTER WHEAT QUERIE

DATE: 05/13/75

561	TRITICUM L.		TURGIDUM L. EMEND BOWDEN
	GAZIANTEP		FLAT
	LOAMY SILT	MEDIUM	CULTIVATED LAND
571	TRITICUM L.		MONOCOCCUM L.
	GAZIANTEP		FLAT
	LOAMY SILT	MEDIUM	CULTIVATED LAND

PRINT: (ID NUMBER, GENUS, SPECIES), (PROVINCE, PRIMARY HABITAT) FOR ITEMS WITH
 GENUS, TRITICUM L. AND NOT PRIMARY HABITAT, UNKNOWN*

NO. OF ITFMS IN QUERY RESPONSE = 17 :

NO. OF ITFMS IN THE DATA BANK = 2208

PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .77

711	TRITICUM L.		OVATUM L. RASPAIL
	MARDIN		BROADLEAF DECIDUOUS
721	TRITICUM L.		TRUNCIALE L. RASPAIL
	MARDIN		BROADLEAF DECIDUOUS
731	TRITICUM L.		OVATUM L. RASPAIL
	MARDIN		BROADLEAF DECIDUOUS
761	TRITICUM L.		OVATUM L. RASPAIL
	MARDIN		BROADLEAF DECIDUOUS
741	TRITICUM L.		SPELTOIDES TAUSCH. GREN-EX RICHTER
	ELAZIG		NEEDLELEAF EVERGREEN
1071	TRITICUM L.		TURGIDUM L. EMEND. BOWDEN
	TUNCFR		BROADLEAF DECIDUOUS
1081	TRITICUM L.		MONOCOCCUM L.
	TUNCFLI		BROADLEAF DECIDUOUS
1091	TRITICUM L.		SPELTOIDES TAUSCH. GREN-EX RICHTER
	TUNCFLI		BROADLEAF DECIDUOUS
1101	TRITICUM L.		DICHASIANUS ZHUK. BOWDEN
	TUNCFLI		BROADLEAF DECIDUOUS
1091	TRITICUM L.		MONOCOCCUM L.
	BURSA		BROADLEAF EVERGREEN
2071	TRITICUM L.		TURGIDUM L. EMEND. BOWDEN
	KUTAMYA		BROADLEAF DECIDUOUS
2621	TRITICUM L.		AESTIVUM L. EMEND. BOWDEN
	CANKIRI		BROADLEAF EVERGREEN
3651	TRITICUM L.		TURGIDUM L. EMEND. BOWDEN
	TUNCFLI		BROADLEAF DECIDUOUS
3661	TRITICUM L.		MONOCOCCUM L.
	TUNCFLI		BROADLEAF DECIDUOUS
3671	TRITICUM L.		OVATUM L. RASPAIL
	TUNCFLI		BROADLEAF DECIDUOUS

D AEGEAN REGIONAL GENETIC RESOURCES CENTER WHEAT QUERIE

DATE: 05/13/75

591	TPITICUM L.	DICHASIANUS ZHUK. BOWDEN
	TUNCFLI	BROADLEAF DECIDUOUS
701	TPITICUM L.	SPELTOIDES TAUSCH. GREN+EX RICHTER
	TUNCFLI	BROADLEAF DECIDUOUS

OW MANY HAVE GENUS,TRITICUM L. AND SECONDARY HABITAT,CULTIVATED LAND AND NOT
PHYSIOGRAPHY,UNKNOWN*

0. OF ITEMS IN QUERY RESPONSE = 12
0. OF ITEMS IN THE DATA BANK = 2208
PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .54

PRINT: (ID NUMBER,GENUS,SPECIES),(PROVINCE,PHYSIOGRAPHY,SECONDARY HABITAT) FOR
ITEMS WITH RESULT*

0. OF ITEMS IN QUERY RESPONSE = 12
0. OF ITEMS IN THE DATA BANK = 2208
PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .54

51	TPITICUM L.	TURGIDUM L.EMEND.BOWDEN
	GAZIANTEP	PLAIN CULTIVATED LAND
61	TPITICUM L.	SPELTOIDES TAUSCH GREN,EX RICHTER
	GAZIANTEP	PLAIN CULTIVATED LAND
71	TPITICUM L.	MONOCOCCUM L.
	GAZIANTEP	PLAIN CULTIVATED LAND
81	TPITICUM L.	CYLINDRICUM CES.PASS.ET GIB.
	GAZIANTEP	PLAIN CULTIVATED LAND
31	TPITICUM L.	TRIUNCIALE L. RASPAIL
	GAZIANTEP	PLAIN CULTIVATED LAND
941	TPITICUM L.	TURGIDUM L.EMEND.BOWDEN
	YOZGAT	VALLEY CULTIVATED LAND
191	TPITICUM L.	AESTIVUM L.EMEND.BOWDEN
	YOZGAT	SLOPE CULTIVATED LAND
201	TPITICUM L.	TURGIDUM L.EMEND.BOWDEN
	YOZGAT	SLOPE CULTIVATED LAND
221	TPITICUM L.	TURGIDUM L.EMEND.BOWDEN
	YOZGAT	SLOPE CULTIVATED LAND
561	TPITICUM L.	TURGIDUM L.EMEND.BOWDEN
	GAZIANTEP	PLAIN CULTIVATED LAND
571	TPITICUM L.	MONOCOCCUM L.
	GAZIANTEP	PLAIN CULTIVATED LAND
861	TPITICUM L.	AESTIVUM L.EMEND.BOWDEN
	HAKKARI	VALLEY CULTIVATED LAND

PRINT: (ID NUMBER,GENUS,SPECIES),(PHOTOGRAPH,PRIMARY HABITAT) FOR ITEMS WITH

AEGEAN REGIONAL GENETIC RESOURCES CENTER WHEAT QUERIE

DATE: 05/13/75

MUS. TRITICUM L. AND NOT PHOTOGRAPH, UNKNOWN*

* OF ITFMS IN QUERY RESPONSE = 2
* OF ITFMS IN THE DATA BANK = 2208
PERCENTAGE OF RESPONSE/TOTAL DATA BANK = .09

1	TRITICUM L.		MONOCOCCUM L.
	HAB. B.W.	---	
41	TRITICUM L.		MONOCOCCUM
	HAB. COL.	---	

D

TOTAL RUN TIME IN SECONDS
CENTRAL PROCESSOR = 5.032

BRIEF SUMMARY OF THE MAIZE WORKSHOP

In February, 1975, the International Board for Plant Genetic Resources sponsored an international maize germplasm workshop held in Boulder, Colorado. It was coordinated by the GR/CIDS team from the University of Colorado. The purpose of the workshop was to begin to investigate the existing problems of communication and exchange of maize data and germplasm and to work together with the participating scientists to develop an action program to investigate the information network for maize.

One of the recommendations that emerged from the workshop led to the creation of an integrated maize germplasm project which brings together those scientists working at several national and international centers to work cooperatively in the investigation and analysis of the blockages to the effective communication and exchange of maize germplasm data and data material.

Also from the workshop, three working groups emerged with membership from the workshop participants, to consider three areas of critical concern. These include descriptor standards, computer assisted quantitative methods, and network and communication development.

The Maize Workshop reached no single resolution concerning any descriptor standards. All aspects of plant description were left to the individual worker with recommendations for using the MKS system whenever possible. A need was identified for detailed studies on the use of descriptors/characters in all maize genetic resources function now and in the near future. This study was implemented through establishing a working group on germplasm material and data. A project of their immediate concern is the development of observation/measurement standards for descriptors. Previously this has not received consistent and continuing attention on an organized basis.

Another working group was formed for the study of useful and available computer assisted quantitative methods - how these could be obtained and transferred effectively to centers that could use them.

A third group assists in the investigation of the methods to establish a network of communication and exchange for maize data and germplasm. This includes an analysis of the blockages to such communications exchange and the probable pressures placed on the network to meet the changing demands from genetic resources workers across all genetic resources functions.

Seemingly the most critical problems to emerge from the workshop deal with motivating the operating scientist at every genetic resources function level to use the data and germplasm banks effectively. To do this, blockages must be identified, understood and the data/germplasm bank system must be made responsive to the reasons for blockage.

The Joint Maize Project, which had its beginnings at the workshop, has the following preliminary group of centers participating: CIMMYT, ICA, PCIM, INIA, EMBRAPA. This list is expected to expand. With some of these centers, work is currently underway. For others, the particular center specific projects are in the planning stages. By integrating this work on a continual basis, the joint team of GR/CIDS personnel and scientists from each of the centers are endeavoring to improve the maize germplasm collection information so that maximum availability and validity of this information and corresponding material can be achieved. This will be done by integrating all the available data from many sources for use at each center. This includes data from previous evaluations.

With the data bank, the current inventory in the genetic resources collection can be carefully checked and reviewed. Subsequently the maintenance methods and systems can be evaluated so that the germplasm bank maintenance

information systems can be updated to allow for computerized control. A basic center specific catalog can be developed to test new methods of cataloging genetic resources information. Furthermore, the data bank can be used to explore the reasons for its non-use, within the center and at other centers.

Then data banks from several critical centers will be combined using maximum descriptor methods (include all descriptors defined by all workers). Necessary conversions will be made based on the specified standards for measurement. This combination will be used to make geographic mappings of areas collected and to calculate indices of genetic diversity by a number of methods. This information and basic exercise will be used as input to standardize descriptor definitions, to measure standards and evaluations, and to meet collections requirements.

As a natural progression of the work, we recommend that an international maize germplasm conference be held. We suggest that the input for this conference come from several workshops to be held strategically as the project develops. The basic purpose of the conference would be to discuss in detail certain problems concerning evaluation, collection, exchange of information and material, descriptor measurement standards based on this experiment, and to cooperatively develop ways to resolve these problems at the conference itself. It is suggested that the conference take place in late 1976.

PARTICIPANTS - Maize Workshop

February 9-14, 1975

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OBJECTIVES AND AGENDA

MAIZE WORKSHOP

FEBRUARY 9-15, 1975

There are a number of objectives we wish to cover. The principle ones are as follows:

- A. To jointly determine as a cooperating team the best procedures for analyzing the genetic resources functions that can or should be aided by computer techniques. Specifically, and at the top of the list, is the creation, utilization and communication of data on existing genetic resources.
- B. To introduce the Executive Information System (EXIS), describe its capacity, and have a forum to "re-design" EXIS with the participants to assure that it will satisfy the needs of genetic resources work.
- C. Flowing from A and B, we wish to reach detailed accords for studying, installing, and implementing EXIS at the participants' centers. In conjunction with this we hope to jointly design the most effective methods to implement the transfer (i.e., installation, instruction in use of system, creation of machine readable data bases for each individual center, implementation of system throughout a center, etc.) of the system to various types of centers. Included in such a design is the discussion of a strategy for arriving at information standards, including standards for the collection and dissemination of data on genetic resources specifically Zea mays. As part of this is discussion and design of a global Zea common data base.

AGENDA

Sunday, February 9, 1975

Throughout Day:

Arrival of participants.
Participants met at airport and transported to hotel.
Materials delivered to participants for review.
Recuperate from jet lag; adapt to altitude . . .

Monday, February 10, 1975

- 8:15 am Meet in lobby of Harvest House for transportation to UMC for breakfast. (wives invited)
- 8:30 am Breakfast Meeting, hosted by President Roland Rautenstrauss.
- 10:00 am - 12:30 pm
Century Room Introduction to Genetic Resources Communication Information Documentation System (GRCIDS)
- A. Workshop Objectives
 - B. Operating Structure and Participating Organizations
 - C. Operational Policy and Assumptions --
The User as the point of focus from Systems Analysis to Implementation
- 2:00 pm - 5:30 pm
Century Room
- A. The GRCIDS Concept
Analysis of decision points, DATA/
Information flow and DATA Interperative models.
 - B. The Genetic Resources Function and EXIS Design
 - C. EXIS demonstrated on several real or function problems
 - D. Open Discussion
- 6:00 pm Meet in lobby for transportation (Participants, wives, and staff) to Koenig Alumni Center to meet GRCIDS III Project Staff for cocktails.
- Transportation will be available to return to Harvest House.
- Dinner at your leisure.

Agenda
Page Three

Tuesday, February 11, 1975

8:30 am - 12:00 noon and 2:00 pm - 5:00 pm
Century Room

- A. Open Discussion and Questions
- B. The EXIS Modules
 - EXIR = TAXIR/STIRS
 - Synthesis and Analysis Modules
 - Display
 - Instruction/Orientation in the Use of EXIS
- C. Discussion of Continued EXIS Design, Development and Implementation
- D. Display with your own data banks. Hand Out.

Dinner at your leisure.

7:15 pm Meet in the lobby for transportation to Computing Center

7:30 pm - 10:30 om Computing Center
---Work on designing own data bank from examples handed out, or from available data banks. All advisors will be present.
---Tour of facilities possible if interested.

Wednesday, February 12, 1975

8:30 am - 12:00 noon Continued work/discussion on EXIS. What
Century Room else should be in EXIS. The problem of EXIS transfer.

12:00 noon - 1:15 pm Lunch

1:30 pm Meet Harvest House lobby for bus to Ft. Collins.

2:30 pm - 5:00 pm Tour of the United States Department of
Agriculture, National Seed Storage Laboratory,
Ft. Collins, and discussion. (wives invited)

6:00 pm Dinner in Ft. Collins.

Thursday, February 13, 1975

8:30 am - 12:00 noon
Century Room

EXIS as related to Genetic Resources Standards

- A. Standards deal with specific problems concerning nature, number of characteristics recorded, standard methods of recording observations, storing, retrieving and processing information.
- B. EXIS can assist in providing information to a group of users studying and setting standards. Using its capacity to synonymize, or reformat, or change information to meet standards, it is possible to study the relative value of information.
- C. Maintenance standards as related to the actual germplasm or herbaria collection.

12:00 noon - 2:00 pm

Lunch

2:00 pm - 5:00 pm
Century Room
Dinner at your leisure

General Discussion of Standards.

7:15 pm

Meet in lobby of Harvest House for transportation to Computing Center.

7:30 pm

Further work on EXIS problems and discussion of standards.

Friday, February 14, 1975

8:30 am - 12:00 noon
Horizon East

Methods of Assessing Standards

From the discussions we would like to compile the recommendations for assessing standards. Further, we would like to discuss a strategy to promote further work in establishing and implementing standards.

12:00 noon - 2:00 pm

Lunch

2:00 pm - 5:00 pm
Horizon East

Accords

As in our objective C, we hope to draw up accords that will further our work with the various centers, especially with regard to installing and implementing the system at the various centers.

Agenda
Page Five

- 6:15 pm Meet in lobby of Harvest House for transportation to Faculty Club.
- 6:30 pm Dinner, Hosted by Taximetrics Laboratory (wives invited)

Saturday, February 15, 1975

Free for optional tours, shopping, etc., or departure.
Transportation provided.

Please see Joan Louis during week if you have any requests to do any sightseeing, or if you would like help shopping, etc.

BRIEF SUMMARY OF THE WHEAT WORKSHOP

In February, 1975, the International Board for Plant Genetic Resources sponsored an international wheat germplasm workshop, held in Boulder, Colorado. The purpose of the workshop was to assist in presenting critical ideas and recommendations to the Leningrad conference and to begin at once on implementing certain project concepts. Additionally the workshop was to present the GR/CIDS concept for comment and criticism.

The preliminary concepts for a wheat germplasm project set, which are very tentative at this time, emanate from the Boulder Wheat Workshop. Some of these concepts will be presented in greater detail at the Wheat Conference in Leningrad. Other ideas and concerns have been brought in from the Centro Nacional de Pesquisas de Trigo regional wheat meetings and other meetings held prior to the Leningrad meetings.

Certain accords have been reached on recommended descriptor reporting standards and data reporting formats. These follow the Seidewitz proposal as endorsed by EUCARPIA.

Certain accords have been reached on recommended descriptor reporting standards and data reporting formats. These follow the Seidewitz proposal as endorsed by EUCARPIA. Specifically they are:

(a) Whenever a relative scale descriptor is used, a code will be assigned to the observation state in the increasing order of empirical expression of the characteristic beginning with the minimum or weakest observation state. If code numbers are used, the range will be from one to nine. Alphanumeric character codes may be used as for disease/pest reactions. The range will be from hypersensitive to immune with as many steps as required.

(b) Regarding data transmission, for non-machine readable data a written

matrix will be used. An 'item' or accession or collection will be row data with each marked column representing a descriptor/character state.

For machine readable data, the use of punched cards is discouraged for international communication. Magnetic tapes should be nine track, external BCD with standard labels, 800 BPI; card images constituting an entire item (accession) with as many cards as required in sequence. The testing of images is to be included, with tape or paper. A clear, legible, carefully prepared statement must accompany the data. The statement must carefully define the descriptor as to name of descriptor, observation/measurement methods, method of recording, location and length on columnar or card images, location in file.

The substance of the discussion at the workshop was concerned with the development of a set of minimum recommended descriptors. It is essential to choose the minimum set of descriptors for a systematic reason. The minimum set specified is to provide sufficient data feedback to allow for the mapping of location of collection sites and to measure quickly the genetic diversity of collections. The minimum set of descriptors are also to provide basic information for collection identification as it is processed, evaluated and distributed.

Beyond the minimum set of descriptors it was decided that each worker/center would determine the descriptors and characters to be evaluated and used. Evaluations must be standardized to assure data validity and precision. Data must enter the information system as part of the centers' function and from there to the international network. The technology to do this is available and the GR/CIDS team is willing to explain and assist in the transfer of this technology to the centers.

Participants at the conference debated on whether the backlog of basic

data should be made operational before the current data in germplasm collections is brought up to an operational level. On the one hand, knowing what is in a collection and what can be made available for mapping and diversity functions can lead to better planned and executed research. On the other hand, the loss of current material is happening at such an alarming rate that it is necessary to record as much diverse current information as possible. It was pointed out that it would be ideal to proceed along both lines if possible.

An interesting discussion accompanied the above debate. It was felt that the subjective and expert opinions of collectors concerning the diversity of germplasm within an area was all the information needed for future collection planning. It was then pointed out, however, that data studies using various computer assisted diversity techniques have demonstrated that expert opinion was often very incorrect in these matters. The GR/CIDS personnel pointed out that there are methods available for recording subjective opinions and that together with objective data these could be used in analyzing collection planning.

To this end, the group decided to encourage all who had important collections to contribute both their data and their subjective judgments. A standard letter was developed from one of the workshop sub-groups which was sent to the participants' colleagues seeking their immediate support. The GR/CIDS team will coordinate the information data flow and analysis to present this at the Leningrad meeting as a continuing project recommendation.

There was further concern that work be done on developing useful diversity models and subjective judgment analysis models. What is currently available however is to be used immediately.

PARTICIPANTS - Wheat Workshop

February 23-26, 1975

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OBJECTIVES AND AGENDA

WHEAT WORKSHOP

FEBRUARY 24-26, 1975

There are a number of objectives we wish to cover. The principles ones are as follows:

- A. In general to explain the nature of the GRCIDS (Genetic Resources Communication Information Documentation System) concept and specifically to discuss how these concepts pertain to Wheat as a crop.
- B. Explain the developemnt of various computer related methods to assist in genetic resources work with some emphasis on the explanation of the EXIS system which indeed is a preliminary concept.
- C. To develop presentation and working agenda for the scientific component to be presented by the GRCIDS team at the Leningrad Conference in July, 1975 (The International Wheat Symposium).
- D. If there is time, to discuss specific accords with the participating institution at the workshop.

AGENDA

Sunday, February 23, 1975

Throughout Day:

Arrival of participants
Participants met at airport and transported to College Inn.
Materials delivered to participants for review.
Recuperate from jet lag; adapt to altitude.
Dinner served at College Inn between 5:30-6:30 pm
(cafeteria style - go through line)

Agenda
Page Two

Monday, February 24, 1975

- 7:30 am Meet in dining hall for breakfast with GRCIDS staff
- 9:00 am - 12:00 noon Introduction to Genetic Resources Communication
and Information Documentation System (GRCIDS)
- 1:30 pm - 5:00 pm Spruce Room
- A. Workshop objectives
 - B. Operating Structure and Participating Organizations
 - C. Operational Policy and Assumptions --
The User as the Point of Focus from
Systems Analysis to Implementation
 - D. The GRCIDS Concept
Analysis of decision points, DATA/Information
Flow and DATA Interpretive Models
 - E. The Genetic Resources Function and EXIS Design
 - F. Open Discussion
- 12:00 noon - 1:00 p.m. Lunch at College Inn
- 5:30 pm - 6:30 pm Dinner at College Inn

Tuesday, February 25, 1975

- 7:00 am - 8:00 am Breakfast at College Inn
- 8:30 am - 12:00 noon Spruce Room
- A. Open Discussion and Questions
 - B. EXIS as a probe for computer based methods
to aid Genetic Resources workers.
 - EXIS = TAXIR/STIRS
 - Synthesis and Analysis methods/programs
 - Display methods/programs
 - Instruction/Orientation in the Use of
computer based systems.
 - C. Discussion of Continued EXIS Design
Development and Implementation.
- 12:00 noon - 1:00 pm Lunch at College Inn

Agenda
Page Three

- 1:30 pm - 5:00 pm
Spruce Room
- Standards
- General Discussion on Standards
- A. Standards deal with specific problems concerning nature, number of characteristics recorded, standard methods of recording observations, storing, retrieving and processing information.
 - B. EXIS and Standards compatibility
 - C. Maintenance standards as related to the actual germ-plasm or herbaria collection.
- 5:30 pm - 6:30 pm
- Dinner at College Inn
- 7:15 pm
- Meet in the lobby of the College Inn for transportation to the Computing Center
- 7:30 pm - 10:30 pm
- Computing Center
- Work on designing own data bank from examples handed out, or from available data banks. All advisors will be present.
- Tour of facilities possible if interested.

Wednesday, February 26, 1975

- 7:00 am - 8:00 am
- Breakfast at College Inn
- 8:30 am - 12:00 noon
and
- Working Session on agenda for International Wheat Symposium
- 1:30 pm - 5:00 pm
Spruce Room
- 12:00 noon - 1:00 pm
- Lunch at College Inn
- 6:15 pm
- Meet in the lobby of the College Inn for transportation to the UMC
- 6:30 pm
- Farewell Dinner, UMC, East Lounge