OFFICE MEMORANDUM

TO: Mr. Warren C. Baum
FROM: Bruce M. Cheek
SUBJECT: Notes of Center Directors' Meeting, Cali, March 1974

DATE: June 13, 1974

We have just received the Selected Notes of the Meeting of the Directors of the International agricultural research centers which was held at CIAT in Colombia on March 4-7, 1974. They can be circulated to CG members, as they were last year, at the discretion of the Secretariat. I propose to circulate them because they summarize succinctly some of the administrative and scientific problems with which the centers are concerned and often give center Directors' views or intended lines of action, particularly in preparation for their July 26-27 meeting just prior to Centers Week.

The Directors' Notes highlight:

(a) Center procurement problems, given the withdrawal of the Ford and Rockefeller support in this field, and a request to the IIE to make a proposal for taking up the work (page 3).

(b) Statistical and computing accounting systems, a discussion to be followed by a review with the Canadian P. S. Ross firm at the July Directors' meeting (page 8).

(c) Overhead policies for restricted core and special project grants on which Hanson is to circulate material as a basis for reaching agreement on a common policy at the July meeting (page 4).

(d) Outreach programs - criteria for acceptance, staffing, center cooperation. Hanson, Athwal and Nickel to report to the July meeting (page 5).

(e) Center funding - problems of delays in funding, carryovers, etc. Further review in July and recommendations to be made to Secretariat as necessary (pages 6, 18).

(f) CG relationships - budgeting, center review procedures (page 13), donor funding (page 18).

(g) Relationships between centers on rice and maize research (pages 14-16).

(h) Linkages - funding problems for regional research programs (pages 10, 11).

(i) Training programs, policies and procedures. One day to be devoted to these at the July meeting (pages 4, 5).
(j) World food situation - preliminary notes on effects on center operations of energy and fertilizer situation (page 12 and annex).

(k) Small farmers problems - scale neutral technology, etc. (pages 12, 13).

(l) Protein quality and quantity (page 17).

Following the July meeting, the Directors will meet again on February 24, 1975, at IITA. Their provisional agenda includes food stocks, protein problems, constraints on new technologies, land use, nitrogen fixation, relations with UNEP, legumes research (page 16).

cc: Sir John Crawford
    Dr. W. David Hopper
    Mr. Yudelman
    Mr. Graves
    Mr. Coulter

BMC:mcj
SELECTED NOTES

MEETING OF DIRECTORS

INTERNATIONAL AGRICULTURAL RESEARCH CENTERS

MARCH 4-7, 1974

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL
CALI, COLOMBIA
SELECTED NOTES

Meeting of Directors
International Agricultural Research Centers
March 4-7, 1974

Centro Internacional de Agricultura Tropical
Cali, Colombia

Participating Centers:
AVRDC  Asian Vegetable Research and Development Center
CIAT   Centro Internacional de Agricultura Tropical
CIMMYT Centro Internacional de Mejoramiento de Maiz y Trigo
CIP    Centro Internacional de la Papa
ICRISAT International Center for Research in the Semi-Arid Tropics
ILCA   International Livestock Center for Africa
IRRI   International Rice Research Institute
IITA   International Institute for Tropical Agriculture
FOREWORD

Directors of the various international agricultural research and training centers convened at the headquarters of the Centro Internacional de Agricultura Tropical, Cali, Colombia, March 4-7, 1974. This was the fourth regular semi-annual meeting of the Directors, the first such meeting being during Centers' Week, 1972, the second at Villa Serbelloni, Bellagio, Italy, in February, 1973, and the third at Washington, D.C., during Centers' Week, 1973.

Eight of the nine existing international Centers were represented at this meeting, the Director of ILRAD being unable to attend because of illness. Many of the Centers were represented by both the Director and the Deputy or Associate.

At various times during the meeting at CIAT, resource persons, as identified, participated in the discussions.

These notes do not represent detailed minutes of the Directors' deliberations but rather, as Selected Notes, attempt to record for the future information of the Directors, their staffs, and the Consultative Group the important issues identified and discussed.

Detailed information about many of the subjects discussed may be obtained by writing directly to the Director of the Center identified.

Francis C. Byrnes
Secretary
## CONTENTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td></td>
</tr>
<tr>
<td>Meeting Participants</td>
<td></td>
</tr>
<tr>
<td>A. Discussions with IIE Representatives</td>
<td>1</td>
</tr>
<tr>
<td>Offshore retirement</td>
<td></td>
</tr>
<tr>
<td>Release of reserve funds</td>
<td></td>
</tr>
<tr>
<td>Revision in insurance coverage</td>
<td></td>
</tr>
<tr>
<td>Increase in IIE administrative fee</td>
<td></td>
</tr>
<tr>
<td>IIE services on publications</td>
<td></td>
</tr>
<tr>
<td>Public relations for centers</td>
<td></td>
</tr>
<tr>
<td>Purchasing services</td>
<td></td>
</tr>
<tr>
<td>B. Brochure on CG and Centers</td>
<td>3</td>
</tr>
<tr>
<td>C. Overhead Charges</td>
<td>4</td>
</tr>
<tr>
<td>D. Next Meeting of Center Directors</td>
<td>4</td>
</tr>
<tr>
<td>E. Outreach Grants</td>
<td>5</td>
</tr>
<tr>
<td>F. Coordination Among Centers on Administration of Senior Staff</td>
<td>5</td>
</tr>
<tr>
<td>G. Scheduling and Receipt of Funds</td>
<td>6</td>
</tr>
<tr>
<td>H. Letter from John Hannah</td>
<td>7</td>
</tr>
<tr>
<td>I. Income Tax for U.S. Citizens Employed by Centers</td>
<td>7</td>
</tr>
<tr>
<td>J. Statistical and Computing Accounting Systems and Hardware</td>
<td>8</td>
</tr>
<tr>
<td>K. Increasing Efficiency of Center Libraries</td>
<td>8</td>
</tr>
<tr>
<td>L. Linkages Between an International Center, National Programs, Regional Services, and Other Centers</td>
<td>9</td>
</tr>
<tr>
<td>M. World Fertilizer Situation</td>
<td>12</td>
</tr>
<tr>
<td>N. Experiences with Agricultural Development Projects</td>
<td>12</td>
</tr>
<tr>
<td>O. Relations with Consultative Group</td>
<td>13</td>
</tr>
<tr>
<td>P. Inter-Center Responsibilities: RICE</td>
<td>14</td>
</tr>
<tr>
<td>Q. Inter-Center Responsibilities: MAIZE</td>
<td>16</td>
</tr>
<tr>
<td>R. Meeting at IITA in 1975</td>
<td>16</td>
</tr>
</tbody>
</table>
S. UNDP-FAO Workshop on Application of Agricultural Research 17
T. Evaluation of Protein Quantity and Quality 17
U. Other Administrative Matters 17
V. Meeting with World Food Institute Representatives 18

Appendix

Notes on World Fertilizer Situation and Its Impact Upon the Work of the International Centers.
MEETING PARTICIPANTS

Asian Vegetable Research and Development Center - AVRDC
  Robert F. Chandler, Jr., Director
  C. L. Luh, Associate Director

Centro Internacional de Agricultura Tropical - CIAT
  U. J. Grant, Director General
  Eduardo Alvarez-Luna, Deputy Director General
  Francis C. Byrnes, Leader, Training and Communication

Centro Internacional de Mejoramiento de Maiz y Trigo - CIMMYT
  Haldore Hanson, Director General

Centro Internacional de la Papa
  Richard Sawyer, Director
  Orville Page, Acting Deputy Director

International Center for Research in the Semi-Arid Tropics - ICRISAT
  J. S. Kanwar, Associate Director

International Livestock Center for Africa - ILCA
  Jean Pagot, Director

International Rice Research Institute - IRRI
  Nyle Brady, Director
  D. S. Atwal, Associate Director

International Institute for Tropical Agriculture - IITA
  Herbert Albrecht, Director General
  John Nickel, Deputy Director General

Program and Resource People

International Institute for Education - IIE
  Richard Meyr
  Cyriac Thanikary

International Bank for Reconstruction and Development - IBRD
  Montague Yudelman

Tennessee Valley Association - TVA
  Donald McCune
P. S. Ross and Partners
A. P. Bogie
Robert L. Cummings, Jr.

Centro Internacional de Agricultura Tropical - CIAT
Charles Francis
Alberto Pradilla
Fernando Monge
P. R. Jennings

Rockefeller Foundation
Dorothy Parker (retired)

Centro Internacional de Mejoramiento de Maíz y Trigo - CIMMYT
Ernest Sprague
Glenn Anderson

World Food Institute
Charlotte Roderick
Joe Bohlen
William W. Marion
Clarence W. Bockhop
A. Discussions with IIE Representatives
(Richard Myer and Cyriac Thannikary)

1. Offshore Retirement
   b. Funds presently held by TIAA-CREF will be transferred as soon
      as stock market is more favorable, and in any case, by June.
   c. Staff soon will receive amendment on employment contracts;
      IIE requests prompt cooperation on part of all employees as
      all must get into the plan at the outset. Each participant
      will receive an explanatory book, and later a receipt from
      AIRCO on receipt of the first quarterly payment. In future
      operation, they will receive an annual statement.
   d. Until transferred to AIRCO, funds in TIAA-CREF continue to
      draw interest.
   e. IIE will investigate situations where staff members may be
      disadvantaged by plan and determine if there are ways of
      handling individual cases.
   f. General sentiment of the Directors was that there is no
      predicting how individual country tax laws may change over
      time and the centers must, for the good of all, have a satisfac-
      tory plan.
   g. Documents attesting to financial stability of AIRCO (a sub-
      sidiary of AIG) were circulated for inspection.
   h. IIE estimates that it has incurred $8,000 in additional costs
      in setting up the program and, per memo to Directors, February
      20, proposes that this amount be deducted from insurance pre-
      mium rebates. The Directors agreed.

2. Release of Reserve Funds
   a. IIE has informed centers that operating accounts are being
      credited to the extent of returnable reserve funds.
   b. All staff members have agreed to revision of their contracts,
      and the IIE-Center contracts are being revised.
   c. The new contract amendment will outline procedure for paying
      quarterly bills, i.e., each center will remit checks during the
      first 15 days of each quarter in amount of the previous quarter's
      operating cost.
3. **Revision in Insurance Coverage**
   a. IIE reported that a new provision in staff health/medical insurance coverage puts the $50 per family/year deductible clause on an accumulated basis. In other words, the $50 is only deducted once during the year.

4. **Increase in IIE Administrative Fees**
   a. Given the increases in costs of living, etc, IIE has incurred losses in center operating accounts over the past 18 months, per February 19 memo to Directors. Consequently, IIE proposed a new rate schedule for handling staff members, as follows:

   - **New Staff** - Increase from $525 to $600
   - **Old Staff** - Increase from $325 to $400

   b. The Directors approved the new rate, but IIE is to determine whether it could establish a special rate for the processing of a short-term individual.

   c. The consensus was that, in general, it was in the best interests of the Centers to use the services of IIE, wherever possible.

   d. Where possible, IIE was requested to leave tickets "open" when situating transportation for the travel of new staff members and their families.

5. **IIE Services on Publications**
   a. IIE expressed a willingness to undertake on behalf of the centers a range of services relating to publications, i.e. (1) Circulation and distribution; (2) reproduction; (3) indexing; (4) abstracting; (5) abstract journal, etc.

   b. Given the range of subject matter, range of audiences, problem of technical accuracy, difference in language requirements, and existing publication arrangements, the Directors questioned whether an appropriate service was possible or needed.

   c. As some expressed interest in a quarterly abstract journal, the Directors agreed to review these matters with their staffs and to discuss the possibilities at a later meeting.

6. **Public Relations for Centers**
   a. IIE introduced the question as to whether the Directors might be interested in having IIE organize a series of seminars in the United States to acquaint designated audiences with the work of the Centers.
b. Directors expressed the idea that the real need was to concentrate on doing work to carry out assigned missions in the developing world and to keep donors, present and prospective, informed.

c. Some Directors expressed a feeling that a public relations program, as proposed, might "backfire."

7. Purchasing Services

a. Faced with the likelihood that both Ford and Rockefeller foundations contemplated terminating purchasing services presently being performed for some Centers, the Directors discussed possible alternatives and requested IIE to study the matter and, if interested, to propose a solution.

b. IIE indicated an interest in purchasing for the Centers with one possibility being the absorbing of the unit presently operating in the Ford Foundation.

c. All of the Center Directors present indicated an interest in having a purchasing service to handle all or some of the purchases in the United States and Europe.

d. Finally, IIE was requested to submit a preliminary proposal by April 1, this to be based on a basic percentage figure for doing the work. The Directors expressed a preference for a standard procedure with known costs and minimum charges.

B. Brochure on CG and Centers
(Report by John LaHoud, Ford Foundation)

1. Editorial work is moving ahead. The brochure will have two major sections: (a) Opening section, with essay signed by World Bank, FAO, and UNDP on the need for an international network of agricultural research and training centers and how it has come about; (b) Section on each Center, with emphasis upon network aspects and relationships with national programs. Some questions are yet to be resolved with respect to level of language, how some of the recently established Centers are to be treated, and the types of photos to be used.

2. The present schedule is to furnish drafts to the Directors by mid-April with the final manuscript to be ready for review at International Centers' Week in late July.

3. Distribution plans are being developed by the UNDP, while each Center will be able to purchase quantities for its own use and distribution. Production costs will be met through the CG and the sales to the centers.
4. Irene Uribe has been contracted to write the section on the Centers. (Subsequently, she arrived and was able to interview each Director about what he believed important to include in the brochure).

C. Overhead Charges

1. Discussion centered on the need for uniform formulas for distributing administrative overhead charges related to restricted core and special project grants. With respect to restricted core, the consensus was that a donor who chooses to buy a specific part of a research program should pay an appropriate part of the administrative costs.

2. As CIIMFT has had more experience with the different kind of grants involved, Hanson was requested to circulate a document to the other centers so that each center may determine how well the formulas and procedures would work in the specific case. (At this meeting, Hanson distributed two papers prepared in 1973 for the Executive and Finance Committee of the CIIMFT Board. These outline and discuss the procedures being followed at that time by CIIMFT.)

3. Issues specifically identified included: Agreement on definitions and procedures; whether to distribute cost of research support services (experimental farm, central laboratory services, publications, etc.); how to classify training grants, and an arbitrary way to determine rate on grants that have no personnel costs.

4. Directors expected to be able to reconcile their ideas and reach final agreement by the next meeting.

D. Next Meeting of Center Directors

1. Because of the problems of meeting between sessions during Centers' Week, the Directors decided to hold a two-day meeting at Washington, D.C., immediately ahead of Centers' Week, Friday and Saturday, July 26 and 27.

2. Byrnes was requested to prepare a preliminary agenda for this meeting, with one day to be on administrative issues and the other on training.

3. Later in the week, the Directors outlined briefly some of the training issues which concern them, as follows: (a) what the results of followup studies of training programs indicate; (b) to what extent are centers presently using the "apprentice" system for training research people (as followed by IRRI), and with what effect; (c) how practical or successful are "train the trainer" type programs in terms of effects within national programs; (d) to what extent can centers help national training efforts by supplying instructors or other resources; (e) what are the most effective ways by which centers can or should participate in the training of doctoral candidates; (f) should centers
be encouraging the training of more doctoral students for the
developing countries; (g) where and how can centers be most
effective in training production specialists; (h) how can centers
be more effective in followup on former trainers; (i) how much
of the core budget should be allocated to support of trainees.

4. The Directors questioned whether it would be necessary to bring
their training people to this meeting and will reserve final judg-
ment after there is opportunity to review the proposed agenda for
the meeting.

5. Byrnes will prepare, in addition, a summary on the forthcoming
Rockefeller Foundation conference on agricultural education and
training at Bellagio, March 11-15.

E. Outreach Grants

1. Nickel presented a draft of a working document within IITA which
outlines the nature and concept of outreach programs, establishes
criteria for IITA acceptance of such activities, outlines the
standard professional personnel policies for such, and lists the
ways in which the specific host government will participate in the
carrying out of the agreed upon activities.

2. Discussion emphasized the importance of the various Centers keeping
each other informed on what they are doing and planning to under-
take in outreach, as well as the desirability of having some uni-
formity with respect to basic administrative issues.

3. Among the issues they identified (a) Relationships between out-
reach and home staff perquisites, and (b) how to provide profes-
sional development opportunities for long-term employees.

4. A committee consisting of Hanson, Athwal, and Nickel was selected,
this committee to bring a basic document before the Directors at
the meeting July 26.

F. Coordination Among Centers on Administration of Senior Staff

1. The procedural and policy issues discussed here included (a) when
one center wishes to offer a position to a staff member of another
center; (b) when one center requests a staff member of another
center to participate in a specific activity (i.e., conference,
field trip, program evaluation, etc.); (c) when one center invites
a staff member of another center to attend a conference or similar
activity.
2. Recognizing the difficulty of establishing and administering hard and fast rules, the Directors agreed on the following principles:

(a) **On employment offers**: These to be handled first at the administrative level.

(b) **On requests for participation**: While these might best be handled first at the administrative level, at least the Directors of the Centers involved should receive copies of any such requests or invitations. (As discussed at Bellagio, the requesting Center would be expected to provide the transportation and per diem unless the directors mutually agree that the staff member's participation is directly related to his program.)

(c) **On invitations to participate**: These normally would be handled as above, with the staff member's own Center bearing the transportation and per diem costs.

G. Scheduling and Receipt of Funds

1. Several Centers reported problems associated with delays in receiving from donors pledged amounts early enough in the year to provide a regular cash flow, and other delays, at the end of the year, in which final payments are received too late to apply against expenditures in the year intended.

2. Some Centers have experienced problems in using in the subsequent year such unexpended funds carried over.

3. Another problem mentioned was associated with the CG Secretariat's unintentional listing of certain restricted core funds as special project funds, and vice versa.

4. Further discussion led to the conclusion that the Directors should present to the CG a document outlining the problems of cash flow, late deposits, and related issues. This would be done with the expectation that the CG, if aware of the problems and needs, might take appropriate action. Albrecht was requested to draft such a document for later consideration by the Directors.

5. Subsequent discussion pointed up the possibility that much of the problem might be alleviated through the Consultative Group providing working capital to cover 40 working days operational expenses.

In the event that this does not resolve the problem for some Centers, it was agreed to review the matter at the July 26-27 meeting and, if necessary, present appropriate recommendations to the Secretariat of the Consultative Group.
Some of the aspects of this problem were addressed in the document, "Budgeting and Accounting Procedures and Practices of International Agricultural Research Centers," June 18, 1973, as follows:

"Actual cash transfers from donors frequently lag substantially behind commitments, and often do not take place until a center is well into its operating year. In order to deal with this problem, the directors recommend that the 1974 budget proposals include a one-time provision for working capital equal to 40 days' average cash requirements."

H. Letter from John Hannah

1. A letter addressed to the Center Directors from John Hannah, recently retired administrator of the U.S. Agency for International Development, was distributed. In this letter, Dr. Hannah explained his present mission to visit, as requested by the new administrator of AID, all of the present centers to become acquainted with the purposes, activities and problems of these centers.

2. Attached to the letter was a series of questions which Dr. Hannah said indicated some of his preoccupations with the world food and population problems and the important role of the centers toward finding solutions to the food problems.

3. After considerable discussion, the Directors agreed that each Center would respond to the questions in light of its own objectives, programs and problems.

I. Income Tax for U.S. Citizens Employed by Centers

1. Nickel presented a working paper which outlined two aspects of the income tax issue as related to U.S. citizens employed by Centers. One of these was the possible loss of the present exemption which U.S. citizens residing and working abroad receive under current tax laws. The other relates to the erosion of the exemption by the defining as taxable income a number of perquisites and allowances which are not interpreted as reportable income for U.S. government employees living overseas who do not have the basic exemption.

2. If the Congress and the Internal Revenue Service should lower or eliminate the exemption, the costs of hiring U.S. citizens at international centers, already high, would increase considerably and gradually eliminate U.S. citizens from a competitive position in recruitment.

3. Inasmuch as the loss of the exemption does not appear to be an immediate threat, the consensus of the Directors was to let the matter alone for the time being but to keep abreast of developments through contacts already established with members of the Congressional staff.
1. Two representatives of the firm, P. S. Ross and Partners, contracted by IDRC to assist Centers on matters relating to internal accounting and record systems and associated equipment, were present. They, Alisdair P. Bogie and Robert L. Cummings, Jr., explained how their work was being carried out in three phases: (a) Determining the requirements of the donor agencies for information from the Centers; (b) spending up to a week in each center looking into the specific operations on financial management, as well as other needs for calculator or computer assistance, and (c) writing recommendations.

2. With respect to financial accounting, they said their discussions at each Center would include: (a) requirements of the operating departments as well as accounting; (b) external reporting needs; (c) implications of the CG practices; (d) the budgeting process; (e) purchasing and payroll procedures; (f) implications of anticipated growth, and (g) opportunities for appropriate mechanization.

3. With respect to computers, their work concentrates on: (a) determining requirements for such services by accounting, statisticians, germplasm maintenance, and library-information systems; (b) talks with equipment suppliers in the area as well as with computer resources available, and (c) identification of skilled persons in the area available to supply services.

4. The consultants responded to a number of specific questions posed by the Directors, and much discussion centered on the problems of getting adequate local service and maintenance of equipment.

5. They said their report would be ready before Centers' Week. They indicated they would emphasize the "options open approach" for the various Centers. This would include consideration of some mechanization of accounting systems and some data processing needs. Taken together, these needs might presently be best met in some Centers by one of the new mini-computers, such as the Hewlett-Packard. The next step for some would be to lease time on larger equipment.

6. One Director suggested that their considerations include how supply inventories might also be mechanized.

K. Increasing Efficiency of Center Libraries

1. The Center Directors invited Dr. Dorothy Parker, former agricultural library specialist for the Rockefeller Foundation, and Dr. Fernando Monge, CIAT librarian, to discuss ways by which Center library operations might be made more effective and efficient.
2. Dr. Parker reviewed the situation briefly, as follows: (a) The volume of technical literature in agriculture is increasing rapidly; (b) libraries are faced with making this volume known and available and to do so currently and economically; (c) in many fields, libraries are working together to share the workload and costs through developing networks; (d) no one center is able to collect everything; (e) there is a need to acquire materials not easily found in the open market, frequently in mimeo or multilith form.

3. With this background, she outlined some of the related issues: (a) Need for specialization in subject matter; (b) need that scientists and others have for access to specialized collections; (c) how to maintain a minimum collection and yet provide maximum service. These points, she said, suggest the need to bring librarians together to develop ways to cooperate and exchange material. Some libraries are making special bibliographies which are not being circulated. There is a need to share documentation techniques. With growing use of computers to take over repetitive tasks in libraries, compatible terminologies are needed.

4. Monge described the AGRIS system being developed under FAO auspices and indicated that Center libraries are logical No. 2 type operations under that system.

5. Following a general discussion, the Directors agreed that Drs. Parker and Monge should take the leadership in organizing a sharply-focused meeting of Center librarians, this meeting to be held at one of the Centers. As three Centers, IRRI, ILCA and CIAT, had extended invitations, the Directors selected one on the basis of a drawing. CIAT was drawn and will be host to the meeting.

6. Later in the week, the Directors approved the agenda and proposal for the meeting of librarians and asked Grant to write each Center Director with respect to the details of the meeting, August 5-9, 1974. Following this, Monge was to correspond directly with the librarians of each Center with respect to the materials they were to prepare and bring to the meeting.

7. The purpose of the meeting, as outlined in the proposals, is to assist the librarians of the various Centers to achieve a mutual understanding of the objectives of Center libraries; to analyze their common problems and to seek possible solutions for these, and to adopt informal cooperative efforts which should assist each Center at little or no added cost.

L. Linkages Between an International Center, National Programs, Regional Services, and Other Centers

1. CIMMYT had accepted the responsibility for this presentation and
discussion, with Ernest Sprague and Glenn Anderson joining Hanson in the presentation. Hanson traced the development of CIMMYT's outreach activities since 1966, beginning with programs in South Asia. Presently, CIMMYT's wheat and corn programs are dealing directly with 15 countries each, but the potential is 50 countries by the end of the decade.

2. Believing that CIMMYT can not cope with the demand from its central headquarters, Hanson suggested that one possible way is to re-examine regional networks and determine if mechanisms can be developed to meet some of the present and most of the projected future needs.

3. He outlined the regional services needed as being (a) germplasm distribution; (b) regional consultation from a resident scientist; (c) training, which requires a resident staff (most of this in country programs for production agronomists with occasional regional workshops); (d) regional travel grants for national scientists; (e) regional newsletter, and (f) fellowships for academic training.

4. Hanson mentioned there are a number of ways to provide and finance the needed services. He estimated a two-man staff in a region would cost $150,000 a year without fellowships. This would not entail any research operation, but possibly some seed increase activities. He outlined a need for two men per area for six regions, per commodity (one a production consultant, the other an agronomist-trainer).

5. Among the problems and issues observed were these: (a) what kind of work do you give the regionally based scientist in order that he has a professional challenge; (b) with many common donors, how might centers work together in a country to achieve greater efficiency in use of funds; (c) how much research activity is required in a regional program; (d) should the training in the region be done in a regional center or within national programs; (e) can we expect money will be available indefinitely to finance programs in a country; (f) with increasing demands for personnel in outreach programs, how can this personnel be identified and developed.

6. Sprague described the principal objectives of a resident program at a center as being: (a) to help nationals generate the technology needed; (b) to train nationals; (c) to provide consulting. None of this can be effective, he said, without a thorough understanding of national problems. The key issues are (a) getting germplasm properly used in national programs, (f) most do not know how to do this; most have been trained in hybrids and not in producing a variety for production. Breeders must be encouraged to get their material off the experiment station and into regional farm trials).
7. Sprague stressed the importance of training in order to develop people to cope with problems of the future. The training at CIMMYT is based on direct involvement with the crop for one full season. Trainees manage trials appropriate for an experiment station, and also design and carry out farm trials and demonstrations. They receive about the equivalent of one university quarter in the basic supporting disciplines, i.e., agronomy, entomology, pathology, etc. Other training approaches include visiting scientists from national programs who serve for one year on the CIMMYT staff, post doctoral appointees who have a specific area of program and some training responsibilities, and graduate students (both doctoral and masters candidates). The training of the latter is limited to their doing of thesis research at CIMMYT.

8. He suggested that a possible workable approach to a regional coordination program would be the basing of a two-man team in a country that already has a good program. They would need travel funds, not only for themselves but to sponsor travel of some of the nationals in the region.

9. Anderson commented on some of the other problems associated with stimulating production and productivity in national programs. There is a need, he said, to seek ways to make growing the product more economically attractive in some countries. He observed that training-of-trainers has not worked too well, and recommended that if regional training people are made available they should assist with in-country training programs. He also noted that increasing the number of thesis students at headquarters unduly burdens the scientific staff.

10. Among the questions which should be raised in considering programs in a country, Anderson listed: (a) is the government interested in promoting the crop; (b) is it willing to invest some of its own funds; (c) what is the staff situation and will it be best to train some people first or do you start by providing expatriate staff; (d) what are the government's priorities among crops.

11. The ensuing discussion raised the following points: (a) why are the Centers not more successful in getting their messages across to national leaders; (b) how to correct the misperception among some donor agencies that activities by Centers away from headquarters is keeping people away from doing needed research; (c) how to keep Centers from becoming involved in a country in straight technical assistance which may be peripheral to the major objectives; (d) how to develop ways to advise governments on food crop production rather than pushing a single crop; (e) how to develop knowledge of the varietal needs of farmers so that new materials will fit into their food production systems; (f) the need for standard operating procedures with respect to one Center sending selected materials to another Center which has an interest also in the specific crop.
M. World Fertilizer Situation

1. Upon invitation of the Center Directors, Dr. Donald McCune, director, National Fertilizer Development Center, presented a seminar on the world fertilizer situation and participated in several hours of discussion with the Directors on the implications of the presented and projected outlook.

2. Dr. McCune will circulate to the Directors in early April a detailed publication prepared for USAID by TVA: "World Fertilizer Market Review and Outlook," TA (QA) 6-69. Some notes on McCune's seminar and discussion, as prepared by Haldore Hanson, are attached to these minutes.

N. Experiences with Agricultural Development Projects

1. Upon invitation of the Center Directors, Dr. Montague Yudelman, director, Agriculture and Rural Development Department, International Bank for Reconstruction and Development, presented a seminar in which he reviewed the experiences of the World Bank and regional banks with agricultural development projects. Following the seminar, he and Dr. McCune joined the Directors in a comprehensive discussion of the agricultural development problems, particularly as they involve small farms and technology based on fertilizer use. Directors of several Centers outlined their activities and concerns in these areas.

2. Albrecht indicated that IITA's work in Africa is focused principally on small farms of the forested, lowland, humid tropics. IITA is not waiting for the development of a complete package of technology but is moving out new technology as it becomes available and is tested. He pointed out that one of the dangers of small farm research is that it may easily become too localized, sometimes neglecting problems of more widespread importance.

3. Nickel added that IITA is trying to develop scale neutral technology, with emphasis upon developing resistance to insects and diseases. He believes that such approaches can make for dramatic improvements as well as can varieties responsive to fertilizer. Through outreach programs, IITA expects to test the new technology on small farms in a variety of environments.

4. Yudelman stressed the great untapped potential in rural areas for increasing food production. Unless we raise the productivity of small farmers, he said, 800 million people who live on small farms will not get enough to eat.

5. Albrecht pointed out that the critical food shortages at the moment in Africa are mainly with the poor people in the cities.
6. After Brady had introduced the view that the small farmers in Asia are rice farmers, Hanson said that he believed too many people were looking at the wrong unit or variable in their concern for size. The critical difference, he said, is irrigated vs. non-irrigated land, and a move to be concerned about upland rice is a significant step.

7. Yudelman raised the disturbing question: What do you do when the resource base is so bad that you don't know what to do? Given that population will continue to grow in rural areas, he raised these issues: (a) Given the present scarcity of nitrogen, does this mean a difference in future research direction; (b) by putting emphasis on work for small farmers, does this complicate the food problem of the future; (c) what should our position be with respect to feeding grain to livestock in the United States; (d) while demand for meat increases as incomes go up, production of beef has not shown any appreciable increase in efficiency as has occurred in other animal products.

8. Commenting on these points, Pagot suggested that tropical feedlot research should aim at using by-products of the agricultural industries, and that there is a possibility of feeding grass in feedlots.

9. Relations with Consultative Group

1. In his role as a representative of the World Bank, Yudelman invited comments from the Directors with respect to relationships with the CG and its secretariat.

2. Directors agreed that the work of the secretariat had been 95 percent successful, although there had been some problems with respect to establishing relationships initially with new donors. The process of standardizing the budget process was an irritation, but no one was hurt in the process.

3. Some Directors felt the issue of program and Center reviews had not yet been completely resolved or clarified, although all expressed appreciation for the value of visits from the CG, donors, and the secretariat inasmuch as these afford opportunity to become acquainted with program and budget needs.

4. Pagot indicated that it had been the TAC policy to endorse a comprehensive evaluation for each commodity every 5 years. Brady indicated that communication among the relevant parties has been good, and he has suggested that a TAC representative participate in the annual program reviews at IRRI.
5. Yudelman asked for suggestions on how to make Centers' Week more productive. No concrete proposals were set forth other than some attention be given to reduce the number of events occurring simultaneously. Generally, Directors felt that Centers' Week provided an excellent opportunity for them to tell their story as well as to become better acquainted with present and future donors. To reduce the pressures on conflicts, as noted elsewhere, the Directors decided to hold a meeting of their own for two days preceding Centers' Week.

6. Thanking the Directors for the opportunity to discuss with them so many important issues, Yudelman said that while opportunities for expansion will be curtailed in the future the World Bank will not let the Centers down.

P. Inter-Center Responsibilities: RICE

1. This discussion explored the issues associated with inter-center relationships with respect to research and training activities at one center on a crop for which another center had primary responsibility. Brady and Albrecht agreed that the present formal agreement between IRRI and IITA with respect to IITA's involvement in lowland rice activities in Africa was working satisfactorily. Brady pointed out, however, that some African countries had raised questions as to why IRRI is not working on upland rice in Africa. Albrecht stressed the point that there must be liaison among centers even if a particular center is not directly involved in a specific crop so that coordination is not perceived as duplication.

2. Grant outlined that Latin America interests in rice were in three areas:

   a. Lowland, where the cooperative work with IRRI has been significant and should be continued, although production is among a few relatively large farmers.

   b. Upland, representing 70 percent of the Latin American rice production. CIAT has done little work on upland rice and has looked to IRRI for over all leadership in rice.

   c. Adaptation of Asian rice production systems to poorly drained and flooded areas of Latin America. He believed CIAT's role in this should be limited to pilot and demonstrational involvement.

3. Brady outlined the expanding program in upland rice research at IRRI, but indicated that IRRI would not rate additional test locations as a high priority item, except where the production potential would justify.
4. Athwal said upland rice poses a difficult challenge. IRRI's upland program at Los Banos will have some relevance to Latin America and Africa. When IRRI has some results, the next step will be to determine the adaptability. He indicated that a regional program grafted onto the national program of Brazil would be useful, but that it would be difficult for IRRI to manage such an activity without the collaboration of CIAT.

5. Sawyer raised the question as to what principles are involved when a request arises for assistance on a crop, or a donor offers to finance work on a crop in a specific country. Brady replied as follows: (a) Neither center involved goes ahead without discussing the activity with the other; (b) the centers explore ways to work together, determine what is desirable, and clearly specify details; (c) if on upland rice, probably this could be best handled on a project basis out of IRRI. (Reference was made here to the IRRI document: IRRI's International Program--A Review and Future Outlook, included in appendix.)

6. Further discussion identified some of the differences in upland rice problems on the three continents, i.e., weed control is not a problem in Brazil, while this is the major problem in Africa. This underscored the point that a good upland rice technology in one area may not fit in another, thus the need for regional activities. Brady indicated that soil problems are maximized under upland conditions, but varieties screened for iron tolerance at IRRI would continue to be so elsewhere.

7. With respect to taking initiative and responsibility, two opinions arose—that the center with major responsibility for the crop take the initiative, the opposing viewpoint being the center most geographically close to the problem.

A principle emerged out of the discussion on which the Directors agreed: Centers must establish their own credibility in various parts of the world and particularly on the continent where they are located. Centers need to help governments develop perspectives on how to deal with and through centers. Building and maintaining regional credibility is a key issue for each center.

8. After the general session adjourned, IRRI and CIAT representatives discussed how the rice development needs of Latin America might best be met. The group agreed on the following procedure: (a) Jennings to prepare an analysis of the rice situation in Latin America, why it is an important research area, and suggesting the kind of program that should be undertaken without regard to who does it; (b) in this or a separate paper, a possible operational plan to be outlined in which IRRI would assume core responsibilities for rice in Latin America but would carry these out through appropriate arrangements with CIAT and relevant national programs, and (c) these proposals to be submitted to the IRRI and CIAT boards for informal discussions at an early date.
Q. Inter-Center Responsibilities: MAIZE

1. Representatives of CIMMYT and CIAT considered how the maize research, development and training needs of South America might be more effectively met. Presently, CIAT operates a regional maize program in the five Andean countries, Colombia, Venezuela, Ecuador, Peru and Bolivia, through which materials originating at CIMMYT and elsewhere are tested in variety of environments. In addition, the CIAT maize staff carries out certain research activities related to reducing corn height, photoperiodism, and insect and disease resistance.

2. Questions have arisen within and outside of CIAT board and management with respect to the magnitude and direction of CIAT's maize program. Further, CIAT has received requests to extend its maize activities into some other areas of South America, particularly the tropical areas of Brazil. Grant said CIAT was faced with defining its priorities among commodities, particularly with respect to core funds and staff. Consequently, there were pressures to discontinue work on maize while at the same time it was one of the principal crops in the region and a basic part of the farming systems.

3. A committee consisting of Sprague, Francis and Alvarez-Luna outlined a collaborative program between CIAT and CIMMYT whereby CIAT's work in the Andean zone would be strengthened and, at the same time, expanded in area to include Equatorial Brazil. This proposed working agreement will be submitted to the respective boards for informal discussion.

R. Meeting at IITA in 1975

1. The Directors agreed to meet for 4 or 5 days in 1975 at IITA, selecting the dates for February 23 (arrival) with the sessions to begin on February 24.

2. It was generally agreed that programming would emphasize topics of interest in general principles to all centers. Topics proposed included: (a) Review of world food stocks and prices combined with review of world food protein situation; (b) constraints to adoption of new technology and constraints on yields in farmers' fields; (c) land utilization issues and alternatives; (d) unconventional systems of nitrogen fixation and other fertilizer sources; (e) invite Maurice Strong to report on ways the new UN Environmental Program may relate to the work of the Centers; (f) review of grain legume research at various Centers; (g) topics which may grow out of actions and developments within or by CG and TAC; (h) discussion of principles promoted by the Club of Rome.
S. UNDP-FAO Workshop on Application of Agricultural Research in Latin America

1. Byrnes outlined the developments leading up to this workshop, scheduled for April 26-May 2, and reviewed the proposed program. Participating centers will be CIP, CIMMYT, CIAT, ICRISAT, and CATIE (Centro Agrícola Tropical de Investigación y Enseñanza). Participating agencies will include FAO, UNDP, IBRD, BID, and IICA.

2. At the request of CIP and CIMMYT, the presentation of these Centers will be moved as late in the week as possible.

T. Evaluation of Protein Quantity and Quality

1. Dr. Charles Francis, CIAT maize breeder, and Dr. Alberto Pradilla, pediatrician at the University of the Valley who had just completed a year's sabbatical leave at CIAT, reported briefly on their efforts to evaluate biologically protein quantity and quality in foods, particularly corn. They reported on laboratory analyses, as well as trials with small animals, swine, and humans.

2. Urging the Directors to consider the total food consumption patterns of people, Pradilla said we must treat malnutrition as a symptom of many things which are wrong in a community. He emphasized that data from human evaluation studies provide dramatic evidence to convince national leaders of appropriate courses of action.

3. Discussion centered on the ideas that (a) man depends upon a mixed diet; (b) there is a need to assess alternatives in terms of nutrition and production potentials, and (c) Centers need to be concerned about the total food production program in a country.

4. Francis outlined how Centers can make a unique contribution by stimulating cooperative efforts among national programs in agriculture, health, education, and medicine, as well as with seed producers, food processors, and marketing agencies.

5. While Directors raised the question "What is lacking in the agricultural scientists' understanding of what must be done to meet food needs?", no concrete answer emerged from the discussion.

U. Other Administrative Matters

1. The question of shifting the fiscal year basis of Center operations was raised, but there was no consensus for change.
2. Directors expressed concern for having available better data on changes in cost of living, as well as the influence of fluctuations of the dollar and local currency on the salaries of both international and local staff. There is a need to have a regular system of evaluating what is going on.

3. A related issue was the differences in ways donor payments are made. Some donors make pledges in dollars, and some in their own currency. This has an adverse effect on the budgets of some centers. Some donors pledge at a plateau of dollars, same level, year after year, and their contributions buy proportionately less each year.

4. Also there are variations in what a dollar will buy in various countries as a function of devaluation and rising costs.

5. Clarification is needed on the appropriate channels for requests for written reports originating with donor agencies, CG, TAC, FAO, or other international bodies. On occasions, such requests have gone directly from an international agency to a staff member of a Center working in the field away from headquarters.

6. There is a growing problem of coordinating and scheduling conferences involving staff members of the various Centers. The schedule being circulated by the CG secretariat helps but is not comprehensive enough, nor cast far enough into the future, to facilitate planning. Directors agreed to consider this matter further at the July meeting.

V. Meeting with World Food Institute Representatives

1. Four representatives of the World Food Institute, Iowa State University, were visiting CIAT during the week of the meeting of Center Directors, and the two groups had a luncheon meeting.

2. Members of the group outlined the activities and interests of Iowa State University in cooperating in the work of the centers, and announced plans for the World Food Conference of 1976. This will be held at Iowa State University, June 27-July 1, 1976, the theme being "The Role of the Professional in Feeding Mankind." Additional information is available from Dr. William W. Marion, Chairman, World Food Conference, 201 Kildee Hall, Iowa State University, Ames, Iowa, 50010. Telephone: 515 294-2570. Dr. W. F. Wedin is director of the World Food Institute.
Notes on world fertilizer situation, and its impact upon the work of the international centers

(These notes are based partly on a seminar at Cali, Colombia, led by Dr. Don McCune of TVA, on March 4, 1974; partly on a discussion at Cali among the Directors of international centers, on March 5; and partly on a seminar at the CIMMYT annual Trustees meeting, led by Dr. McCune in Mexico on April 1, 1974. Haldore Hanson).

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Biodata: Rockefeller Foundation agricultural staff in Chile, 1957-62. Since 1962, with TVA.

The fertilizer outlook as seen by TVA.

In 1973 the price of nitrogen and phosphate fertilizers doubled, and even tripled in some parts of the world. Some fertilizer importing countries like India have not been able to fill their fertilizer orders in 1974.

The significance is obvious. The recent agricultural revolution was built upon new varieties of wheat and rice which are more efficient in their use of fertilizer to produce grain. But without the fertilizer, they are not much better than traditional varieties.

One million tons of nitrogen fertilizer, nutrient weight, will produce an additional ten million tons of grain, if properly applied to the new varieties. Therefore for each million tons of shortfall in fertilizer this year, there will be a drop in production of ten million tons of grain.

The fertilizer outlook is a very important factor to the international centers. They need answers to three basic questions: How long will the present fertilizer shortage last? Will the present high prices come down?
Should there be a change in recommended technology which now is dependent upon chemical fertilizers?

Answers will be suggested to these questions, based upon information at TVA. TVA has a major research organization for fertilizer products and for design of fertilizer factories. TVA has served as consultant on fertilizer to 30 foreign governments. TVA publishes a World Fertilizer Market Review, and the latest review is being issued in March, 1974. 1/ The FAO, the World Bank, and other international institutions look to TVA and its Fertilizer Review as an important source of information about future markets for fertilizer.

The fertilizer crisis of 1973-74 grew out of a series of events spread over the last decade:

First, the fertilizer industry is a cyclical industry, a boom-and-bust industry, like agriculture itself. A period of over-expansion in the world-wide industry occurred in the mid-1960s, and about 1968 there was a substantial drop in prices. The industry reacted by building almost no new factories for five years starting in 1968, and some old factories were closed.

Next, widespread drought occurred in 1972, causing a slight drop in world food production, actually a drop of only 4% in world cereals. But this small change brought violent reaction in world grain trade. The price of wheat and corn doubled, and the price of rice and soybeans tripled.

Third, governments were forced to draw down their food stocks in the 1972 drought. Naturally, they sought to rebuild their supplies by importing more fertilizers. At the same time, farmers in the exporting countries, like the U.S.A. and Canada, also sought to take advantage of high grain prices by buying more fertilizer. This pushed the demand for fertilizer in 1973 to an historic peak, beyond the capacity of the industry. So prices of fertilizer products doubled and tripled.

Now what is the outlook?

In the short run, TVA estimates that a fertilizer shortage will continue until enough new factories are built to meet the demand. The shortage of phosphate fertilizers is expected to continue two more years, to 1976; the shortage of nitrogen fertilizers to continue four more years to 1978.

Meanwhile, some 30 or 40 new factories, mostly for urea, are under construction during 1974-78, or under negotiation, to operate in Canada, the Caribbean, the Persian Gulf, Eastern Europe, the Soviet Union, China, and Indonesia. As these new factories come on stream, the shortage of fertilizer will diminish and eventually disappear. The next four years will be a period of privation, but the end of the present shortage is in sight.

The outlook for prices is not so good. TVA does not anticipate fertilizer prices will ever again return to levels that existed before 1972, because the industry is drawing upon more expensive raw materials, more expensive labor, and will operate in some developing countries where efficiency of operation will not be as high. No one likes to predict future prices, but we may be safe to plan on prices 50% higher than those before 1972.

And what is the outlook beyond 1980?

There should be no shortage of raw materials for nitrogen, phosphate or potash fertilizer. The world is still flaring (or destroying) more natural gas at the well head than it is using in the entire nitrogen industry. Raw materials for phosphate and potash are plentiful but new mines will need to be developed.

It is quite possible that expansion of the fertilizer industry during the 1970s will produce another glut by 1978, similar to the glut of 1968.

Looking farther ahead, TVA sees no reason why the fertilizer industry cannot increase its product as rapidly as agriculture demands it, up to the end of this century and further. If population doubles, and food production doubles, the fertilizer industry can also double, or more than double. The strategy of food production can continue to rely upon chemical fertilizer to 2000 A.D., and beyond.

But there is one caution: the economics of fertilizer has changed, perhaps permanently. Prices will remain higher than in the 1960s. National
programs must reassess the recommended levels of fertilizer. And international research centers must help in the testing of efficient fertilizer products, and more efficient fertilizer practices, to enable farmers to get the most out of higher-cost fertilizer.

Impact of the fertilizer situation on the research and outreach programs of international centers.

(1) Farmers are now wasting a large part of the nitrogen fertilizer they apply.

For example, in the temperate zone, food crops now take up only 50% of the nitrogen applied in the form of fertilizer. The other 50% is lost.

In the tropics only 25% of the nitrogen applied to food crops is taken up, and the other 75% is lost.

Much of this loss in the tropics is caused by farmers who broadcast their fertilizer, instead of turning it under.

Another waste is caused by farmers who do not control insects and diseases. Plants which are fertilized, and then damaged by insects and diseases, cannot pay for the cost of fertilizer with grain.

Lack of weed control in the tropics is another fertilizer waste. Weeds sometimes take up more fertilizer than the crop.

Problem soils can cause fertilizer waste. Zinc deficiency in the soil, for example, inhibits the uptake of nitrogen by the plants. This is correctible.

Some steps to reduce waste of chemical fertilizer are well known. Nevertheless, making these changes on the farmers' fields will require a large effort by national extension programs. If all these changes were possible, we might eliminate half the fertilizer losses; in other words, we might produce twice as much grain per kilo of fertilizer nutrients.

(2) There are new fertilizer products and new ways of applying fertilizer, which may prove useful.

For example, a pelleted fertilizer coated with sulfur is being tested in Asia. This is a slow release product which makes the nitrogen available at approximately the time that the plant is ready to take up the nutrient. Planners of this product believe it will reduce losses.

Another experimental approach is a foliar spray for nitrogen. India
is testing the application of urea as a spray on the crop leaves. Under some circumstances, this gives a greater response in grain than the same amount of urea applied to the root zone.

Both the slow-release pellet and the foliar spray require more study.

(5) Some agricultural planners advocate greater use of natural nitrogen. This could mean more legumes in the crop rotation, more composting, more use of house and barn manures on the fields. All these sources of natural nitrogen should be reassessed, in comparison with high-cost chemical fertilizer.

But the Directors expressed the belief that organic agriculture, using natural sources of nitrogen, can play only a marginal role in world-wide agriculture, and does not offer a significant alternative to chemical fertilizers.

(4) "Radical research" may produce new sources of fertility by the end of the century.

Some legumes, we know, have the capacity to form an association between their roots and soil bacteria. The bacterium transform nitrogen from the air into ammonia and nitrates in the root zone. Question: can this ability of the legume plant to feed itself be transferred to other food crops? This is beyond today's horizon.

Other plants produce some of their own food. In rice paddies, both algae and bacteria are able to fix nitrogen from the air and deposit it in the root zone of the rice plant. In sugar cane, bacterium feed upon the sugars in the roots, and in return, they deposit nitrogen products which are used to feed the sugar cane. Perhaps the strangest example is the pine tree which is able to grow in pure silica sand, with no visible nutrients, because a fungus known as mycorrhiza lives upon the pine roots and fixes nitrogen from the air.

No scientist has succeeded in domesticating these nitrogen-fixing processes and in transferring these benefits from one crop to another. This might happen by the end of the century.

To sum up:

The present shortage of fertilizer supplies will continue for two more years in phosphates; for four more years in nitrogen fertilizer. The shortage is not permanent. It is caused by insufficient factory capacity in 1973-74. That shortage of capacity is now being remedied. Through the 1980s and 1990s, there is no present reason why the fertilizer industry cannot produce as much
chemical product as agriculture demands. And there is no reason why scientists should not continue to build their strategy of food production upon chemical fertilizer.

But the economics of fertilizer has changed. Prices of fertilizer will remain high. Prices of food grain may also remain higher than in 1972. Every national program will need to reassess the level of fertilizer which it is recommending. And the international centers must help to test new chemical products, and new methods of applying chemicals, so that the national programs and the farmers can get more grain from high-priced fertilizer.

Miscellaneous notes:

USA deficit: The USA will be a net importer of nitrogen fertilizer starting in 1974. But there will be new factories constructed in Canada, Mexico, and the Caribbean which will alleviate the impact and help serve the markets formerly served by the USA.

Mainland China may construct as many as 16 new urea plants during the period 1974-78 and will thus cut back its imports of fertilizer, which will ease the world supply.

Fertilizer problems in the tropics: With new factories being constructed in the tropics, there is need for more research on fertilizer in the tropics, including new products, new factory designs, new bagging and shipping procedures, etc. This research is not now taking place, and TVA does not consider this a function of TVA.

Eighty percent of the world’s fertilizer consumption is in the temperate zone and 20% in the tropics. Therefore commercial planners do not give much attention to the tropics. There is a large loss from inappropriate products in the tropics, wet and harden product in shipment, broken bags etc. These shortcomings are now being copied into new factories for the tropics.

Phosphate fertilizer does not give the same response in the tropics, as in the temperate zone. Special research is needed.

The traditional belief that N-P-K are the three principal chemical nutrients for crops is an idea developed in the temperate zone, and may prove incorrect in the tropics. Sulphur is a widely limiting factor in tropical soils, and lime to correct low pH is another widespread need. More research is needed to establish the limiting nutrients for the tropics.
Size of plant, and cost of product: Size of fertilizer factory greatly influences the cost of resulting product.

An ammonia factory with capacity of 1000 tons a day delivers product at $50 a ton, if the price of natural gas is 60c a cubic foot. A 200 ton per day factory, using the same price of gas, will deliver product at $75 - 80 a ton.

Urea cost of product drops from $80 to $50 a ton as the capacity of the factory increases from 200 tons a day to 1000 tons a day (both using natural gas at 60c a cubic foot).

Notes on TVA fertilizer program.

The TVA Charter of the 1930s limited TVA work to the Tennessee Valley, except for fertilizer, for which TVA was given a national mandate.

TVA decided to work on research and development of fertilizer products and plants, on a national scale. This later extended to foreign countries and TVA has now served as consultant to 30 governments.

TVA tests fertilizers in the USA through land grant universities but does not have its own extension services at farm level.

Since 1965 TVA has issued a world-wide situation report on the fertilizer industry, covering factory capacity, estimates of production, estimates of world supply, forecast of world prices, intelligence service on who is building new types of future factories etc.