

**INTERNATIONAL FERTILIZER SECTION**

**SEMIANNUAL REPORT**

**OCTOBER 1981-MARCH 1982**

**FERTILIZER TECHNICAL ASSISTANCE**

**National Fertilizer Development Center**

**Tennessee Valley Authority**

**Muscle Shoals, Alabama 35660**

**April 30, 1982**

**Resources Support Services Agreement  
between the  
Agency for International Development  
and the  
Tennessee Valley Authority  
RSSA No. TVA 1 74**

## CONTENTS

	Page
I. Summary . . . . .	1
II. Technical Assistance Rendered . . . . .	2
A. Response to Urgent or Highly Technical Requests for Information . . . . .	2
B. Representation at International Conferences and Meetings. . . . .	2
C. Interagency Liaison with and Assistance to Other International Agencies. . . . .	3
D. Information and Briefing Materials for AID. . . . .	9
E. Other Technical Assistance. . . . .	11
1. Correspondence . . . . .	11
2. Technical Visitors . . . . .	11
3. Fertilizer Abstracts Service . . . . .	11
4. Foreign Travel . . . . .	12

## I. Summary

The RSSA between AID and TVA outlines several categories of assistance. Assistance rendered in each of these categories is detailed in Section II of this report and is summarized here:

- A. Response to Urgent and Highly Technical Requests for Information. Five requests were handled. One concerned TVA opinions about use of valved bags for AID fertilizer shipments. A list of AID-sponsored TVA publications was provided. Two NFDC experts were nominated for an AID policy assignment in Egypt. A shortcourse on agricultural resource development was requested by the Zaire mission. NFDC reconfirmed its interest in hosting the bilateral U.S./India Agricultural Inputs Working Group.
- B. Representation at International Conferences and Meetings. One staff member participated in the FAO/FIAC Seminar on Fertilizer Pricing Policies and Subsidies for Latin America. One staff member participated in a meeting of the Sub-Committee of the FAO/FIAC Working Party on Fertilizer Statistics. Two staff members attended the annual FAO/FIAC meetings and represented AID at the Consultation on the FAO Fertilizer Programme.
- C. Interagency Liaison with and Assistance to Other International Agencies. A U.S. Interagency Task Force received a debriefing on the 7th Session of the FAO Commission on Fertilizer. Training programs for USDA/OICD/ITD were held for three officials from Somalia, Jamaica, and Saudi Arabia. The U.S. Embassy in Guatemala was assisted with information on handling ammonium nitrate fertilizer. An officer of the International Organization for Chemical Sciences in Development was invited to NFDC. A large number of cooperative activities were carried out with the International Fertilizer Development Center.
- D. Information and Briefing Materials for AID. Regional Bureau Rural Development staff were briefed on TVA international capabilities; other activities are following toward informing AID of such available expertise. Major work was done to revise the AID Small Business Memo on Fertilizer Specifications. Two papers, three publications, and a videotape were produced as technology transfer instruments. The five-week shortcourse on Regional Agricultural Resource Development will be conducted this spring; the Tennessee Valley will be used as a laboratory.
- E. Other Technical Assistance. International Fertilizer Section staff responded to 51 and other NFDC staff to 99 letters from foreign countries. Included in the technical visitors to NFDC were 246 foreign visitors. NFDC probably will continue to prepare abstracts on published fertilizer technology, but now for inclusion in the Commonwealth Agricultural Bureaux Soils & Fertilizers publication; the TVA publication Fertilizer Abstracts was terminated with the 1981 volume.

## II. Technical Assistance Rendered

Through the Resources Support Services Agreement (RSSA No. TVA 1-74), TVA provided assistance to AID from October 1981 through March 1982 in the following ways:

### A. Response to Urgent or Highly Technical Requests for Information:

1. Mike McAllister, Commodity Procurement Section, Office of Commodity Management, AID/WA, solicited TVA opinions concerning use of valved bags for shipping fertilizer from the U.S. for AID loan or grant programs. George Hoffmeister, TVA Development Branch, was provided with a telecopy of the AID proposal and called Mr. McAllister that same day with information on TVA experience with valved bags.
2. John Malcolm, AID/S&T/AGR, called for a list of AID-sponsored TVA publications. This need had been anticipated and such a list was close enough to final form that it could be sent immediately to Dr. Malcolm.
3. On short notice, TVA nominations for an engineer and a marketing economist were provided Dr. Malcolm. The anticipated assignment was a team to Egypt to evaluate AID input there, specifically in the fertilizer field--both nominees being able to represent the U.S. viewpoint related to the evaluation.
4. The AID Mission in Zaire requested that TVA conduct a version of its training program on Regional Agricultural Resource Development in Zaire for managers from Zaire and several surrounding African countries. Our reply via USDA/OICD/ITD suggested a nucleus of such managers attend the course in the Tennessee Valley this May-June, followed by a critique to decide what should be done concerning an offering in Zaire.
5. Richard Rortvedt, USDA/OICD, called to solicit TVA availability and suggestions for meetings of Inputs Working Groups of the bilateral U.S./India Agricultural Subcommission. Tentative dates first were in April, then early June. TVA reconfirmed its willingness to participate and to host the technical inputs workshop at NFDC.

### B. Representation at International Conferences and Meetings.

1. C. B. Kresge attended the FAO/FIAC Regional Seminar on Fertilizer Pricing Policies and Subsidies for Latin America held October 19-23 in Lima, Peru. He presented a paper on "Fertilizer/Crop Price Relationships and Farmer Incentives and Income." AID supported the seminar to help insure that country participants were able to attend.

2. J. D. Bridges participated in a meeting of the Sub-Committee of the FAO/FIAC Working Party on Fertilizer Statistics held January 26-28 in Bern, Switzerland. Mr. Bridges serves as the North American representative in compiling statistics on fertilizer nutrient production, consumption, and trade. Information therefrom is used to update the TVA world fertilizer market information file.
3. Taylor Byrd, Jr., and C. B. Kresge attended the annual FAO/ FIAC meetings in Rome, Italy, during the period March 1-4. Dr. Byrd presented a paper to the Working Party on Fertilizer Marketing and Credit on the subject "Minimizing Fertilizer Losses: Role of Contemporary Marketing Systems and In-Service Training" and participated on the Technical Sub-Committee. Dr. Kresge participated in sessions of the Working Party on Economics of Fertilizer Use and the Technical Sub-Committee. At the latter he presented a proposal for improvement of fertilizer use guides in developing countries. Both served as advisors to the U.S. delegate to the 7th Consultation on the FAO Fertilizer Programme which was held on March 3.

C. Interagency Liaison with and Assistance to Other International Agencies.

1. C. B. Kresge traveled to Washington, DC, to participate in a debriefing by the U.S. Delegation to the 7th Session of the FAO Commission on Fertilizer for the U.S. Interagency Task Force. Suggestions were made for followup to certain of the commission agenda items so that the U.S. viewpoint was adequately emphasized.
2. Taylor Byrd, Jr., upon request from USDA/OICD/ITD, coordinated TVA training programs for three foreign officials:
 

Hassan M. Ali, General Manager, Ministry of Agriculture, Somalia, September 28-October 2 on "Managing Agricultural Development Programs."

Roderick O. Roach, counterpart to FAO extension expert, Ministry of Agriculture, Jamaica, November 16-December 1 on "Rural and Community Development/Conservation Extension."

Sulaiman Subaiti, Director of Government Projects, Ministry of Agriculture and Water, Saudi Arabia, March 11-12 on "Agricultural Project Development."
3. Preparations continued toward the May 24-June 25 offering of the training program TC 140-29 for USDA/OICD/ITD. This program in the Tennessee Valley on Regional Agricultural Resource Development definitely will be conducted with fully adequate enrollment expected. An attractive course brochure was produced by TVA to assist USDA in student recruitment efforts.

4. The U.S. Embassy in Guatemala called TVA requesting that a meeting at NFDC be arranged on March 22 to discuss rendering ammonium nitrate fertilizer relatively nonexplosive. Guatemala Ministries of Defense and Agriculture were concerned that insurgents would divert ammonium nitrate imported originally for agricultural purposes. Representatives of the two ministries, of Guatemalan tobacco growing companies, and of a major fertilizer bulk blending operation in Guatemala, came to NFDC and discussed the alternatives with TVA and IFDC experts. Recommendations were made to (1) blend the ammonium nitrate that has already been imported with at least 40 percent DAP which will produce a nonexplosive mixture, and (2) begin importing CAN to replace ammonium nitrate for top- or side-dressing tobacco.
5. The USDA has been attempting to solidify meeting dates for the U.S./India bilateral Agriculture Subcommittee and its inputs working groups. They are expected to meet this year in the United States. The latest proposal made to India was for the subcommittee to meet on June 8-9 to consider among other things the reports of the working groups which would meet the previous week. The fertilizer inputs group would meet at NFDC possibly on June 3-4. At the end of March confirmation of these dates by India had not been received.
6. NFDC initiated an invitation to the International Organization for Chemical Sciences in Development (IOCD) to have one of its officers visit NFDC and IFDC and present a seminar about IOCD. President G. T. Seaborg was not able to come. Secretary-General Pierre Crabbé was then invited to visit here during the period May 12-14. The local section of the American Chemical Society is interested in having Professor Crabbé address a meeting of the section during that period.
7. John J. Nortvedt, NFDC Agricultural Research Branch, was asked by FAO to review a draft manuscript on a booklet on micronutrients for use by extension personnel in less developed countries.
8. Cooperation work with the International Fertilizer Development Center (IFDC): A TVA/IFDC administrative staff meeting was held October 14. The following items were discussed: a report on the TVA fertilizer conference; an OACD in-house N inhibitor working group meeting and a joint working group meeting between TVA and IFDC planned for November 5; the FAO/FLAC Latin America seminar; the visit of ISMA meeting participants; TVA's assistance in fluid fertilizer technology; IFDC training courses including two fertilizer marketing management courses, FERITT course, FERTIMEX training course, and the granulation course; the IFDC/Mississippi State Cooperative Project; an update on the status of TVA projects including APP suspension, ACP, curtain granulation, addition of inhibitors to urea, and granulation of UP and U-UP mixtures; an update on OAU/IFDC Center for Africa; and U.S. sulfur prices and prospects for nitric phosphates.

A second TVA/IFDC administrative meeting was held January 25. The following agenda items were discussed: changes in OACD organization; status of TVA work on urea plant expansion, curtain granulation, and ammonia from coal; International Shortcourse on Agricultural Resource Development (ISCARD); FAO/FIAC meetings March 1-5 in Rome; Commonwealth Agricultural Bureaux expanded Soils & Fertilizers and TVA collaboration; NFDC fertilizer bulk-blending course for U.S. dealers; Alabama A&M international conference and followup; curtain granulation and ISCARD videotapes; review of IFDC work done for Agrico on production of TS?; fluid fertilizer training course in Mexico; IFDC publication "World Fertilizer Progress into the 1980's"; joint publication in 1983 on world fertilizer situation and outlook; IFDC contract with University of Nebraska; African fertilizer center; and technical assistance to Latin American countries.

NFDC, IFDC, and SKW Trostberg AG cosponsored a technical workshop December 4-5 in Muscle Shoals. The objectives were (1) to bring together agronomists, soil scientists, chemists, and engineers who are working with or have an interest in dicyandiamide for use with different forms of agricultural nitrogen, and (2) to survey participant experience in use of dicyandiamide as an inhibitor of nitrification in soils and to identify future research and development needs regarding its production, evaluation, and use. Participants included 14 from TVA, 10 from IFDC, 5 from SKW, 9 from other companies, and 10 from universities. C. B. Kresge attended all sessions and was rapporteur for one of the three work groups.

Interested IFDC members attended the OACD seminar November 13 on "Research, Technology, and Productivity Growth in Agriculture," presented by Bobby R. Eddleman, Mississippi State University. Dr. Eddleman is Professor and Director of IR-6, coordinating agricultural research at land-grant universities for USDA/CSRS. IFDC invited TVA to attend a seminar on December 14 by R.J.K. Myers, Principal Research Scientist, CSIRO, Brisbane, Australia. Dr. Myers' topic was "Nitrogen, Water, and Grain Sorghum."

IFDC was consulted concerning the potential effects of a U.S. House of Representative bill introduced to limit the information services performed by U.S. agencies for outside organizations. Feedback from IFDC related to the computer services TVA provides IFDC was provided by IFS for an input reply to TVA General Counsel.

The Korean Advanced Institute of Science and Technology (KAIST) inquired of TVA's Dr. Yong Kim whether NFDC had an interest in supporting work at the institute on silicate coating of urea for slow release. Since IFDC had supported earlier work, that organization was contacted concerning further interest. After certain evaluations, IFDC will make a decision and inform IFS thereof. TVA will await this decision before exploring any NFDC involvement.

Several requests by IFDC for TVA technical fertilizer information were satisfied through the IFS.

At the request of NFDC, IFDC arranged a seminar by an IFDC Board Member during the week of the IFDC Board Meeting in October. Dr. Bukar Shaib, Presidential Advisor on National Security Affairs and Chairman of the Green Revolution Committee of Nigeria spoke to NFDC and IFDC employees October 7 on "Nigerian Agriculture." Dr. McCune prefaced his introduction of Dr. Bukar Shaib by introducing other IFDC Board Members.

The TVA/IFDC joint working group on N inhibitors met November 5 at NFDC. A report on the upcoming DCD workshop was presented by Dr. Roland Hauck. Also, research progress reports were made by Dr. Yong Kim, TVA Chemical Development Division, and by Dr. Paul Vlek, IFDC Agro Economic Division.

TVA received a letter of thanks from IFDC for participation in the second Fertilizer Production Training Program at IFDC for FERTIMEX (Mexico) engineers. Fourteen TVA staff assisted through contributed lectures, consultations, and technical data in support of the program. All OACD divisions and the manager's office were represented in the participation.

The TVA/IFDC working group on N inhibitors met on March 30 to discuss preparation of PPDA fertilizer materials and other N inhibitor-fertilizer combinations and analytical problems with inhibitors, especially PPDA. Concerns and analytical procedures were shared. Informal collaboration on these matters will continue and the group will meet again when a subject of mutual concern is discerned.

Preliminary arrangements were made for tours of IFDC and NFDC facilities by participants in the "Nitrogen in Crop Production" symposium to be held in Sheffield May 25-27, 1982. The symposium is cosponsored by NFDC and the American Society of Agronomy.

Taylor Byrd, Jr. (NFDC), and Paul Stangel, Uzu Nokwanye, and Lew Williams (IFDC) met on February 11 with selected faculty members and administrators at Alabama A&M University to discuss collaborative efforts for developing African nations.

NFDC staff assisted IFDC in the development of a tentative program in fluid fertilizer training in San Fernando, Mexico. The program, scheduled for February 22-26, did not materialize.

Victor L. Sheldon assumed responsibilities as Head of the IFDC Communications Section in early January. We assisted Dr. Sheldon in making contacts in the NFDC Design Branch for special assistance in obtaining equipment drawings for IFDC publications and papers.

Chemical Development Division responded to a request from IFDC for an estimate on construction at IFDC of a curtain-granulation pilot-plant melter like the one at NFDC.

R. D. Young, Fayez Khasawneh, and Conrad Kresge met February 24 with Owen Livingston, Donald McCune, and Jerry Clemmons at IFDC concerning a proposal by TVA for IFDC to do exploratory coating work. NFDC does not have the small equipment needed to produce the "sulfur-sandwiched urea" (SSU)--coating of SCU with urea and then an outer coating of sulfur. IFDC agreed to do some preliminary testing to evaluate the effect on the first sulfur coating and to check their capability to do the work. NFDC agreed to produce a small urea melter for IFDC to assist in this work. IFDC will also use the melter for other purposes. The formal tests probably will be run in April using freshly prepared SCU base materials produced at NFDC. The urea release rate of SSU theoretically should be suitable for row crops such as corn.

IFDC invited NFDC to attend a seminar at IFDC presented by D. Mohamed Alal El-Din, Foreign Relations Department, Ministry of Agriculture, Egypt. The topic was "Bio-Fertilizer and Bio-Energy Research in Egypt." Conrad Kresge attended from NFDC.

The Division of Agricultural Development requested that IFDC Technology Division conduct a demonstration of bulk blending in its pilot plant for two offerings of a TVA bulk-blending course. IFDC conducted the demonstration at the first offering (a pilot for U.S. fertilizer dealers conducted for the field programs field staff). The second offering for the dealers never materialized when it was realized that the course was not fully developed.

#### 9. Contracts and Agreements.

TV-58058A, International Fertilizer Development Center, Muscle Shoals, Alabama. This contract provides for Stevan W. Pierce to present a paper entitled "Study Solutions to Alleviate Brazilian Phosphate Rock Dustiness" at the Centro de Estudos de Fertilizantes (CEFEL), and to consult with CEFEL concerning industrial hygiene in Sao Paulo, Brazil. The assignment will not exceed five workweeks with approximately two workweeks spent in Brazil. IFDC will pay TVA for Mr. Pierce's services to to exceed \$5,819.28. This contract was approved December 1. Late in the quarter the assignment was delayed for approximately six months.

TV-58053A, International Fertilizer Development Center, Muscle Shoals, Alabama. This contract provided the services of Darrell A. Russel to assist IFDC in writing a section on nutrient requirements and sources for the Bangladesh Policy

Study. The length of the assignment did not exceed five workdays. IFDC will pay TVA up to \$1,239.70 for Dr. Russel's services. This contract was approved November 17.

TV-58052A, United States Department of Agriculture, Washington, DC. This contract provided two weeks of training for R. O. Roach in extension and rural development. The Food and Agriculture Organization, through USDA, will reimburse TVA for a total of \$2,000 for training expenses. This contract was approved on November 5.

TV-58308A, Tuskegee Institute, Tuskegee Institute, Alabama. This personal services contract provided two days of training experience in rural and community development at Tuskegee Institute for R. O. Roach on November 30-December 1. TVA, from funds received from USDA (Contract No. TV-58052A), will reimburse Tuskegee Institute for training services not to exceed \$300. This contract became effective November 1.

TV-57943A, Israel Chemicals Limited (ICL), Tel-Aviv, Israel. This contract provides for John T. Shields to serve as guest lecturer to commemorate the Dr. Dalia Gredinger Memorial and hold discussions at other meetings involving common interests in fertilizer and agricultural research and development. His services were required from November 7-23. ICL paid for Mr. Shields' travel and living expenses. This contract was approved on November 15.

TV-58056A, International Fertilizer Development Center, Muscle Shoals, Alabama. This contract provided the services of approximately 12 TVA staff members to serve as speakers for the FERTIMEX II fertilizer production training program at IFDC during November 9-December 11. IFDC agreed to pay TVA up to \$9,500 for the services of the TVA personnel. This contract was approved November 25.

TV-56679A, International Fertilizer Development Center, Muscle Shoals, Alabama. This contract provided the services of J. Darwin Bridges to furnish IFDC with copies of computer tapes of FAO data now stored on the GE System by TVA. The duration of Mr. Bridges' assignment was not to exceed one workday. IFDC paid for Mr. Bridges' services and the associated computer services not to exceed \$444.89. This contract was approved September 16.

TV-39723A, International Fertilizer Development Center, Muscle Shoals, Alabama. This contract, concerning technical visitor flow from IFDC to TVA, was not renewed October 1. IFDC felt the two-directional flow that now exists, though still in favor of IFDC, negated the need for a one-way contract.

TV-58063A, International Fertilizer Development Center, Muscle Shoals, Alabama. This contract provides for the services of Richard Dew and/or Jerry Klaehn, TVA Office of Engineering Design and Construction, to assist IFDC in designing a new word processing center and a new snack bar area in existing facilities located within the main building at IFDC headquarters. IFDC will pay TVA up to \$5,588 for these services. The contract was approved on February 11.

TV-55682A, United States Department of Agriculture, Washington, DC. This contract provided two weeks of training for Hassan M. Ali from Somalia in the area of agricultural development. USDA reimbursed TVA for a total of \$1,200 for training expenses. The contract was approved on January 22.

TV-58065A, International Atomic Energy Agency, Vienna, Austria. This contract provides for the procurement of TVA <sup>32</sup>P tagged superphosphate for research purposes. It was approved on February 1.

TV-58068A, Instituto de Asuntos Nucleares, Bogota, Colombia. This contract provides for the procurement of <sup>32</sup>P tagged triple superphosphate in granulated and liquid forms for research purposes. It was approved on February 10.

TV-58078A, Woodland Services, MacMillan Bloedel Ltd., Nanaimo, B.C., Canada. This contract provides for the procurement of <sup>15</sup>N depleted fertilizer materials for research purposes. It was approved on March 30.

Supplement No. 8 to IFDC Contract No. IFDC-00023/75, TVA's Division of Property and Services and Natural Resource Operations. Costs estimated by TVA for maintenance of roads and grounds and security and fire protection services for IFDC totalled \$46,000 for FY 1982. This was agreed to by IFDC on January 5.

D. Information and Briefing Materials for AID.

1. It has been felt that AID is not adequately informed concerning expertise that may be made available to AID for its development programs. C. B. Kresge met with members of AID/Regional Bureau Rural Development staffs in November concerning this matter and to explain the relationship between NFDC and IFDC in fertilizer technology transfer to the less developed countries. In March, top level TVA and AID officials met to discuss the overall TVA international capability. As a followup, the TVA program offices received by the end of March a request from the TVA Washington Office to prepare statements on their international activities. These will be used to prepare a composite TVA international capability statement for use by the TVA General Manager.

2. Major work was completed by TVA chemical engineers Frank Johnson and George Hoffmeister on revision of the 1977 AID Small Business Memo concerning AID fertilizer specifications. AID/COM/CPS has decided to issue the revised publication. Major revisions include new specifications for valved bags, updating analytical methods references, and clarification of the non-nutrient deficiencies section.

3. Instruments of Fertilizer Technology Transfer.

Technical Update: Curtain-Granulation Process. This monograph (Z-129) was completed and 5000 copies were received from the printer. IFDC received copies for distribution and the remainder are being distributed by NFDC.

TVA Curtain Granulation Videotape was completed and a limited number of copies made available for distribution and use with technical visitors and training programs at NFDC and IFDC. This 16-minute audiovisual presentation and the technical update above provide an excellent team for familiarization with this important cost saving process.

Sulfur-Coated Urea Abstracts was received from the printer and distribution made via IFDC and NFDC. This publication (Y-168) contains abstracts of all published articles on sulfur-coated urea plus a listing of recent research projects on this product in the United States.

Minimizing Fertilizer Losses: Role of Contemporary Marketing Systems and In-Service Training, a paper prepared and presented by Taylor Byrd, Jr., to the FAO/FIAC Working Party on Fertilizer Marketing and Credit, March 3 in Rome, Italy.

Fertilizer/Crop Price Relationships and Farmer Incentives and Income, a paper prepared and presented by C. B. Kresge to the FAO/FIAC seminar on Fertilizer Pricing Policies and Subsidies for Latin America October 21 in Lima, Peru.

Digest of AID Sponsored TVA Publications. Work continued on this document and reached its final stages of development during the period.

4. The International Shortcourse on Agricultural Resource Development reached its final stages of development in preparation for the May 24-June 25, 1982 offering in the Tennessee Valley. This includes a comprehensive training manual on the subject. An attractive brochure was prepared and used worldwide to assist USDA/OICD/ITD in its student recruitment efforts for its TC 140-29 "Regional Agricultural Resource Development" listing. Enrollment of 25-30 participants is expected.

Work continued on refining the videotape script to be incorporated with the footage shot during the course module offering last August in North Carolina. This audiovisual presentation will be used to publicize future course offerings and to train and inform less developed country development officers about the "TVA experience" in agricultural resource development.

E. Other Technical Assistance.

1. Correspondence--During the October-December period, IFS staff responded to 20 letters from 17 different countries. In addition, other NFDC staff members prepared 45 letters to 22 different countries. During the January-March period, IFS responded to 31 letters from 19 different countries; other NFDC staff members prepared 54 letters to 22 different countries. In February, 117 letters were mailed to AID missions concerning the International Shortcourse on Agricultural Resource Development; followup letters were sent to these same missions in March. In addition, 39 letters were mailed to foreign countries and letters were sent to selected U.S. university directors of international programs concerning the shortcourse.
2. Technical Visitors--There were 147 technical visitors from 36 foreign countries during the October-December period, and 99 technical visitors from 35 foreign countries during the January-March period. About 55 percent of the visitors were from developing countries. Foreign visitors spent an average of 1.83 days at NFDC.
3. Fertilizer Abstracts Service--NFDC ceased work toward publication of its Fertilizer Abstracts at the conclusion of the 1981 calendar year and the completion of the 1981 volume. Upon request from the Commonwealth Agricultural Bureaux (CAB) an agreement was formulated between TVA and CAB under which TVA would make available to CAB its specialized services in the preparation of abstracts on fertilizer technology. CAB is a not-for-profit organization of British Commonwealth countries, which as part of its international information services program publishes a journal containing abstracts on fertilizer use and is entitled Soils & Fertilizers. CAB would publish TVA's fertilizer technology abstracts in Soils & Fertilizers and reimburse TVA for a portion of the actual direct costs incurred in preparing such abstracts. In anticipation that the contract will be approved soon, Jane Mackey, IFS, prepared and submitted 270 abstracts, some of which would be published in the June issue of Soils & Fertilizers.

4. Foreign Travel

<u>Staff member</u>	<u>Purpose of trip</u>	<u>Duration</u>	<u>Location</u>	<u>Funding agency</u>
C. W. Snipes, Jr. G. W. Norris	Presented a paper, "Better Operator Training, Plus Safer Startup Control" at the 9th Interamerican Confederation of Chemical Engineering and American Institute of Chemical Engineers Second World Conference.	Oct 4-7	Canada	TVA
F. P. Achorn	Assisted with installation of a TVA pipe-cross reactor in SUPRA's fertilizer plant in Landskrona and held consultations on liquid fertilizer technology for use in Sweden and northern Europe.	Oct 8-27	Sweden	SUPRA
C. B. Kresge	Participated in the FAO/FIAC Latin America Regional Seminar on Pricing Policies and Subsidies, and presented a paper, "Fertilizer/Crop Price Relationships and Farmer Incentives and Incomes."	Oct 15-26	Peru	AID
J. T. Shields	Presented Dr. Dalia Gredinger Memorial lecture and other lectures and consultations in Israel.	Nov 6-24	Israel	Israel Chemicals Limited
R. L. Griffith	Visited pilot- and commercial-size operations to gather information for use in TVA's project to convert wood to ethanol.	Nov 20- Dec 15	Netherlands Austria Germany Switzerland Finland England	TVA

<u>Staff member</u>	<u>Purpose of trip</u>	<u>Duration</u>	<u>Location</u>	<u>Funding agency</u>
F. P. Achorn	Visited two Japanese companies to gain information on the use of the TVA pipe-cross reactor.	Dec 1-18	Japan	TVA
J. D. Bridges	To attend meeting of the Sub-Committee of FAO/FIAC <u>ad hoc</u> Working Party on Fertilizer Statistics	Jan 23-31	Switzerland	TVA
C. B. Kresge T. Byrd, Jr.	To attend FAO/FIAC meetings and participate in sessions of working parties on economics of fertilizer use and fertilizer marketing and credit and the technical sub-committee, and to advise U.S. delegate at the 7th Consultation on the FAO Fertilizer Programme.	Feb 27- Mar 6	Italy	AID