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REVIEW AND EVALUATION

OF

THE FOLLOWING SECTION 211(d) GRANTS

Microbiology and Mineralogy of Tropical Soils - 9310129<sup>20</sup>  
The University of Hawaii - (AID/csd-2833)

Soil Resources and Biological Nitrogen Fixation - 9310127<sup>17</sup>  
Cornell University - (AID/csd-2834)

Biological Nitrogen Fixation and Tropical Soil Management - 9310130<sup>19</sup>  
North Carolina State University - (AID/csd-2835)

Development of an Agricultural Delivery System for Small Farmers in LDCs - 9310126<sup>16</sup>  
Prairie View A & M University - (AID/csd-2836)

Classification and Microbiology of Tropical Soils - 9310128<sup>17</sup>  
University of Puerto Rico (AID/csd-2857)

EVALUATION PANEL

Harold M. Jones, Agri. Develop. Officer, AFC/DR/ARD  
Chairman

Donald R. Mitchell, Agricultural Advisor, ASIA/TD/RD

James M. Blume, Consultant, (TAB)

## I. Background

The five grants under evaluation all cover the period June 30, 1976 to June 30, 1978 and all represent extensions of earlier five-year Section 211(d) grants. In contrast to the earlier grants, the work plans for the two-year extensions provide an explicit schedule of expected inputs and outputs. Four of the five grants are divided into two components: one dealing with biological nitrogen fixation, the other with some other aspect of tropical soils. The grant to Prairie View A & M University is the only one which does not contain a component addressing biological nitrogen fixation.

The five grantees, along with the University of Minnesota, are members of the Consortium on Soils of the Tropics.

## II. Evaluation Methodology

The proposals for these five grants all include provision for on-site reviews at the end of the first year. The proposals provide that the reviews utilize the work sheets and work plans developed in preparing the grant plus the annual report and any other pertinent documents. They also stipulate that emphasis be placed upon:

1. Actual and potential utilization, i.e., how the grant has been and will be used to sustain and focus a viable institutional response capability for use by LDCs, other donors and AID.
2. Additional work and funding required, if any, to complete the state-of-the-art work on designated subjects or problems in accordance with progress to date and current AID priorities.
3. Progress made by grantee toward making its institutional response capabilities in the area of international development self-sustaining at such time as the grant expires.

Plans for the evaluation were later modified to provide for a single evaluation conference participated in by representatives of all grantees rather than a series of individual on-site reviews. The conference was held at the Quality Inn Central, Arlington, Virginia, September 19-22, 1977 under the direction of Harold M. Jones, Evaluation Panel Chairman. Donald R. Mitchell, Evaluation Panel Member, participated in all of the discussions. The third member of the panel, James M. Blume, was unable to attend because of illness. However, he has had an opportunity to examine all pertinent documents and concurs in the findings of the panel set forth in this report.

All five Consortium member institutions participated in the evaluation process through the attendance of their Grant Project Directors and other faculty representatives associated with the grant-financed activity. Representatives of the sponsoring AID office (TA/AGR) also participated. In addition to providing to the Evaluation Panel information and opinions relevant to the evaluation process, the conference discussions provided opportunity for important exchanges of information among Consortium members and between them and AID.

A complete list of attendees follows:

Cornell University: Drs. M. Alexander and R. Arnold

University of Hawaii: Drs. B. Bohlool, W. Furtick and G. Uehara

N. C. State University: Drs. B. Caldwell, G. Elkan, J. Legates,  
C. McCants and J. Nicholaides

Prairie View A & M: Drs. J. Collins, E. McKenzie and F. Richards,  
and Mr. T. Harris

University of Puerto Rico: Drs. F. Beinroth, L. M. Cruz Perez and  
R. Smith

AID - TA/AGR: Drs. L. Frederick, T. Gill, J. Malcolm and D. Peterson,  
and Mr. S. Engberg; TA/PPU: T. Eliot; AA/TA, M. Belcher

### III. General Summary

While there are some differences among the grantees in performance, problems faced, and prospects for the future, the differences appear to be less important than the similarities. Therefore, an overall impression of the totality of activity carried on and planned under these five grants appears to be in order. This section proposes to present that general overview. It also attempts to present the rationale for the Evaluation Panel's recommendations, which are presented here in general form. Much more detailed comments and recommendations about the individual grants (and their separate components) as appear to be desirable will be presented in a series of appendices to this report.

Except where explicit limitations are stated in the text, the following remarks are intended to refer to both the "biological nitrogen fixation" and "soils" components of the grants.

1. Explicit Work Plans Beneficial

We noted earlier that these five grants, in contrast to an earlier pattern in Section 211(d) grants, contained work plans which provided a detailed schedule of intended inputs and outputs. We believe this specificity is highly desirable, both as a guide to grantee action and as a convenient starting place for evaluation. Both the Grant Project Officer (AID) and the Grant Project Directors (Insts.) are to be congratulated for the thoroughness and clarity of work plan preparation. We also note that the university representatives unanimously endorsed the Logical Framework as an aid to project planning.

2. Good Cooperation Among Members of the Consortium on Tropical Soils

One of the objectives of this series of grants and of the several research projects financed by AID on associated subjects is to facilitate the flow of information and assistance among the Consortium members and others, including representatives of the LDCs, who are interested in solving the problems of tropical soils. It is our judgement that this objective is being well achieved through a variety of devices: exchanges of personnel, newsletters and other written communications, publications, workshops, collaboration on research activities, etc. The grantees deserve particular commendation for their success in working non-members of the Consortium, including scientists and officials of the LDCs, into effective participation in the network.

3. Project Activities are Behind Schedule

Almost without exception, the activities planned under the respective grants are running several months behind the schedules set forth in the work plans. In one or two cases there are specific causes for part of the delay. However, the Evaluation Panel was told by the grantees that the major reason for activities being behind schedule was delay by AID in providing the initial increment of funds. Further, AID's Grant Project Officer also indicated that there is generally a lag period of about six months before a grant can be expected to reach an optimum level of operational activities. If this is true, we suggest that work plans should be amended immediately after the provision of funds, if necessary, to provide a realistic estimate of anticipated actions.

#### 4. Critical Assumptions

The critical assumptions listed in the five grants are quite similar. To the best of our knowledge none of them have been proven generally invalid, unless it is the implicit assumption that AID funding would be timely (see para 3). There is, however, one critical assumption which is explicitly stated in some of the grants and is implicit on the others, which remains to be tested. This is the assumption that LDCs will be interested in utilizing the capabilities developed through these grants and that AID and other donors will assist in generating requests for such assistance. It is too early to determine the validity of this assumption with respect to any of the nine components which make up the package of five grants. However, a year from now, in the final evaluation of these grants, it will be instructive to determine whether calls for assistance during the second year of the grants are higher than in the first year. It is our opinion that ability to estimate demand realistically is still one of the weakest links in the process of developing university resources to fill international development needs.

#### 5. Better Methods of Utilization

It occurs to us that AID might improve the utilization of university capabilities developed through these grants (or by other means) by adopting a total systems approach. This would require an active search by AID for opportunities to fit a university's findings into an on-going or planned project, or to have the university interpret the results of its activities in the context of specific future projects. For example, in the particular case of Prairie View, its pilot model for small farmer delivery systems might be tested in an AID rural development project (emphasizing either extension or production). Thus the rural development project would benefit from Prairie View's prior knowledge and contacts but there would be no need to create a separate project simply to test the Prairie View model. Specific examples of projects which might serve as test vehicles of the Prairie View model include: (1) Tanzania Village Development, (2) LeSotho Farming Systems, and (3) Ghana's "MIDAS" project.

6. Progress Made by Grantees Toward Making Institutional Response Capability Self-Sustaining

One of the items specified for emphasis in the evaluation process is an assessment of the progress made by the institutions toward development of self-sustaining response capabilities in international development. It is never easy to conclude, with a high degree of confidence, that an institution has indeed reached a point at which its response capability in a particular area is self-sustaining. Probably the only way to verify such a conclusion is by actual trial. However, it is a good deal easier to find particular cases where one can assert with some confidence that the point of self-sustaining response capability has not been reached.

It is not likely that any of the four grantees participating in the biological nitrogen fixation work will have generated self-sustaining response capability in this area by the end of the current grants. With respect to response capability in aspects of tropical soils other than biological nitrogen fixation, the situation is mixed. Two of the grantees, Puerto Rico and Prairie View, clearly will not have self-sustaining response capability when the current grants terminate. If their capabilities in these areas are likely to be needed, some kind of financial support is likely to be needed for another 5-10 years. (Note the argument in paragraph 4 for a critical examination of probable effective demand, both with respect to biological nitrogen fixation and other aspects of tropical soils.)

As for the other three grantees, it would seem to us that the only way to determine whether they have reached a self-sustaining response capability is to withdraw support, other than that which comes from field-generated requests for services. Given the fact that these three large universities will have been supported in the general area of tropical soils for seven years or more by the time the current funding expires, such a test appears timely.

7. Recommendations

- a) All of the grantees have indicated that additional time (without additional funds) will be required to complete the work specified in the original

scopes of work. (This applies to both the "biological nitrogen fixation" and "soils" components.) Puerto Rico requests an additional 12 months, Hawaii 6-12 months; the other three grantees six months each. The major reason given for the estimated shortfall in achievement during the specified two-year period is lag time after funding by AID. The Evaluation Panel considers these requests reasonable and recommends extension of the termination date of each grant as necessary to complete the original scopes of work, but in no case for more than one year.

- b) Only one grantee has requested additional funds. Puerto Rico has requested an additional \$60,000 for the specific purpose of carrying on a taxonomic workshop in Asia similar to the one carried on in 1977 in Brazil. By all accounts, the Brazil workshop was very successful. Also, we note again that Puerto Rico is somewhat further removed from a self-sustaining institutional response capability than most of the other grantees. For these reasons, it would seem to us that a request for funds for an Asian workshop is entitled to sympathetic consideration, if appropriate in the light of TA/AGR priorities. We so recommend.
- c) In the judgement of the Evaluation Panel, the general area of biological nitrogen fixation in the tropics is important enough and the prospects for progress are hopeful enough to warrant continued AID support, perhaps at a rate even higher than at present. However, we have less certainty in prescribing how the support should be apportioned and administered.

If there is one certainty about biological nitrogen fixation in the tropics, it is that the existing stock of knowledge is grossly inadequate. There is a need for verification of some of the existing data, a better understanding of the basic mechanisms of biological fixation, including the possibilities of genetic variability of plant and microorganism, and a lot of detailed work on the environmental parameters which affect fixation. It is clear that the major requirement at this stage is research.

AID supports two substantial research contracts in this area, one with the University of Florida, one with the University of Hawaii, and a number of small research grants administered by USDA. In addition, research is being carried out by some of the International Agricultural Research Centers and other investigators. This panel has neither the information nor competence to judge whether the worldwide research program in biological nitrogen fixation is adequate in terms of coverage and quality. We suggest that RAC might be asked to examine this question, unless someone has already done so.

In a situation such as this, where the world's stock of knowledge regarding biological fixation of nitrogen in the tropics is so inadequate that no one can claim to be a very capable practitioner, is it likely to be profitable to attempt to build up "response capability" through the distribution of small grants to universities who have no other substantial involvement in the area? We do not know the answer. We do believe AID should ask itself this question prior to the commitment of new funds.

The existing grants emphasize preparation of State-of-the-Art papers on various facets of biological nitrogen fixation. By the end of the current grants (extended for 6-12 months as recommended earlier) these studies will have been completed. At this juncture, we have little evidence upon which to estimate the usefulness of those products. However, it seems unlikely that support of a new generation of State-of-the-Art studies will be needed. Therefore, we recommend allowing the existing grants to expire at the end of the 6-12 months extensions we have recommended earlier. If AID decides, after examining the questions asked earlier, that further support should be extended to the development of "response capability" in biological nitrogen fixation, we recommend development of new plans and new grants or contracts.

- d) Prior investments by AID have resulted in the building up of response capabilities of the grantees, but generally utilization has not

proceeded as well. Further investments may be needed to enable grantees to utilize such response capabilities directly and pointedly within an LDC environment. Accordingly, AID should in the future take seriously only those tropical soils proposals which promise to achieve the following.

1. An assessment of effective demand of LDCs for the accumulated capacity of the grantee institutions.
2. A design for effective transfer of technology which will strengthen LDC National Systems for carrying out resource inventories, soil surveys, taxonomy, soil classification and effective soil management systems. These aims are relevant to any funding whether under 211(d) or Title XII.