

UNITED STATES GOVERNMENT

Memorandum

TO : TA/AGR, Dr. Leon Hesser
Acting Director

DATE: October 21, 1974

FROM : AA/TA, Raymond E. Kitchell *REK*
Grants Coordinator

SUBJECT: Comprehensive Review of the North Carolina
State University Tropical Soils 211(d) Grant
931-0120

Attached is the Team Report on the subject grant. Copies have also been sent to Dr. Tejpal Gill, the Grant Project Officer. Distribution, in addition to that indicated below, and follow-up action should be taken by TA/AGR in accordance with the instructions and guidelines provided in TAB Manual Order 1026.3, revised on July 25, 1974, and soon to be incorporated in the agency grant handbook.

Your personal attention is specifically invited to recommendation #1 which calls for an immediate decision - without waiting for the Hawaii and Puerto Rico reviews - in order that the considerable amount of funds still remaining in the current grant may be more effectively used to develop the desired focus and improved response capabilities needed by the LDC's, AID and other donors.

Attachment
a/s

Distribution of Report

Team Members

Other:

AA/TA, CFarrar
KLevick
ELong
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TA/PN, CFritz
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MEMORANDUM FOR: TA/AGR, Dr. Leon Hesser
Acting Director

FROM : AA/TA, Raymond E. Kitchell
Chairman, Comprehensive Review Team

SUBJECT : Report on the North Carolina State
University Tropical Soils 211(d) Grant

I. BACKGROUND

On July 25 and 26, 1974, an agency review team met with officials of North Carolina State University as required in TAB Manual Order 1026.3. The team members consisted of: Charles A. Breitenbach, LA/DR/RD; Tejpal S. Gill, TA/AGR and executive secretary of the Team; Raymond E. Kitchell, AA/TA and team chairman; Stefan Krashevski, TA/RIG; John J. Young, ASIA/TECH; and Frank Viets, Consultant and Soils Expert. Donald Plucknett, Chief of the TA/AGR Soil and Water Division, also attended the first-day sessions. The sessions were open and several soils faculty members participated in these reviews. The key NCSU participants throughout the reviews, however, were the following: Charles B. McCants, Professor and Head of the Soil Department; Jack Rigny, Dean of International Programs; and Pedro A. Sanchez, Associate Professor and Grant Program Director.

The review opened with a welcome by Dr. G. C. Legates, Dean of the School of Agriculture who spoke of NCSU's commitment to the international scene beginning with its work in the early 60's in Peru. He stressed the interest of the university as a whole in the international dimension and the State of North Carolina and gave as evidence of this, the large foreign student population on campus. In soils work, the international dimension has approached the model for the rest of the university and the feedback is becoming increasingly valuable to the university and to the state. He was followed by Dean Rigny who re-enforced these comments and discussed the evolution of a philosophy of a "universal academic program" with a worldwide perspective. The team chairman then gave a presentation on the background and present status of the 211(d) program and Dr. Plucknett talked about development in the area of soils and water in the LDCs, including AID's priorities.

BEST AVAILABLE

The rest of the morning session, which was chaired by Dr. McCants, was a general discussion touching on some of the issues to be discussed in subsequent sessions. McCants stressed the need for a university to meet its own objectives as well as AID's and that cooperative arrangements rather than procurement contracts is the only mode in which NCSU is interested. He gave great stress to the international dimension being woven into the total soils program and not being an appendage. Staff are treated exactly the same no matter what their funding source. With 55 professionals, 31 of whom are tenured, NCSU has the largest soil department in the world with 44% of the total faculty having international experience. With this base, McCants said the university would not go out of business if AID's support ceases. A great deal of time was taken by both McCants and Sanchez in explaining the center's concept which was first discussed in NCSU's annual report for FY 1974, and modified in an outline provided the team beforehand. The modified version is to get started on activity which will eventually lead to the development of the center and to shift the purpose from institution building to the application of expertise. The morning session concluded with a statement by North Carolina that its relationships with AID had been positive, that they wanted them to continue and wished to be responsive.

II. DISCUSSION OF ISSUES

In accordance with the review guidelines, issues were developed by TA/AGR and written replies were prepared by North Carolina (See attachment No. 1). As is often the case, university representatives sometimes modify their written responses as a result of interaction with the team members. The following summary of issue discussions are provided to give a flavor of such interactions and the major points discussed.

Extent of NCSU's knowledge about developing countries, especially outside of Latin America

TA/AGR had suggested that while NCSU has achieved a satisfactory level of competency in the subject technical field, there are some questions regarding the applicability of this expertise to LDC problems. Information was specifically requested on what extent faculty time is available or used for documentation of LDC problems; need for new techniques and developmental methodology for assessment; developing specific response capabilities; establishing meaningful linkages; and effective dissemination of information.

NCSU's written reply, particularly in reference to knowledge of LDC needs, is not unexpectedly, defensive. It claims first hand knowledge of all countries in the LA portion of the hemisphere except Haiti, Serra Leone, and French Guiana. The knowledge accumulated by faculty involvement is not limited to soil matters but concerns also the general problems of development. Although, admittedly, the main thrust has been toward Latin America, department faculty are by no means lacking first-hand knowledge of soil related problems in tropical Africa and Asia. One quantitative measure of knowledge about tropical soils in developing countries suggested is the number of scientific publications written. Meaningful linkages are cited with many Latin American and U.S. institutions and are defined as referring "to actual working relationships involving either joint training, research, or technical assistance programs or close consultation and collaboration." The dissemination system consists primarily of sending publications arising from their research and technical assistance contracts in LA for soils fertility evaluation and improvement and 211(d) activities to a mailing list consisting of 470 soil scientists, institutions and key administrators around the world.

Dean Rigny commented, in defense of the LA focus of 211(d) grant activities, that spreading the money too thin would not give NCSU significant results and they had hoped that the knowledge developed in the LA tropics would be generalizable. Dr. Sanchez believes that 211(d) funds have given them enough exposure to other areas of the world. McCants said he was satisfied with the regional focus, basically because one can't build up expertise by spreading it too widely and that NCSU's base must be built on the existing faculty. Moreover, the problems and conditions in the State of North Carolina are not relevant, for example, to the Mekong Delta. The LA representative on the team felt this was a good approach but reiterated the concern that North Carolina should be cognizant of the transferability of knowledge developed. There was further discussion on the need for a systems and geographic focus among the consortium membership. Sanchez cautioned that it should be a matter of emphasis rather than a narrow division of labor but said that if, for example, it was a question of oxisols, NCSU might be the best center of expertise or at least the focal point of knowledge.

NC State sees its objective as increasing expertise of staff and not to increase staff. In this context they claim to be understaffed to take on any new activities. It was also stated that they did not want to separate 211(d) from their contracts but the chairman reminded them that the objectives were different and that the 211(d) was not intended to be simply a slush fund for operational support.

There was considerable discussion on the question of competence versus expertise, North Carolina taking the position that the basic principals are applicable worldwide. North Carolina's technical focus has been concerned mostly with soil fertility areas including soil management under shifting cultivation, subsistence cropping systems, and oxisols in savannah areas. The documentation of LDC problems and policies, techniques, methodologies, etc., admittedly has not been done because they state it was not part of their charge. North Carolina can do this, however, and would be willing to do it but reiterated that AID has never made such a request to NCSU before. The ability to respond to particular demands depends to a large extent on the release time available. In this case, drawing on more than one university in the consortium could increase the depth available to AID.

There was also discussion regarding the manpower needs of the LA technical assistance contract scheduled to terminate or be extended this December. All present thought there was a potential for increased demand in the LA area but were unable to identify it in specific terms. McCants called this a critical point, i.e., how North Carolina State can make its expertise available. It feels committed but needs to work out some more suitable arrangements, such as a retainer mechanism and also a better basis for projecting workload. At this point, McCants for the first time mentioned bringing in a new, young staff member under 211(d) funding to provide release time for senior faculty.

There was an immediate understanding on the need for programmed linkages, and discussion was brief. On information dissemination, there was some question as to the level of sophistication necessarily inherent in scientific publications, and just what type of information was being exchanged, with whom and for what purpose. Also whether reliance on publications per se was enough for effective knowledge transfer.

In its original exploration of this issue, TA/ACR suggested that there is a paradox central to most of the issues: namely, on one hand, a shortage of personnel to adequately take care of the tropical soils program as evidenced by only one key man at NCSU, handling both contracts and the 211(d) grant, by lack of documentation, and by lack of time left for consultation; while on the other hand, there are unutilized 211(d) funds that were provided specifically to correct situations such as noted. Added to this is the situation of untenured staff who have been working on AID supported field programs for a number of years but who seem to have no future with NCSU and, therefore, tend to leave.

Extent of NCSU's coordination of grant activities with other consortium institutions, other contracts, etc., and the development of an appropriate division of labor

TA/ACK believe that much remains to be desired in terms of coordination among institutions as well as programs. NCSU's 211(d) activities seem to have lost their identity with their contracts to the detriment of the former.

In its written reply, North Carolina State believes that activities of interest have been closely coordinated with consortium members and, on campus, 211(d) activities are intimately merged with its contract operations in terms of a single and totally integrated program. It also rightly takes pride in the close coordination with Cornell on its soil research program but admits that "the missing link in this chain of adequately coordinated projects is a clearly defined utilization component."

There was much discussion of both the systems and the consortium approach. McCants indicated that he was not enthusiastic about continuation of past activities as evidenced by their "center" proposal and stated that both Cornell and Hawaii have much to add to North Carolina State's area of expertise. They were less certain about Puerto Rico and Prairie View. If the demands grow as projected, they will clearly exceed the capacity of any single university and the consortium approach needs to be preserved. At the same time it is evident that North Carolina has some problems with the consortium. Several times it claimed that sister universities had ignored the specialization focus in their grants. More recently, the failure of the five institutions to come up with an agreed-upon center proposal, or its equivalent, has been a bitter disappointment and NCSU believes that the consortium is now dormant. NCSU's latest proposal is an attempt to get started-on an interim basis-towards a more structured consortium approach leading to the development of an international center. Sanchez complained that the systems approach scared him if AID means the way the water institutions operate. i.e., CUSUSWASH. While there seems to be some differences of opinion between McCants and Sanchez, on this point, it was obvious they both agreed that the existing set up had served its purpose and all parties were at the point where they had to look at the future and different modes of operation.

Limited use of grant funds to date

In the first 40 of the 60 months of grant life, only \$170,000 or approximately 35% of the \$500,000 allocated has been used. It was suggested by TA/ACK that this indicates a lack of both planning and personnel and an ultra-conservative outlook.

NSU stated that grant funds have been used only as needed to supplement other resources and directed specifically toward activities that increase the faculty's experience in tropical soils. McCants pointed out the need for necessary leadtime and predicted that as the total aspects of the tropical soils program comes into sharper focus, expenses will increase substantially. The planned use of remaining funds is explained in their proposal for an extension. McCants was particularly defensive on this issue and it was obvious that he as department head and not the grant program director was making the basic decisions regarding grant activity. His interpretation was that the grant was to build the expertise of existing staff, not new staff. When asked what he plans to do until the end of the grant term, he replied that NCSU proposes to begin work on its interim proposal for moving towards an international resource center, but if it is the intention to terminate the grant, they would continue as now initiating no new programs, using at most 1/2 to 2/3 of the funds by the end of the grant period. It was mentioned by the chairman that non-funded extension of original grants are no longer automatic. There were also some debate on the difference between prudent management and lack of initiative and imagination. It was obvious that the decision not to hire any new staff had been quite contested inside the family.

The extend to which NCSU has been able to build its competency thru 211(d) sponsored research

Of the grant money expended to date, about 50% has been used on research, including support of graduate students, student training, assistantships, etc. TA/AGR believe that the support of graduate students and student training per se is not likely to produce a meaningful capability for the institution itself.

North Carolina State made a good case of such use of funds to increase the competency of campus-based faculty, claiming it does so by: (a) giving the faculty a greater understanding of specific tropical soils problems; (b) allowing the faculty to travel to areas which serve as the basis for research and thus gain additional first hand experience; and (c) developing a more efficient methodology for training graduate students from developing countries and U.S. students interested in tropical soils.

The area of discussion centered first on the selection of graduate students and, indeed, even the priority which should be afforded to the training of graduate students since many seem to be unemployed when returning to their own countries. The employment situation was suggested as changing in many countries as more research and development is being undertaken. McCants agreed that there was a legitimate question on the percentage of the effort involved here stated that in the

future they would take a different route.

No collaborative research has been undertaken with any water or international agricultural institutions, although there have been many joint research projects with specific LDCs. While there have been some overseas seminars on soils, past symposia have been inadequate in the terms of scope of the participants because of their lack of problem-orientation. This led into the discussion of the need for closer coordination with CUSUSWASH institutions and the need for such an approach to be problem-oriented such as erosion control.

Finally the discussion broke open into what some of the team members had in their minds from the beginning, this is, the inadequacy of technical information relevant to specific LDC problems, and North Carolina's responding challenge of just how much technical information AID wanted. There was a great deal of interchange on the state-of-the-art beginning with who should have-or should in the future-taken the leadership in coordinating such an effort. The state-of-the-art was discussed as being basically: (a) a search of the literature; (b) the categorization and evaluation of practices and uses; and (c) analysis leading to the identification of knowledge gaps and research priorities. A literature review was done in the research contract but no equivalent work has been done worldwide. Sanchez expressed concern about duplication of effort, concerns which were not particularly impressive to the team but which did point out the need for coordination of such efforts with international organizations such as CIAT. This of course gave rise to the point that this was one of the reasons for programmed linkages and research networks. Sanchez suggested that this was a role for the consortium and there was a discussion on various approaches to doing a structured state-of-the-art effort for tropical soils.

NCSU's awareness of and concern with energy saving measures for LDCs

The shortage and increasingly high cost of energy in the world has raised a question mark on the advisability of the continued export of high energy technology, e.g., use of fertilizer, to the developing countries. TA/AGR posed this issue to obtain NCSU's ideas on low-energy technology options with particular emphasis on their effects on small, marginal farmers, the use of legumes in cropping systems to alleviate nitrogen shortage; breeding of new varieties suited to soil fertility constraints; and the study and analysis of potential farm wastes and organic residues for maintaining

soil fertility.

NCSU's written reply states that "Our experience overseas has taught us that there has always been an 'energy crisis' in rural, tropical America and thus many of our research efforts have been aimed at minimizing the need for fertilizers, other amendments and mechanizations in areas such as the Amazon jungle and the Central American highlands." Ample evidence was provided to show a working concern in this area but it was admitted that the present NCSU capability-building activities are not sufficient in scope to meet LDC needs. This was suggested by NCSU as its basis for a requested expansion of the program.

Gill expressed the need to know what the alternatives were in terms of legumes, breeding work, etc., particular as they related to the small farmer. Sanchez believes NCSU has a sense of direction in this area and agreed that there is such a need. There followed a technical conversation regarding, for example, the alternatives to the use of phosphate fertilizers. McCants indicated that perhaps NCSU didn't have the information needed to know just how to respond to this type of a problem. It was suggested that North Carolina carefully review this in terms of a new research and/or 211(d) program and to recognize that it is a new ball game.

Finally, it was generally agreed that the coordination of an energy approach to food production will be extremely difficult, particularly with the advent of the International Fertilizer Institute and the International Plant Nutrition Institute, which will increase many fold the overall research effort. McCants pleaded for some direction and assurances that North Carolina's approach to the problem is reasonable.

Lack of minority involvement

The chairman introduced this issue during the discussion. Dr. McCants indicated that North Carolina State was complying in both the letter and spirit to all equal employment at the federal, state and institutional levels and that he had done personally everything reasonable to get minority involvement, but without success. There was a brief discussion of how 211(d) funds might be used to encourage and facilitate such involvement of minority groups including special attention to the role of women in development.

Current and potential demand for utilization of NCSU's institutional response capability

In the review background material, TA/AGR stated that there has been a passive attitude, both on the part of AID and NCSU, regarding sale ability and utilization of the tropical soils institutional capability in the developing countries. Except for some Latin American countries and a few USAID personnel in other regions, it is doubtful that many LDCs know about the availability of NC State expertise to solve their soil fertility problems.

In its written reply NCSU states that the current demand for utilization of its capabilities exceeds by far their capacity to respond. Several countries have asked NCSU to become deeply involved in cooperative research programs similarly to those presently conducted in Brazil, Peru and Central America. This is a measure of current demand and potential and is expected to far exceed their present response capability.

Breitenbach asked that if these demands materialize could North Carolina, with an expanded research contract, fill the required positions. McCants answered that this depended upon the long term commitment of AID. If the team recommends the same (that this, entering into a utilization mode-211(d) grant) and gives them access to the remainder of the current grant funds, then something could be worked up on a mutual basis. Even so, this would mean going outside the university as faculty members are fully committed. The flexibility provided in the grant has now been used up. North Carolina will have to do some rearranging, in fact they said this has already started, NCSU does not anticipate any large scale increase in staff, but bringing in some carefully selected young man who will provide research and release time and build up the faculty base.

Grant expiration verses extension

Two issue statements were originally designed to elicit comment on the amount of grant-funded activity that would be assumed by the university, NCSU's preception of end-of-the-grant status, and an explanation of any proposals for grant extension/revision.

The university claims it cannot provide adequate financial support for international work from funds appropriated by the state legislature. Nevertheless, because of the university's own commitment, as many activities as possible will be maintained, e.g., the continuation of Sanchez as a tenured professor of tropical soils, and graduate level courses in tropical soils. On the other hand, activities presently supported mainly by AID research contracts will be picked up by 211(d) funding, if necessary, e.g., exchange of information (SIC).

At this point discussion centered around an outline for the proposed extension prepared beforehand by the university (See Attachment No. 2). The discussion on this proposal is detailed in Part I of the summary included as Attachment No. 3 prepared by the LA Bureau team member and should be referred to by all readers at this point. Beginning in April of this year, TA/AGR staff was suggesting to the Executive Director of the Soils Consortium that they should begin thinking of what kind of a working association they expected when the present grant terms were completed. The original proposal of the soils institutions for an administrative overhead structure was rejected by TA/AGR as adding nothing to what could already be obtained by AID and the LDCs directly from individual institutions. Some of the institutions, including North Carolina, then became uncertain and confused about TA/AGR's desire for some type of a domestic, synergistic, consortium network with the separate issue of an international or regional soils center.

In their latest annual report, North Carolina State reported on the planning for establishing a tropical soils network center and outlined their summary of the concept as follows: the objectives of the center are (1) to accelerate communication among tropical soils scientists on new advances in the field, (2) to conduct research and promote utilization of advances in soil sciences by farmers, (3) to serve as a focal point for AID and other donors seeking qualified scientists for specific functions and for developing countries requesting such a system, and (4) to help identify additional research and training needs in tropical soils and find appropriate support to implement them.

At the beginning of this review and in their introductory remarks NCSU was still favoring the development of such an international resource base and explained its own grant proposal as an interim measure towards that goal. By the end of the sessions, however, McCants seemed to have changed his thinking. After probing by the chairman, he agreed that no workable consensus had been developed and expressed his belief that the Universities of Puerto Rico and Hawaii preferred to maintain a loosely structured organization much similar to what we now have. North Carolina and Cornell prefer a more formalized, purposeful structure but McCants implied that this did not seem possible at this time without some "give" by Hawaii.

The purpose of the proposed grant extension was cited as to "continue building the technical capability of the Soil Science Department in tropical soils, via more direct action in LDCs that is aimed at utilization of such expertise." McCants said that after these discussions he

now change the purpose of the proposal and would emphasize the need for baseline data, i.e., state-of-the-art.

He stated he would like a two-year extension which would give them, along with one-year remaining on the present grant, a three-year commitment. North Carolina would start immediately on the new approaches discussed, and would play down establishing the center as a priority objective. Instead NCSU would emphasize the gaining of experience and initiation of activities which could lead to the establishment of such a center at a more propitious time. North Carolina feels it has gone as far as it can in pushing its own ideas with the other sister universities and Sanchez concluded by saying to the AID team members "the monkey is on your back."

III. FINDINGS AND CONCLUSIONS

Achievement of grant purpose

The purpose in the original grant is stated as to "...strengthen the existing competency of North Carolina State University in a collaborative effort with Cornell University, University of Hawaii, Prairie View A&M College and University of Puerto Rico to provide training, related research, technical assistance and consultation in soils science for increasing food production in soils of humid tropics." The grant was to be used to (1) establish a senior faculty position, (2) provide visiting professorships, (3) provide exchange graduate assistantships, (4) provide graduate research assistantships, (5) provide support of graduate students, (6) modify existing soil courses and develop new courses in tropical soils, and (7) strengthen library and other informational services.

Except for the expectations regarding cooperation with sister universities, there can be no doubt that North Carolina State University has done what it said it would do and has strengthened its competency, particularly its capability to analyze soil fertility problems and to develop fertilizer practices for solving them on humid tropical soils. It is an outstanding institution committed to the development scene with a long history of demonstrated willingness to work with AID. This finding is critical and the criticisms below, implied as well as explicit, are made within this context and with the realization that many of the problems discussed concern actions, or lack of actions by other organizations and institutions, not the least AID itself.



Nevertheless, it is impossible to determine how much of the progress cited in this review and prior annual reports is directly attributable to 211(d) grant activity and how much came from concurrent technical assistance and research contracts financed by IAB and the Latin American Bureau. While North Carolina State has fulfilled the requirements of the grant, the grant agreement is very non-specific regarding outputs and without guidelines or milestones for the assessment of progress.

There is a pattern of conservatism in the administration of this grant which expresses itself in a lack of imagination, innovation, and initiative resulting in a string of "missed opportunities" in both failing to adequately distinguish between a grant and a contract, and to utilize the freedom and flexibility provided in the grant mechanism. North Carolina has too often taken a passive approach waiting for instructions from AID which never came. The assignment of the grant program director as project leader for the two AID contracts left him with too little time and no assistance for planning grant activity. In our open discussions, North Carolina State strongly defended their actions and will continue to do so but they have been sensitized and agree that a new approach is necessary. North Carolina has one of the strongest research and training programs on tropical in the nation. The 211(d) has added momentum to this program but there are some major weaknesses partially attributable to an early change in department heads, a lack of purposeful aggressiveness, and a paucity of solid planning for the future.

Knowledge of developing country problems

There is no doubt that North Carolina State has accumulated a very substantial knowledge regarding tropical soils but most of it has been developed through its long involvement in Latin America with technical assistance and research contracts. 211(d) funds have not been used to categorize and analyze this information, to adapt it to the technological and economic needs of the small farmer, to test its applicability in other soil systems and regions of the world. More effort could have been put into the analysis of specific fertility problems of tropical soils based on the literature and on North Carolina's own experiences. These reviews could have been concentrated on the state-of-the-science. Reviews of the state-of-the-art, i.e., how things are done and why farmers do not follow recommendations have not been attempted. NCSU's response to the energy question did not show much imagination with respect to future orientation in a world of

scarce and expensive energy. Team members were not convinced that much was being done, for example, with legumes as a source of nitrogen, the selection of varieties and or species that are acid and aluminum tolerant so that often expensive liming can be dispensed with. Little or no attention is being given to the selection of species or varieties that have greater capacity for extracting nutrients from native soil minerals in lieu of scarce and expensive fertilizers. Nothing is being done on-site with re-cycling of crop residues or the use of organic waste. As has happened in other grant reviews, university officials were apparently shocked when they realized what AID now expects, what they could have done, and what they have failed to do. In this and in similar cases a major portion of the fault lays with the institution itself in failing to exercise its responsibilities, to seize the opportunities present, and to utilize the flexibility provided them in the grant instrument. On the other hand, until recently, AID has played a passive and hands-off role which also contributed to the conditions described. The need for more effective work in identifying specific LDC problems and in developing technologies and practices applicable to these problems, particularly at the small farm level, was readily apparent by the end of our discussions. The university was looking to AID to provide the leadership and coordination necessary to do an effective job.

Response capability

North Carolina State is running at full capacity Any significant increase in overseas activity of a long-term nature will require outside recruitment. More frequent involvement of existing faculty on short term assignments will also require more release time built in by addition of younger staff members. While a high quality research capacity exists, without some rearrangements of priorities and addition of staff it will be difficult for North Carolina State to do the necessary state-of-the-art work both on-campus and in cooperation with other interested U.S. universities and overseas linkages. There is competence at the problem identification and analysis level but it is somewhat parochial and needs strengthening both in terms of tropical soils and the integration of soil disciplines with other areas aimed at a systematic approach to increasing crop production.

NCSU's training facilities in soils, particularly soils analysis, are outstanding. However, it doesn't appear that enough attention is being given to training of LDC students in the simpler ways of running chemical analyses and making

soils tests. Modern methods depending on electronics and dependable power supply are more accurate and rapid but sufficient accuracy can usually be obtained with methods used without such sophistication. To date North Carolina has apparently been thinking only in terms of academic or workshop training for soil scientists and teachers with little attention to the need for special, on-site training programs, specifically aimed at appropriate levels and audiences at the grassroots level. The same criticism can be stated about the program of publications and information dissemination. Too much of it is at the sophisticated and scientific level and not enough thought is being given to developing non-scientific papers and other means of communication and the transfer of knowledge at the users level.

It was made very clear in these discussions that the Agency's 211(d) grant program, as presently reconstituted, is aimed at developing response capabilities to be used on LDC problems and, mostly in the LDC, and that any rationale for extension of the 211(d) grant must emphasize those activities which are necessary to sustain and facilitate the utilization of such capacities, e.g., more effective and directed training, applied research, network linkages, and etc. A concrete example of what is meant is included in attachment #3, page 6 and 7.

In short, there is still a need for the development of institutional response capabilities within a specific focus and perhaps geographic orientation. North Carolina State should begin immediately with its existing grant to zero in on these specific needs.

Systems approach and role of the consortium

The original grants set up the following fields of concentration; Cornell-cultural systems; Hawaii-biology and mineralogy; Prairie View-soil fertility under savannah prairie ecology; Puerto Rico-conservation and protection; and NCSU-soil fertility relating plant nutrition to the physical and chemical properties of humid tropical soils. An earlier review at Cornell University concluded that Cornell never accepted or understood the concentration or division of labor planned for it. At the comprehensive review of Prairie View it was concluded that first there was a great deal of debate on just what savannah prairie meant and, second, that whatever it means-prairie's competence in the area is very thin. It remains for future teams to review this question regarding Hawaii and Prairie View but it seems reasonably certain to conclude that, with the exception of NCSU, the conceptual approach originally envisioned by AID has not been accepted or found feasible by most participants. At the same time, a geographic specification

is implied but not specified with several consortium members.

It will be difficult for TA/AGR to reach a conclusion on the collective versus individual approach until the aforementioned reviews are completed and circumstances may change in the meantime. Nevertheless, if the current and potential demand is as significant as stated, some pooling of talent will be necessary, at least among those institutions willing and able to do so. This will involve more than simply establishing a coordinating office with a full-time director but a re-definition of the institutional foci in terms of areas of scientific specialization, e.g., classification, soil acidity and liming, etc., and perhaps a secondary focus on homogenous geographic areas. Better coordination among institutions will result from such redefinitions of responsibility and some members have already gravitated in this direction by virtue of their historical competence and interest in specific soil problems and regionally, from their linkages with international and LDC institutions, and former students. The geographical approach has much to be commended, particularly in terms of applied research but the drawbacks of such an approach include (a) compartmentalization and a reduction in the efficiency of the use of institutional resources by the agency as whole, (b) inhibiting an integrated approach to research and development of new technologies with institutions of other disciplines and (c) inhibiting the transfer of knowledge between regions. The problem is to define some focus which will provide both the necessary scientific and geographical emphasis in a workable approach. This, of course, depends on the capacity and willingness of the individual institutions which now make up the loose confederation called the soils "consortium." It also depends on a genuine feeling from each institution that it will gain something it could not otherwise gain with such cooperative arrangements, a feeling which so far seems evidenced only by North Carolina State.

Cooperation with CUSUSWASH to date has been friendly and indefinite, consisted mainly of exchange visits at annual executive meetings. What is needed is joint work at the technical level, oriented to a particular problem. On the water side, the University of Arizona has taken the initiative in proposing an international seminar on soil and water management for erosion control and several alternatives have been forwarded to AID/Washington. One problem for CUSUSWASH is how to deal with the soils consortium which has already been stated, is really a very loose confederation. The team applauds this type of purpose-oriented approach and hopes that TA/AGR will take immediate action to put CUSUSWASH in contact with one of the soil institutions, e.g., NCSU or Puerto Rico.

Basis for Extension/Revision

The team sees no need for an international center for soils research, particularly one located in the continental United States. If such an international center does develop, we would hope that U.S. soils institutions would be in a position to cooperate with it but, more likely, that they can cooperate in putting a soils input into the particular crop specialization of the existing international centers. Insofar as North Carolina State is concerned, this means developing out a better relationship with its sister institutions and developing working relationships with the water institutions. This is where, in the opinion of the team, priority efforts is needed.

If the 211(d) grant is not extended, there would probably be little immediate impact on the campus, particularly in view of the fact that so little work has been done in areas other than supplementing contract work. On the other hand, if the two contracts should be terminated or drastically reduced, the experienced overseas staff would quickly disapeate. This is a question of particular importance to the Latin America Bureau and their views should be solicited. Separate from this point of an adequate base for current demand is the need for further institutional development within a re-defined focus as discussed above. If such a focus can be defined, then indeed the 211(d) instrument may be the most effective and cheaper instrument available to facilitate the utilization of a finely tuned response capability in accordance with an approach specifically to designed for developing countries and emphasis on the small farmer and crop production.

North Carolina State wants a signal from AID, as soon as possible, that they are willing to enter into such a new grant arrangement. Logically, such a decision should wait until the review of all the consortium members are completed next February or March. Such a delay, however, would inhabit North Carolina from making immediate changes with its existing grant, and is not necessary if the response from the LA Bureau on the question just above, is to maintain and expand the capacity in being. In such a circumstance, the agency should inform North Carolina that it does intend to negotiate a utilization type grant revision with them but that the final form of such an agreement will have to await the review of all consortium members and any collective suggestions they may have. In the meantime North Carolina, should proceed to finance from its current 211(d) funds those activities which will lead to developing the response capabilities outputs discussed in this review. Specific mention should be made of additional staff to provide more release time and planning. Preliminary

discussions should begin at once on an effective approach for a major state-of-the-art effort.

In summary, while the team has found fault with some things North Carolina State has and has not done with its 211(d) grant, it is a key institution for the agency, particularly the LA Bureau, in the soils area. Its cooperation and support will be indispensable to any agency efforts in developing technological packages, mounting integrative research the soil and water level, and providing specialized training. It seems apparent to the team that a revised grant, rather than any specific contracts feasible in the near future, is more apt to have an immediate and enduring effect on their policies and priorities, and as such should not be overlooked in the selection of alternative ways of working with North Carolina. In this sense, the cost/benefit ratio to AID clearly points to use of a modified 211(d) grant extension as the optimum instrument.

IV. RECOMMENDATIONS

The following recommendations to YA/ACR management should be considered within the framework of the findings and conclusions developed above.

1. The decision - as differentiated from an actual amendment and revised agreement - to extend and transform the current 211(d) institutional development grant to the utilization mode-or-not-should be made as soon as possible and communicated to NCSU. A favorable decision should not await the review of the remaining tropical soil consortium members but should be contingent on:

- (a) LA Bureau's concurrence;
- (b) processing through normal agency decision channels; and
- (c) the conditions listed in the following recommendations.

2. The actual detailed development negotiation and formal amendment of a utilization revision should be delayed until the comprehensive reviews of all tropical soil consortium members are completed - currently estimated to be February or March 1975.

3. The agency decision to extend the current agreement into a utilization phase should be contingent upon NCSU's willingness to (a) incorporate desired changes in focus, emphasis, outputs, etc., in its current grant and (b) reflect the following:

- . use of grant funds to provide more staff time for planning, coordination and consultation.
- . initiation of state-of-the-art efforts on specific fertility problems of tropical soils which emphasize (1) needs of small farmer; (2) energy constraints; (3) low-cost and low-technology inputs and (4) alternatives for varying circumstances and conditions found in the developing countries of the world. These efforts should also be related to, coordinated and, to the extent feasible, jointly developed with other interested organization, e.g., AID, other tropical soils and CUSUSWASH institutions, and selected international research centers.
- . increased attention to on-site (non-campus) workshops and seminars as both a training mechanism for non-academics and to increase LDC involvement-particularly at the user level.
- . development and dissemination of non-scientific publications intended for non-academic and grass-root level usage on the transfer or relevant technology to LDC's.

4. After the reviews of all tropical soils grantees have been completed, TA/AGR will have to reach some conclusions on what role, if any, there is for a collective approach through a consortium, center or other mechanism-including a re-definition of the institutional foci of the individual participants. Such a refocussing must consider both geographic and scientific specialization. The results of this review should be reflected in the revision of the NCSU (and any other) soil grant. If a collective approach is still deemed useful, TA/AGR should take the initiative in involving the interested soil institutions, although such involvement will not necessarily require a utilization extension in every case.

Response to
ISSUES' PAPER
for
Comprehensive Review of 211(d) Grant
North Carolina State University
July 25-26, 1974

Issue No. 1: Extent of NCSU's Knowledge About the Developing Countries,
Especially Outside of Latin America.

Since the inception of the Soil Science Department in 1955, members have accumulated extensive first-hand knowledge of developing countries as a result of extensive travel and/or long term overseas assignments. The present faculty has first-hand knowledge of all countries in the hemisphere except Haiti, Surinam, and French Guyana. Since 1955, there has been at least one member of the Department stationed in Peru. Since 1964, one or more staff members have been assigned to Guatemala and Brazil. During the last two reporting periods of the 211(d) grant (July, 1972 to June, 1974), a total of 20.3 man-years have been spent overseas by departmental faculty and graduate students. This number includes an average of 9 soil scientists stationed overseas on long-term assignments and 26 campus-based faculty and graduate students assigned overseas for short periods. All have been working assignments conducted in cooperation with local institutions. The accumulated knowledge, therefore, is not limited to soil-related matters but also to the general problems of development in these countries.

Although our main thrust has been towards Latin America, the Department's faculty is by no means lacking first-hand knowledge of soil-related problems in tropical Africa and Asia. Dr. Bartholomew conducted one of the first studies on soil nutrient cycling in tropical rain forests of what was then the Belgian Congo. Dr. Sanchez has taught and conducted research on the management of flooded rice soils in the Philippines. Dr. Fitts has consulted intensively throughout the last 10 years in India and Indonesia on soil fertility evaluation programs. Several faculty members have visited research institutions and made on-site studies through West Africa, Kenya, Rhodesia, India, Taiwan, Philippines, Thailand, and Australia. Our contact with many former students from Africa and Asia (6 at present), who are now recognized leaders in their countries, has also increased our knowledge of their problems. While it is true that our experience in tropical America are much greater, our exposure to the rest of the tropical world is sufficient to permit focusing problems on a wider perspective.

One quantitative measure of our knowledge about tropical soils in developing countries is the number of scientific publications written by the Department's faculty on tropical soils - 119 to date. Of these, 94 refer to information from Latin America, 12 to information from tropical Asia and Africa, and the other 13 to tropical soils in general.

(a) The magnitude of the number of man-years of living and working in tropical countries has made our faculty a major source of technical advise on soils-related matters to policy making bodies of many LDC's. Our faculty has participated in numerous study tours, advisory commissions, etc., sponsored both by the countries themselves or by AID

and other international donors. It is a reasonable deduction that a considerable portion of the policy decisions on soil fertility evaluation and field research results from the savanna and jungle areas made by LDC institutions or by AID are based on information and programs generated by this Department.

- (b) As examples of developing skills in problem identification, analysis, design, operation, and evaluations, it should suffice to cite the novel and creative approaches and successes throughout Latin America of the International Soil Fertility Evaluation and Improvement Program; the extremely successful National Rice Program of Peru which helped that country change from a 20% net importer of rice to a 20% net exporter in a period of four years; the comprehensive solution of most potato fertilization problems in Peru; the innovative research being conducted in the Amazon Jungle, the Campo Cerrado and the development of the fertility-capability soil classification system. It is relevant that all these projects were started from essentially ground zero and that their success resulted in large part to the ability to identify problems, design the appropriate programs for their solution, and carry them through to completion within the usual bureaucratic and political constraints of international work.
- (c) The Soil Science Department has established meaningful linkages with the following types of institutions:
- (1) National research and extension institutes: EMBRAPA (Brazil), IAC (Campinas, Brazil), the Ministries of Agriculture of Peru, Bolivia, Venezuela, Panama, Costa Rica, Nicaragua, El Salvador, INIAP (Ecuador), ICA (Colombia), CATIE (Turrialba, Costa Rica), ICTA (Guatemala), IVITA (Peru), and Instituto Geografico (Colombia).

- (2) National agricultural universities: La Molina (Peru), Lambayeque (Peru), Vicosa (Brazil), the University of Costa Rica, Chapingo (Mexico).
- (3) International Institutes: CIP (Peru), CIAT (Colombia), IRRI (Philippines), IITA (Nigeria).
- (4) U. S. Universities involved in tropical soils (the other four Consortium members) plus the Universities of Florida, Wisconsin, and Purdue; the Tennessee Valley Authority; Ford and Rockefeller Foundations; and the National Academy of Sciences.
- (5) USAID Missions in Brazil, Peru, Panama, Costa Rica, El Salvador, Ecuador, and Guatemala.

Our definition of meaningful linkages refer to actual working relationships involving either joint teaching, research, or technical assistance programs or close consultation and collaboration. Only those institutions with which we have such relationships are listed. There are many other institutions with which we have occasional linkages or are in the process of being developed. An example of the latter is ICRISAT in India.

- (d) Our dissemination systems consist primarily of sending publications arising from our research contract and 211(d) activities to a mailing list consisting of 450 soil scientists, institutions, and key administrators around the world. This is supplemented by organization of and participation in conferences and symposia in the LDC's themselves, the annual ISFEIP Soil Fertility Evaluation Seminar at Raleigh, and the distribution of ISFEIP's publications.

(e) The planning of NCSU's overseas activities is done at the Department Head's level in consultation with the two project leaders (Dr. J. W. Fitts for ISFEIP and Dr. P. A. Sanchez for the 211(d) grant and the research contract) and the faculty. This is an informal and continuous process. Formal action is taken on long-term issues such as the future direction of the 211(d) program. The underlying philosophy of our international soils program is that for our activities to be fully effective, the effect must be measurable at the farm level. A proposed program for utilizing our capability more effectively will be presented.

Issue No. 2: Extent of NCSU's coordination of grant activities with the other Consortium institutions, the research contract, ISFEIP, and Cornell's research contract.

- (a) Activities of common interest supported by the 211(d) grant have been closely coordinated with the other four members of the Consortium through semiannual meetings of the Executive Committee, joint Institutes, Seminars, Workshops, visiting professors, and countless informal scientist-to-scientist contacts.
- (b) Within the Soil Science Department, the 211(d) activities are intimately merged with those of the AID/csd 2806 contract. Both projects are under the leadership of Dr. Sanchez. In this way, the capability-building and research activities are totally integrated as one program: the Tropical Soils Program. The relationships between the Tropical Soils Program and ISFEIP have always been close, both on campus and overseas. The relationships are complementary; the first deals with teaching and research; the second deals with technical assistance. The interplay

between these three functions involves about 40% of the Soil Science Department faculty.

- (c) The Cornell and NCSU soils research programs are totally integrated operations. This has been accomplished through close coordination at both the planning and the operational levels at the campuses and at Brasilia. NCSU's research activities in Peru and Central America and Cornell's activities in Puerto Rico and those projected for Ghana, are coordinated also in a more general way through informal discussions between the Cornell and NCSU project leaders.
- (d) The missing link in this chain of adequately coordinated projects is a clearly defined utilization component. Recommendations for remedying this situation will be presented.

Issue No. 3: Rationale for limited use of grant funds to date.

Grant funds have been used only as needed to supplement other resources directed specifically toward activities that increase the faculty's expertise in tropical soils. The limited use of funds during the first years is also related to the lead time required to plan an effective program of utilizing these capabilities on a longer-term basis than for a five-year period. As the total aspects of our tropical soils program comes into sharper focus, expenses will increase substantially. The recommended use of the remaining funds is explained in NCSU's proposal for future action.

Issue No. 4: To what extent has NCSU been able to build its competency through 211(d) sponsored graduate student research?

Graduate students are a vital part of any academic and research program. The limited use of 211(d) funds to support graduate research programs in tropical soils has increased the competency of campus-based faculty by

(a) giving the faculty a greater understanding of specific tropical soils problems, (b) allowing the faculty to travel to areas which serve as the basis for the research and thus gain additional first-hand experience, and (c) developing a more efficient methodology for training graduate students from developing countries and U. S. students interested in tropical soils. There is no satisfying substitute for conducting research on tropical problems as preparation for a career in tropical soils.

Mr. Granger's research program in Guyana allowed his advisor, Dr. Buol, to get acquainted with soils from the coast and interior of Guyana and for the first time to characterize soils from the latter area. Mr. Turner's research programs acquainted Dr. Gilliam with the chemistry of flooded rice soils, a knowledge which is very scarce in U. S. campuses, although it is the basis for production of the world's most important crop, rice. By combining Dr. Gilliam's expertise on the chemistry of soil phosphorus with the problems presented by Mr. Turner, a new mechanism was identified as the main reason for increased phosphorus availability in flooded soils—diffusion. This new insight may be very helpful in solving a problem which has baffled soil scientists for decades—soil testing for P in flooded soils. Mr. Lopes' experience in Brazil enabled Dr. Cox to gain new insights on micronutrient problems in Oxisols.

Issue No. 5: To what extent is NCSU aware of, and active in energy saving measures for LDC due to the worldwide energy crisis?

Our experience overseas has taught us that there has always been an "energy crisis" in rural tropical Latin America and thus many of our research efforts have been aimed at minimizing the need for fertilizers.

other amendments and mechanization in areas such as the Amazon Jungle and the Central American Highland. (The Savannas, especially the Campo Cerrado are an exception in terms of mechanization due to government policies.

- (a) We are aware of the increased shortage of energy and fertilizers in the Amazon and Central America. Our staff assigned to Yurimaguas frequently has not been able to obtain sufficient quantities of meat and vegetables and often it is a problem to buy sufficient quantities of rice, cassava, and plantains in the market. Fertilizers are extremely difficult to obtain in Peru, Costa Rica, and El Salvador even for research purposes. By living in this environment, our research is designed to increase food production not up to the classic economic optimum but to a reasonable level with minimum external inputs somewhere in the linear part of the response curves. Some of our results strongly support the use of the traditional slash and burn system of clearing in comparison to mechanized land clearing which actually decreases yields, causes soil compaction in sandy Ultisols, and disturbance of the topsoil. The nutritive value of the ash after slash and burn is actually free fertilizer which the farmers can use.
- (b) The use of legumes in cropping systems has not only been analyzed but is an important component in all our research programs. Substantial efforts are underway by Mr. Russell Yost in Brasilia and Mr. Cesar Lopez in Yurimaguas for the adaptation of tropical legumes to pasture systems. Research on multiple cropping systems by Dr. Donald Delisle in Costa Rica and Mr. Michael Wade in Yurimaguas include the use of grain legumes but the results indicate that the legumes supply their own nitrogen but provide little for the associated crops. The use of

more efficient, slow-release fertilizers such as sulfur-coated urea could lower significantly the rates of nitrogen required in these systems. This practice is being evaluated.

(c) The study of crop varieties tolerant to high levels of aluminum saturation and low available soil phosphorus is an active component of our research program. Mr. Jose Salinas is devoting full-time attention to this issue through greenhouse experiments in Raleigh to be followed by two years of field research in Brasilia.

(d) The management of crop residues via mulching, burning, and/or incorporation is presently being evaluated in the Amazon Jungle by Mr. Wade and in Costa Rica by Dr. Gelsigle not only as a means to maintain soil fertility but also to decrease the rate of organic matter decomposition in soils after clearing the jungle. The use of animal or municipal wastes has not been evaluated in our tropical research programs since there is not enough of such wastes available in a utilizable form in the rural areas where we are working. This subject is a major issue in the department's research program in the state and some insights obtained might be applicable to the tropics especially since many of North Carolina's soils have very similar properties to many Ultisols and Oxisols of the tropics.

The present NCSU capability-building activities are not sufficient in scope to meet LDC needs. An expansion of the programs will be presented.

Issue No. 6: Assumption of grant-supported activities by the University or other AID sources.

The University cannot provide adequate financial support for international work from funds appropriated by the State Legislature. The University's commitment to the grant's objectives, however, is substantial.

One evidence is that the position of Professor of Tropical Soils is a tenured one, and thus has permanency. Another is the initiation of the graduate level course in tropical soils as well as the modification of several other courses on a permanent basis. Other activities presently supported mainly by the AID research contract, such as the mailing list distribution may pass to 211(d) functions when the exchange of information increases beyond the scope of the research contract publications.

Issue No. 7: What is the current and potential demand for utilization of capacities?

The current demand for utilization of NCSU's capabilities in tropical soils work exceeds by far our capacity to respond to it. Several countries (Colombia, Venezuela, Ecuador, Dominican Republic) have asked us to become deeply involved in cooperative research programs similar to those presently conducted in Brazil, Peru, and Central America. This is beyond the scope of our research contract. The demand for utilization of services is also great in Latin America and is expected to increase as more soil specialists from the area become more aware of our research and training results. The potential demand is expected also to exceed our response capability.

Issue No. 8: What is the perception of the University for an end of the grant status?

NCSU has prepared and will submit a proposal for a grant extension.

Table No. 1. Number of scientific publications of the Soil Science Department staff on tropical soils prior to and since the 211(d) grant.

Geographical area	1953 to 1970	Since the 211(d) Grant			Total
		1971-72	1972-73	1973-74	
Latin America	23	27	17	27	94
Asia and Africa	7	0	4	1	12
Tropics in General	6	4	2	1	13
Total	36	31	23	29	119

Table No. 2. Degrees awarded by the Soil Science Department since its inception by geographical origin.

Nationality	1955-60	1960-70	1971-74 ^{1/}	Total Awarded
United States	17	62	24	103
Latin America	5	16	14	35
Other Foreign	2	15	4	21
Total	24	93	42	159

^{1/}Period of 211(d) grant.

Table No. 3. Distribution of graduate student enrollment in the Soil Science Department since the beginning of the 211(d) grant by program orientation and geographical origin.

Program orientation	Geographical origin	Academic Year			
		1970-71	1971-72	1972-73	1973-74
Tropical Soils	United States	1	4	6	8
	Latin America	2	10	11	10
	Other	0	0	0	1
	Total	3	14	17	19
Domestic Issues	United States	13	15	15	13
	Latin America	6	1	1	6
	Other	10	4	3	4
	Total	29	20	19	23
TOTAL		32	34	36	42

Discussion Outline
for a
PROPOSAL FOR EXTENSION OF THE 211(d)
GRANT FOR THREE YEARS (1975-1978)

Purpose:

To continue building the technical capability of the Soil Science Department in tropical soils via more direct action in LDC's that is aimed at utilization of such expertise.

Relationship to other AID funded activities:

Complete integration with Contract AID/1a 646 and Contract AID/csd 2806. The three programs have the same ultimate goal--to increase food production in Latin America. Their specific responsibilities, while different, are complimentary.

Activities proposed:

Items 1 and 2 are a continuation of the present program. Items 3 through 8 are new proposals.

1. Continue support for the senior faculty position on tropical soils. The person in this position will serve also as tropical soils project leader and will teach a graduate course on "Characteristics and Management of Tropical Soils."
2. Continue strengthening faculty expertise through (a) modifying courses to include new information on tropical soils, (b) faculty travel in the tropics, (c) graduate assistantships, and (d) strengthening library resources.
3. Establish a tropical soils information network in the following manner: (a) establish formal agreements for membership in the network

with appropriate international, LDC, and U.S. institutions*, (b) transmit new publication of the members that are relevant to all network members, (c) translate selected key articles into English and/or Spanish and/or French for distribution among the network, and (d) publish a "Tropical Soils Newsletter" on a regular basis to keep the network members abreast of current developments in the subject matter area.

4. Establish formal, substantive linkages with international centers (CIP, CIAT, CATIE) and national institutions (EMBRAPA (Brazil), Ministry of Agriculture and Agrarian University (Peru), ICA (Colombia), and possibly the Ministries of Agriculture of Venezuela and the Dominican Republic. These linkages are expected to consist of long-term cooperative projects on training, research, and utilization. They will serve as a base for the activities described below.
5. Cooperative Research through former graduates. This proposal is for a new methodology for utilizing our institutional capability. Establish cooperative research agreements with recent NCSU graduates who have returned to the LDC's and are in leadership positions. These kinds of people are a very valuable resource in the LDC's because they have excellent technical training and usually have a strong motivation to apply their expertise to help solve their countries' problems. They seldom can utilize their capability adequately, however, because of a variety of local constraints.

* List appears on pp. 6-7 of our July, 1974 Center Proposal.

Through cooperative agreements, we can utilize their resources to accomplish projects of mutual interest. If this approach is successful, LDC personnel would eventually conduct the major portion of the research and/or utilization activities presently done by U.S. personnel overseas and the role of Departments, such as ours, would concentrate more on backstopping these projects without permanent staff assigned overseas. We have five excellent opportunities presently available to initiate this approach. They are Dr. Villagarcia in Peru, Mr. Munevar in Colombia, Mr. Mendez in Panama, Mr. Alvarado in Costa Rica, and Mr. Manzano in Bolivia.

6. Establish a sabbatical leave program through which competent working LDC soil scientists would spend a semester or two on campus as a Visiting Professor. This would (a) add additional expertise to our faculty by sharing their experiences with us through special courses, seminars, etc., (b) keep the LDC scientist up to date with the latest in soil science, (c) give them deserved recognition in their country's institutions, and (d) strengthen linkages. The visiting professor concept exercised during the first five years of the grant has involved outstanding authorities, but who are not from the LDC's.
7. Conduct a workshop for teachers in elementary soil science for Latin American Universities. The purpose would be to bring them up to date with (a) new advances in soil science and (b) new teaching techniques. The "modernization" of the elementary courses would be of substantial impact in the LDC's and would also increase our expertise in how to transfer soil science teaching technology.

8. Conduct periodic workshops with 10 or 15 of NCSU's soil science graduates now in key positions in LDC's. The purpose would be to involve them as advisors in designing our new research and utilization activities.

UNITED STATES GOVERNMENT

Memorandum

TO : Raymond Kitchell, AA/TA
THRU : Robert Laubis, LA/DR/RD
FROM : Charles A. Breitenbach, LA/DR/RD *C.A. Breitenbach*
DATE: September 4, 1974
SUBJECT: Report on N.C.S.U. Comprehensive Review of the 211(d) Grant July 25 - 26, 1974

It is my understanding that in my capacity as a member of the NCSU 211(d) team I was requested to provide three inputs for your summary report on the July 25 - 26 211(d) Grant review. These were: (1) The minutes of the morning session held on July 26 at which time the review committee discussed NCSU's proposal for a revision of the 211(d) Grant. (2) A statement on the possibility of obtaining blanket permission for specific NCSU 211(d) technicians to obtain reentry privileges to perform defined assignments in stated LA countries during a specified time period. (3) A position paper on the outputs which might be expected under the 211(d) Grant in its capacity as a resource base for the establishment of a linkage network in the fields of (a) soil fertility research and (b) soil fertility evaluation and recommendation assistance.

The writer had originally sent in his memorandum to Mr. Kitchell during the first week of August while he was on TDY in Paraguay. Unfortunately that document never arrived. The present memorandum is handicapped by the fact that the writer no longer has all the notes available which he had when the first memorandum was prepared.

I. Minutes on A Proposal for Revision of the 211(d) Grant (Morning Session July 26, 1974.)

Mr. Kitchell began the session by explaining that since AID's study during the summer of 1973 of the institutional grants program, AID's expectations regarding the outputs of the 211(d) Grants program have been modified. Previous to that study, the only requirement of these grants was to build the institutional capacity of the grantee to provide developmental assistance to lesser developed countries. Since that study AID has judged the success of a grant on the assistance a grantee has provided to the LDCs as well as on the capacity it has developed to provide such service. As a consequence, the Agency is now encouraging active participation on the part of 211(d) grant institutions in overseas activities.

Dr. Charles McCants responded that he favored the new AID position. He said NCSU has no interest in any contract or grant with the sole purpose of building its prestige. The University is anxious to enter agreements which can be of mutual benefit to the University and to the donor, i.e. AID assisted lesser developed countries.



The proposal of an international resource base from which a network of soils research and technical assistance could radiate was discussed. At the start of the morning session the NCSU staff appeared strongly to favor the concept of such a base. By the end of the day Dr. McCants appeared to have changed his stand. He believed that whether or not a resource base was to be formed was a tactical matter which might best be resolved by the deans of the four universities who comprise the AID soils consortium. He felt that if 211(d) Grant funds were to continue to be available to NCSU it should be the university's purpose to develop a competency and a resource of experience which could be placed into a "center" if the consultative group were to put up necessary funds for such an entity.

The eight activities mentioned under the proposed revision of the 211(d) grant, document #21, were discussed in order:

1. Continued support for a senior faculty position on tropical soils.

The AID review team expressed its opinion that the grant could well have been used to employ more than one full time staff member, Dr. Sanchez. They believed that his appointment both as the only 211(d) salaried employee and as head of the soils research project AID/csd-2835 was not consistent with the requirements of the grant.

Drs. McCants and Sanchez agreed that more long term soils specialists were needed under the grant. The review team was assured that when a new grant proposal is negotiated more faculty members will be detailed to it. Dr. McCants felt that a preliminary requirement would be AID's extension of the grant for at least two years. He pointed out it would be difficult to acquire the services of the caliber of scientists which the university desired unless they were assured a minimum of two years of service.

2. Continue strengthening faculty expertise.

Mr. Kitchell pointed out that the university was in fact thinking in terms of institutional building under this item. Under AID's new concept it would rather the university think of faculty expertise in terms of "outputs", i.e. the backstopping of some sustained activity such as the training of graduate students to return home on specific assignments or the backstopping of specific soils use programs in specified countries.

3. Establish a tropical soils information network.

Mr. Kitchell pointed out that under the "output" concept on which 211(d) grants were now to be evaluated, the functions described under this item, i.e. functions (a) through (d) could all be considered services which the grant was to perform for the LDCs. AID would look favorably upon this.

Dr. McCants was asked to estimate how much the activity would cost. He responded in the neighborhood of \$100,000 a year but that this investment could be transferred in total to an international resource center were one to be established. Thus at such time as it was made functional the center would already have a functioning structure from which to disseminate soils fertility information.

4. Establish formal, substantive linkages with international centers.

The observation was made that the institutions with which it was proposed to establish linkages under this item were all in South America. The point was made that AID wished linkages to be established on a world-wide basis.

Dr. Sanchez explained that indeed this was true. He said that this was because NCSU's predominant expertise in soils was in the LA region. He believed that NCSU might best tie up with some other university under the soils consortium such as Hawaii which has expertise in Asia and that they might then link with the institutions in Asia. He believed that the same would hold true for Africa. Perhaps Prairie View could serve in the latter capacity.

Mr. Kitchell did not look at it in that light. He pointed out that NCSU already had established linkages in the U.S. and that its expertise should extend directly to nations in any part of the world where NCSU's knowledge and expertise could be used.

5. Cooperative research through former graduates.

Dr. Gill asked if in fact the research undertaken by former NCSU graduate students when they returned home could really be considered utilization.

Dr. Sanchez pointed out that former graduates trained at NCSU remained a part of the NCSU linkage system and that if they continued to work with their former NCSU graduate advisors, both parties continued to benefit from the association while the university could build up its pool of information and expertise. Dr. Sanchez gave the example of a La Molina expert who was a former NCSU student and is now doing research on how to use the jungle soils of Peru. He pointed out that this is utilization and that if the Peruvian technician is later assigned a U.S. graduate student with whom to work this too is utilization.

Dr. Sanchez was asked how long he felt grant funds should continue to be used in this way. He responded he believed such associations could justifiably be financed with grant funds as long as the grant might last.

Mr. Kitchell stated that Dr. Bernstein was very receptive to research proposals which link U.S. graduate students and Latin American experts in joint research projects, but he wondered if there might not be some way to finance these activities even where a grant did not exist.

Dr. Sanchez was of the opinion that a logical alternative approach to financing joint U.S./host government research and training would be through the A.I.D. loan programs in individual countries.

The writer was asked if he believed the IA Bureau would be willing to use the loan mechanism as a means of undertaking specific types of research in specific countries. He responded that this is already being done in certain instances. He gave as an example the CINTA loan in El Salvador. However, he pointed out this had to be at the discretion of each country. Most countries were not likely to want to use loan funds to do research which they considered was to build a U.S. university's capacity, but if it were proved first that meaningful achievements could be derived by such a method of operation they would no doubt approve.

6. Establishment of sabbatical leave for foreign experts at NCSU.

This proposal was thought of very highly. The question was asked why the 211(d) grant funds were not used for this purpose in the past. In fact no answer was given to the question.

The writer pointed out that not only foreign experts should be considered for sabbatical leave on the campus. Americans might also qualify if they had gained valuable expertise by serving for many years abroad and that it could be a valuable mechanism by which to bring back NCSU employees some of whom have served more than ten years overseas without a U.S. rotation.

7. Conduct a workshop for teachers.

The idea of host country workshops for teachers was considered a good idea and it was recognized that if the teachers were better informed on improved methods of soils use and if they were assisted to modernize the elementary soils courses taught in vocational schools it would benefit the country.

Both Dr. Gill and Mr. Kitchell pointed out that to single out teachers as a special group in need of training was in fact a parochial approach and that what was really required in regard to host country training would be a series of workshops or seminars at different levels so as to provide a balance of instruction in soils for different groups from the college level down to the farmer.

8. Conduct periodic workshops for NCSU soils scientists in the LICs.

This type of workshop was considered to be of very high priority. However, the recommendation was made that it be open to all qualified soils scientists, not limited to those who had been trained at NCSU.

II. Statement on obtaining clearance for multiple entry of specified technicians assigned to specific projects in specified IA countries.

The writer knows of no reason why individual clearance must be obtained before each entry when a named technician is assigned to a specific project activity in one or more specified IA countries. In fact there are numerous instances in which this procedure is being followed. A case in point is NCSU contract Ia-646. Each regional technician is assigned to two or more participating countries and may travel to them at any time simply by contacting the Rural Development Officer and getting his consent prior to entry. In each such case before this procedure can be agreed to, security clearance has had to be obtained for the university employee and the employee has been accredited to the specific country USOM where he is to provide assistance on a specified project. This could be a research project, technical assistance, or a 211(d) Grant. A request for such clearance should in each case be processed through the appropriate technical office of the Latin American Bureau. In the case of the NCSU 211(d) Grant that would be IA/ER/RD.

III. Position Paper: The outputs which the IA Bureau would hope to see obtained from the NCSU 211(d) Grant were the grant to provide NCSU a facility for becoming the resource base of soil fertility linkages in Latin America.

The writer sees no need for an international center for soils research such as IRRI serves for rice, CIMMYT for corn and wheat, or CIP for potatoes. It is the IA Bureau's view that all international centers should be located in the lesser developed countries. We do see how NCSU can serve a valuable function as a soils resource base making use of an AID 211(d) Grant.

To serve its maximum utility both on the home campus and in AID's constituent countries, NCSU's soil facility needs to be closely allied through a tight linkage system with (a) AID's consortium of universities working on soils, (b) the consortium working in water utilization, and (c) the International Centers for research on specific crops and cropping systems.

The IA Bureau sees no reason why specific universities should not gain their expertise in defined areas, thus NCSU might well specialize in Latin America, Hawaii in Asia, and possibly Prairie View in Africa.

The information gained in any one area should, of course, pass along the network system so that experience gained in one area can be used in all. NCSU should when its particular expertise is needed in another area, be expected to serve in that other area even if the 211(d) Grant builds its facility on campus by experience in the Latin American region.

The 211(d) grants have been the subject of considerable criticism from the Bureaus because it has been felt that the AID grant money went into the development of facilities which benefitted U.S. universities but had little relationship to the development of LDCs in their home territories. The Bureaus should be pleased indeed if it is now to be AID policy that the 211(d) Grants shall be evaluated both on the facilities they have developed on university campuses at home and on the utilization that is being made of these facilities in the development of host countries. This would overcome a good deal of the objection the IA Bureau has seen in such grants.

In its capacity of building a soil fertility research and technical assistance facility at Raleigh, making use of experiences and utilization outputs in the Latin American region, the IA Bureau feels the following to be of high priority:

(a) NCSU should serve as a training institution both on the Raleigh campus and in host countries. On the campus it should train soils fertility technicians from the host countries to be better prepared back home. It should serve U.S. technicians who wish Latin American experience for work in Latin American countries or in other tropical regions. In the host countries it should provide short courses, workshops, and conferences for persons working in soils fertility at different levels of skill, i.e. school teachers, extension agents and technicians.

(b) Through the network system the University should establish a close relationship with soil fertility specialists, both graduates of NCSU and those of other universities, both U.S. and foreign, with soil fertility expertise. Through cooperative programs with such persons, both the host country and the NCSU facility would be improved.

(c) NCSU graduate students should be encouraged to work with foreign soils fertility experts abroad with 211(d) financial assistance. On completing their dissertations such men would prove to be valuable staff employees either at NCSU or at other American universities.

(d) NCSU should use the 211(d) Grant to build "sister" institutions in the LDCs, working with them so that both the host government institution and NCSU will gain mutually from the experience. Under the 211(d) Grant, NCSU might well consider facilitating its Soils Department faculty the chance to serve their sabbaticals in an LDC. Outstanding LDC soils technicians should equally be considered for serving their sabbaticals on the NCSU campus with 211-d Grant funds.

(c) The experiences gained overseas should be made widely available both in the IA region and in the tropical areas of the world through the network system. All(d) funds could serve a valuable function were they to be used for the translation of pertinent papers into English, Spanish, French, and Portuguese. At the same time a newsletter could be published periodically to disseminate special articles and matters of importance in the field of soil fertility.

It is felt that the experiences gained in any particular tropical area should be shared world wide. This need not be the major goal of any one institution. It should, however, be the function of the network if it is to operate successfully in the manner that AID conceives.