

PD - AAT - 121

ISA 44589

SORGHUM/MILLET CRSP

1982 EEP REVIEW REPORT
1984 AID/W MANAGEMENT REVIEW REPORT
AND
1984 EEP REVIEW REPORT

931-1254

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PREPARED FEBRUARY, 1985
SORGHUM/MILLET CRSP ME

ME SUMMARY OF
RECOMMENDATIONS AND
ACTIONS TAKEN

SUMMARY

Sorghum/Millet 1982 and 1984 EEP Reviews and 1984 AID/W Management Review Recommendations Where a Consensus is Indicated 1/

<u>Recommendations</u>	<u>Sorghum/Millet CRSP Action Taken</u>
* Increase Millet Research Relative to Sorghum Research	CRSP goal is 70 percent sorghum, 30 percent millet effort. Millet is increased from 11.3 percent in Year 6 to 21.4 percent for Year 7.
* Increase Overseas Based CRSP Input Relative to Domestic Based	The CRSP goal is 50-50. The overseas based program budget is increased to a proposed 37.6 percent in Year 7 from 22.1 percent in Year 6. Funding in and in behalf of host countries is 73.3 percent of the Year 7 budget. This was 63.2 percent for Year 6.
* Increase Research Input in Africa Relative to Other Ecogeographic Areas	The goal is to direct 65 percent of research in Africa. This was 54.8 percent in Year 6 and 61.8 percent is proposed for Year 7.
* Improve CRSP Communications, Internally and Externally	Deliberate effort has been made to improve communications. Communications with institutions is through the Institutional Representatives.
* Complete a Global Plan with Emphasis on Prime Sites, Zonal Approach and an Increased Level of Collaboration	A Global Plan for the next five years has been done. Six ecogeographic zones targeted with collaborative research emphasis
* Complete Reports and an Annual Travel Plan	A procedure for a CRSP travel plan is in process. A 5-Year Technical Research Report and a Research Highlights Report has been completed. Plans are in process for a Year 6 Annual Report.
* Reorganize EEP and Involve the EEP on a Continuous Basis	The EEP was reorganized. Actions have been taken to involve the EEP on a continuous basis with information, representation at PI meetings, site visits, etc.
* Increase Program Concentration-Projects, Sites, Institutions, Management	The proposed actions starting Year 7 and the Global Plan of research specify program direction.
* Strengthen ME Program Management, Relationships and Budget Control	The Board of Directors has taken action to strengthen program management with appointment of a full time Director and Associate Director.
* Contribute to Host Country Research Institution Building through CRSP Training, Information Exchange Workshops, and Scientist Exchange.	The CRSP is a collaborative research program but also gives high priority to contributions made to improved host country national sorghum and millet research programs.

RECOMMENDATIONS AND ACTIONS
TAKEN WITH EACH REPORT

EXTERNAL EVALUATION PANEL REVIEW
KANSAS CITY, MISSOURI
FEBRUARY 1-5, 1982

RECOMMENDATIONS

That one or two senior professional staff from ICRISAT always be present at review meetings.

That the Director be empowered to invite sorghum/millet workers not presently being supported from INTSORMIL funds to attend these meetings.

That ICRISAT Sorghum/Millet Physiologists be invited.

Consider possible alternative ways of conducting these reviews. More informal sharing and exchange of ideas and experiences would be of greater value.

Rather than review the whole operation of the CRSP, it may be better to go more deeply into some particular aspects of the work at each review than trying to deal with the whole program in depth on every occasion.

The Board consider the interval of time which should elapse between reviews. Annual meetings may well be too frequent now that such an excellent start has been made.

Strongly urges AID support of the amounts suggested of 3.6 million for Year 5 and 4.25 million for Year 6 which in fact represents no increase over year four assuming 10% inflation.

Continuity of funding is essential. Failure to fulfill the complete funding obligations already entered into by AID would do serious damage to the program and could be permanent.

EEP welcomes the appointment of a part-time assistant director. Essentially to be involved in operations in Botswana.

SORGHUM/MILLET CRSP ACTION TAKEN

This was done in 1982. It was not done in 1984. ME supports the idea of invitation with ICRISAT paying travel as INTSORMIL does with representatives at ICRISAT reviews.

The ME is not limited with this if needed and a potential contribution.

No action taken.

Agree that continuous evaluation and improvement is needed. 1984 review included host country site visits.

Continuous involvement of the EEP and separate discipline reviews. Agree with this. The CRSP proposes a triennial review in FY 1988.

EEP is now involved on a continuous basis with EEP review meetings scheduled to meet roll forward grant funding.

INTSORMIL funding has not kept pace with inflation and funds needed to develop global collaborative research activity.

Accepted point.

Program now has a full-time Director and full-time Associate Director. Botswana program is established with two research PI's on site.

RECOMMENDATIONS

Welcomes the intention to include the University of Georgia under this CRSP. Believes reduction in number of universities included for reasons of administrative tidiness alone would deny the services of many talented people.

Discourage INTSORMIL Sorghum Breeding activities at country level in Mexico (Self sufficient opportunities)

Seek ways of cooperating with other USAID schemes, with ICRISAT, and other donor agencies, to mount the sustained research effort required to control Striga.

Increased cooperation and joint planning sessions occasionally with International Centers so that maximum of complementary activity may be attained, without duplication of effort.

INDIVIDUAL PROJECTS

MSU-3 Results which promise to be interesting be written up and reviewed by the Honduras Committee.

PRF-1 West Africa: A synthesis of available socio-economic information relating to agriculture in the Sahelian countries be prepared. Research on market development and price policy is of top priority. Project to be directed by excellent professionals and carried out by graduate students who speak French or are otherwise knowledgeable on overseas conditions. Should be encouraged and hopefully extended to other geographic regions.

KSU-3 India: Time-table be established to permit collection of necessary data and project financing be provided throughout the necessary period.

Agronomy

UN-11 Presently not funded. Because of location interaction, it seems imperative that the research be done on location in the particular LDC(s), and if this condition met we recommend funding.

SORGHUM/MILLET CRSP ACTION TAKEN

The trend is to concentrate the program rather than bring in additional institutions. Georgia is not included in the CRSP.

Collaborative breeding program with Mexico is at a very low level of funding.

Accepted point. INTSORMIL has not shown enough initiative here.

Communication and cooperation with IARCs, particularly CIMMYT, CIAT, ICRISAT and IRRI is excellent.

Project terminated, FY 1985.

Project terminated, FY 1983.

Project terminated, FY 1984.

Project terminated, FY 1982

RECOMMENDATIONS

- MSU-1 Duplicates the work of Peacock at ICRISAT in India, has no formal linkages and may be too technical for practical application. Suggest project be re-oriented in collaboration with Peacock to avoid duplication or be dropped.
- KSU-6 Millet stand establishment - essential but relevant only to situation in LDCs. Emphasize most of research should be done in LDCs.

SORGHUM/MILLET CRSP ACTION TAKEN

Project terminated, FY 1984

Action taken to strengthen project with collaboration in Niger and Sudan.

Plant Physiology

Encourage as much direction as possible to be given to short-term and direct application of both basic and applied projects. Expressed concern as to applicability of basic research to on-going research in LDC's.

Basic physiology research input reduced.

- UN-2 Project objectives - Emphasizing temperature, yield and water stress interactions are significant in much of the world in relation to sorghum/millet production. Encourage as much application as possible be made in the LDC's plus the continuation of drought screening work at Garden City. Concern exists as to the validity of the gradient system as it interacts with additional soil moisture availability and climatic conditions. Encourage multiple evaluation such as Yuma and Garden City to better classify materials with a necessary third test being in the LDC's. Corn comparisons be confined to non-INTSORMIL funding.

Project restructured as part of UN-16 FY 1983.

- UN-1 Water relations project is sound but could use international linkages which will require less sophistication and ability to handle much larger numbers. Considering level of expertise and basic oriented research perhaps more of this with other international centers would be a first step as well as cooperative efforts with the breeding activities.

Project restructured as part of UN-16 FY 1983.

RECOMMENDATIONS

- UN-8 Climatology effort can hopefully involve even more overseas linkages than the Philippines, Tanzania, and Colombia. Project should be made to relate to the similar but more extensive work done at ICRISAT.
- KSU-2 Direct application as in UN-2 may need to go through international centers and in collaboration with breeders.
- AU-1 More international linkages should be encouraged. (Plant physiology portion)

SORGHUM/MILLET CRSP ACTION TAKEN

- Project terminated end of FY 1985.
- Project terminated end of FY 1985.
- Project terminated end of FY 1985.

Plant Breeding

- UA-1 More coordination needed with the drought resistance breeding work at Texas, ICRISAT, and even the drought physiology work at Nebraska. Testing and evaluation of elite germplasm selected in this project at LDC sites where drought is a major problem should strengthen linkages with LDC's. Project terminated end of FY 1985.
- KSU-1 Only INTSORMIL project working on pearl millet breeding. Direct usefulness of germplasm developed at Kansas for most of the LDC's questioned. Developing a collaborative testing and evaluation site in an appropriate country in West Africa would strengthen this project. Work on heritability and gene action in pearl millet is not high priority for immediate food production needs of the LDC's. Strong collaborative research established with Sudan.
- MSU-2A This project appears to lack focus and is spread out too thinly to have significant impact in the LDC's. Work on A1 toxicity is being handled by several others in this CRSP, coordination and collaboration with the other projects in this effort appears necessary. More examination of these issues may help to narrow down and focus this project into areas of direct use to the LDC's. Work on armyworm may be of value to LDC's and work on stem-borer at a location in an LDC in Africa would be of great value. Restructured in Year 4 into MSU-4-5 and 6 with research objectives in line with LDC constraints.

RECOMMENDATIONS

- UN-7 Basic work on comparative sorghum breeding methodologies with emphasis on recurrent selection is very important. Project should be encouraged to continue. However, the lack of sufficiency of a breeding method for use in LDC's sites is of concern. Efficiency of breeding method for use in LDC's should be viewed in terms of speeding the breeding progress, the inclusion of off-season work would appear useful. Good linkage opportunity for this project.
- TAM-21 More vigorous effort in distributing lines and hybrids from this project to more LDC's may be useful.
- TAM-22 Area of drought resistance breeding it appears necessary to have more coordination with ICRISAT, Arizona, and Nebraska, all of which are actively working on this problem of the LDC's in the SAT. Another area which needs close coordination with other projects is the work in A1 toxicity.
- TAM-23 Shift of emphasis to stem borer resistance breeding would be most useful. In area of breeding for N and P efficiency, closer coordination with others working on this problem (particularly Nebraska) would appear useful.

Utilization and Nutrition

More detail on home preparation methods for both cereals would be desirable. Effects of alkaline cooking (lime or ash) and of fermentation processes on chemical composition, functional properties, and nutritive value need study. Nutrients other than protein and calories should not be forgotten.

More nutritional quality evaluations are needed especially millet.

SORGHUM/MILLET CRSP ACTION TAKEN

This project was restructured as UN-15 with linkage in Botswana and Tanzania.

This was done with TAM-21 (Miller) becoming a highly rated breeding project.

This has been done with the LDC emphasis in Honduras and Sudan. Excellent collaboration has been established.

Collaboration with Nebraska and Niger established. Peterson breeding aspects restructured.

EEP comments taken into consideration by PI's.

New project, millet food quality, approved for FY 1986.

RECOMMENDATIONS

- TAM-26 Utilization of sorghum as food, alone or in combination with other foods - more effort should be made to implement the various technologies developed - information valuable in developing countries. More work or similar work should be done on millet. Information should be made available to investigators in agronomy, physiology and breeding, as well as to those concerned with socio-economic problems.
- KSU-5 Cholesterol is not a problem in the developing world. (Nutritive Quality using guinea-pigs, animals not conventional for this type of work). Project concerned mainly with millet. More conventional methodologies should be used to evaluate this grain.
- MSU-3 Research basic to projects on production and utilization. More details needed on preparation and consumption. Sorghum samples should have been obtained for evaluation. No mention of other groups of INTSORMIL engaged in Honduras.
- FAM-1 Circumstances hindered the operation of project, since so little reported. Director should inquire into the nature of these hindrances and determine the prospects of this project being carried out effectively.

Plant Pathology

- TAM-24 Panel recommends continued major support for this project.
- MSU-2B Panel recommends continued support. Only project dealing with sweet sorghums (sorgos) and nematode problems.
- PRF-2 Project has been totally revamped to emphasize anthracnose of sorghum. Project has merit provided strong cooperation is established with breeding projects, particularly PRF-3. In addition to the stated objectives, and overseas linkage can be established in addition to Egypt.

SORGHUM/MILLET CRSP ACTION TAKEN

This has been done to some extent. INTSORMIL has a continuous job in bringing researchers together with a team approach.

Project terminated, FY 1984.

Project Terminated, FY 1985.

Project terminated. Florida A&M inactive status. Propose discontinue from CRSP end of FY 1985.

Continued.

Project discontinued end of FY 1985.

Project discontinued, FY 1982.

RECOMMENDATIONS

UN-10 Primarily directed to sorghum virus diseases. Questioned about importance and relevance, since a strong, well established program (TAM-24) exists in Texas which has established overseas linkages and integration with other disciplines. INTSORMIL Director to provide guidance to the leader of UN-10 to help establish a meaningful program which would include cooperation with breeding projects and collaboration with TAM-24.

Entomology

TAM-25 Panel recommends continued support about the same level.

MSU-2B TAM-25 appears to involve sufficient expenditure and effort for research on midge. Work with fall armyworm seems to be warranted under MSU-2b since moderate resistance to armyworm attack is reported in sorghum. Panel recommends midge work within MSU-2b be discontinued and TAM-25 take full responsibility for midge.

KSU-4 Only project dealing with storage and preservation of p/m grain. Recommends its continuance although at a lower level of funding since a great deal of the descriptive work has already been done. Urge research with fumigants, as the practice is deployed on farmsteads in several developing countries. More imaginative approach to the solution of the problems would be desirable.

SORGHUM/MILLET CRSP ACTION TAKEN

Some changes as per EEP recommendation. Project discontinued FY 1985, with opportunity to compete for new pathology project that fits Global Plan of Research.

Continued, strong project.

Project restructured into other projects with better defined research objectives.

Project terminated, FY 1984. New project proposed on stored insects with collaboration with Sudan FY 1986.

SUMMARY OF PROJECT ASSESSMENTS

RECOMMENDATIONS

A majority of the projects were relevant and good. Some would benefit from better integration into the program.

KSU-1 does need a site in the developing world: and the heritability gene action studies do not seem relevant to the LDC's.

MSU-2 is wide-ranging: it should concentrate on a single problem.

FAM-1 has made but little progress.

MSU-1 needs to be redesigned to complement the ICRISAT work.

A system to allow for limited funding outside the present projects at participating or home participating universities which would be administered by the Director would be helpful.

Review committee members need to be updated on any changes in funding, projects, staff involvement, etc.....

SORGHUM/MILLET CRSP ACTION TAKEN

A continuous process. Improvements made.

Collaboration established with Sudan.

Restructured.

Discontinued, FY 1982

Discontinued, FY 1985.

LDC contingency fund proposed for Year 7.

Continuous involvement of EEP and communication improved.

AID/W MANAGEMENT REVIEW REPORT
MARCH 1984

RECOMMENDATIONS

- a. Reevaluate and prioritize constraints to sorghum/millet production, processing, marketing and consumption.
- b. Select principal countries for a fully integrated interdisciplinary program for sorghum and millet production, processing, and marketing. Geographic and ecological regions should be considered.
- c. Develop global plan.
- d. Select secondary countries to form regional networks of cooperation. Also include international and regional agricultural research centers.
- e. Reconstitute External Evaluation Panel with emphasis on broad experience, both domestic and international, availability and commitment. Provide for ad hoc peer review committee by discipline. Establish criteria and scope of work for EEP, TC, discipline and country coordinators.
- f. Complete annual report including Years 2, 3 and 4. Make plans for a 5 year summary as Year 5 Annual Report.
- g. Evaluate CRSP internal communication process for improvement between ME and sub-grant institutions, between institutions and with EEP.

SORGHUM/MILLET CRSP ACTION TAKEN

Done with discussion and input from host countries related to developing Global Plan.

Prime sites have been selected for 6 ecogeographic zones and approved by the Board of Directors with a lead U.S. Institution named for each zone.

Done. Gives direction and guidelines of Sorghum/Millet CRSP collaborative research.

Done - Collaborative and potential sites for research collaboration with prime sites have been selected.

Done - but needs continuous input. TC proposed to concentrate on technical matters. Proposed to establish a Prime Site Country Coordinators Council for program and budget recommendations.

Completed Research Highlights and 5 year Technical Report. Have not completed annual reports. Question usefulness and quality of attempting to reconstruct past events. Have process in place and put priority on Annual Report for Year 6 (1985) and for succeeding years.

Progress. Current mode of management operation is one of open communication with no hidden agenda. ME communicates through and/or keeps Institutional Representatives informed.

EXTERNAL EVALUATION PANEL TRIENNIAL REVIEW
SEPTEMBER 1984

RECOMMENDATIONS

Program would need to gradually develop all appropriate collaborators but no longer adhere to the past "shotgun" or "chance" arrangement of linkages.

Past due Global Plan and need for stronger direction by the ME, TC, and Board should improve the direction and stability of CRSP.

New panel (EEP) members be fully briefed by ME, TC, and Board prior to any review and be provided with appropriate hard copy well in advance of said review. The Chairman of the EEP and ME should have ample opportunity to discuss procedures and objectives with the committee before as well as after the review.

EEP Panel favors a more private session with PI to better delve into important topics not easily discussed before a large group of peers. Prefer one on one with PI rather than a group review.

Base reviews on a country basis and perhaps hold these on site at prime country project locations.

Continuous information between reviews is essential for EEP to remain or become current.

Seven of 32 projects need significant redirection or termination.

Discounting graduate or developed countries, world hectares of millet are equal or exceed sorghum yet this review shows very little change from previous two reviews to correct this very pronounced discrepancy of input on millet. More overseas input on millet is required. A project such as KS-6, should move its efforts to country projects e.g. Mali, Niger or the Sudan.

SORGHUM/MILLET CRSP ACTION TAKEN

Sorghum/Millet CRSP Global Plan of Research provides guidelines for program emphasis and direction. It can be changed but only with deliberate analysis and justification.

Completed.

ME recognizes need to have EEP informed and briefed. 1984 EEP review required EEP reconstruction and review implementation without sufficient time for planning and orientation. 1984 Review provided EEP with CRSP reports and budget information that was not made available to the EEP at earlier reviews. Have the objective of keeping EEP informed and involved on a continuous basis. Will improve future reviews.

Will be considered when plans are made for the next review.

This will be given high priority consideration.

This is in process. Publications, newsletters, and other EEP involvements are being carried out.

Refer to list of "Sorghum/Millet CRSP Research Projects Questioned by the EEP" and actions taken.

Millet input increased - 3 new millet projects added. Funding increased from 11.3% millet in Year 6 to 21.4% in Year 7. Sorghum, Millet CRSP has a goal of 30% millet and 70% sorghum research.

RECOMMENDATIONS

More "in-country" activity including student research in their home country.

More coordinated effort can only occur with inter-institutional cooperation at home and overseas. Approach overseas goals as a team effort rather than a project or institution goal. Duplication of activity can be reduced through coordination.

Need for Global Plan. Shotgun approach to overseas linkages can be relieved by stated priorities followed by both the ME and PI's. Not only should ecological areas be considered but also specific countries in need of immediate attention to alleviate famine.

Linkages have relied heavily on former students. Valid but ongoing, more experienced staff in the overseas country will offer more opportunity for research input from both a political and operational standpoint. Short term training of this category of scientist to update techniques and knowledge should be instituted along with graduate programs which will be increased with the SADCC program with ICRISAT

Utilization group should prepare a publication containing current methodology related to various kinds of physical, chemical, and nutritional evaluation methods. Publication could be used by breeders, etc. in LDC's where scientific literature is difficult to obtain.

Closer cooperation with AID missions could expand the PI's understanding as to opportunities and constraints as well as lead to more practical research planning. Country files should be readily available to brief PI's, ME staff, and EEP members prior to travel. Re: Good understanding of the country from a social, political and economic viewpoint as well as scientific.

As overseas activities increase, more need for a strong input to this CRSP from AID/Washington. To avoid future oversights of the kind that have hindered it in the past.

SORGHUM/MILLET CRSP ACTION TAKEN

The CRSP is moving this direction with emphasis on prime and collaborative host country sites and increased input based in host countries.

This is recognized to be important. There has been an increase in inter and intra institutional cooperation. Special efforts are made to complement other sorghum/millet research such as at ICRISAT.

Global Plan has been completed.

INTSORMIL works with host country scientists as available. In some locations there is a need for trained people and their support. Short term training is primarily the responsibility of ICRISAT. INTSORMIL's SADCC Training is a degree training program.

This will be discussed and implemented at the CRSP PI Conference February 20-21, 1985, Lubbock, Texas.

The trend has been to increase positive relationships with Mission. The ME keeps and shares host country files with PI's and others traveling.

Program -- input in S&T/AGR is important.

RECOMMENDATIONS

Duplication of effort normally should be avoided such as if ICRISAT supports strong millet improvement in Niger, INTSORMIL could better place such input elsewhere.

Students entering INTSORMIL funded training be from host countries or those who make a long-term commitment to work in such countries

Strongly supports increased input and funding for Striga control and acid soils if the state of the art is such that control of Striga or developing crops for aluminum toxicity conditions is a reasonable possibility.

Improved cultivars need increase and distribution. Encourages cooperation and input from local or international seed organizations.

The ME be given more authority over INTSORMIL input and budgeting and that the ME take a stronger position to expedite the objectives of this CRSP to avoid stalemates caused by project or institution loyalties.

Encourages a level and type of research in the LDC's to be compatible with current levels of expertise, culture, and need. More applied approach will generally be in order for the host country.

Future overseas visits by the EEP would benefit from the presence of the country coordinator and representation by key disciplines.

SORGHUM/MILLET CRSP ACTION TAKEN

ICRISAT has a regional research program. Sorghum/Millet CRSP works collaboratively with National program scientists - the results are research output and institution building.

The CRSP trains a wide range of students who do provide research input. U.S. students develop an interest in international careers.

Active research in the Cali/Northern South America ecogeographic zone with acid soils toxicity. Some project work on Striga - Gebisa (Purdue), Hamdoun (Sudan) Berhe (Sudan). Sudanese student in U.S. training for Ph.D. on Striga. Sponsored Striga workshop at NCSU. Magnitude of problem requires large funding resources in addition to sorghum/millet program.

INTSORMIL has input and communication with seed industry.

Institutional loyalties and discipline loyalties are very strong. However, ME recommendation and Board actions are leading to significant changes in the CRSP for Year 7 and beyond.

We are responding to this with Board decision to look at Agronomy/Cultural Practices as a separate discipline group and a relative increase in cultural practices research.

This is part of the INTSORMIL plan to involve EEP on continuing basis.

RECOMMENDATION

Country reports suggested sprinkler irrigation gradient to be established in Niger. Considerable concern expressed as to effectiveness of such a screen for a selection tool. Urge - evaluation be made among known genotypes at given location as well as between U.S. and overseas location using conversions where necessary to adequately evaluate exotic germplasm.

More involvement of social sciences in CRSP. Collaboration by this group (or with biological sciences) must be on more permanent basis and take advantage of "in country" talent.

Collaborative sessions regarding a specific discipline or country. Coordinate input and state of art. Example - plant physiologists draft model for drought tolerance based on moisture scenarios with this being framework for modification as more is understood.

Encourage PI's to cultivate strong relationship with AID Missions.

More advance planning with the ME as regards future evaluations. Points to be covered need to include country evaluations, panel membership, type of evaluation, background information, and objectives of the review. Sub-dividing EEP responsibilities was less effective because of insufficient advance information and instructions. Strongly suggest the next review to be a one on one session versus group meetings.

Expertise from the U.S. but non-INTSORMIL institutions exists and should be utilized in an adjunct capacity with regard to millet, Striga, and acid soils.

SORGHUM/MILLET CRSP ACTION TAKEN

Stressing overseas testing. Have discontinued Arizona gradient project.

A higher level of collaboration is being stressed. The need for some micro economics research related to technology evaluation is recognized.

This will be discussed and hopefully implemented at the February 20-21, 1985 PI Conference.

This is being done. Most Missions are positive. Niger mission requests that PIs give a seminar for Mission staff as part of trips.

Recognize needed changes in review process. The ME learned from the 1984 review. 1984 review even with some problems was evaluated by most as an improvement over the 1982 EEP review.

INTSORMIL does not intend to fund or include all sorghum/millet research in its program. Adjunct relationships will be used where they contribute to the program. For example, NCSU has been an active collaborator with Striga. Dr. Burton (Georgia) was used as an EEP consultant on millet for the 1984 EEP review.

RECOMMENDATIONS

CRSP can link with other CRSP activities or basic research supported by AID such as on acid soils at Colorado State. Relationship to farming systems projects and the soils CRSP can benefit INTSORMIL.

Start-up country programs terminated within Global Plan, they must be phased out gradually and politically in the viewpoint of the host country. At all times the principal objective should be to look at the application of research to a significant ecological area.

Questions level of input going into Mexico - graduate country rather than LDC. Subsidize large government seed research and distribution agency in competition with many private seed organizations producing and distributing improved seed - much of which appears to be imported from U.S.

Supports Global Plan - delineation of prime centers to concentrate input and better accomplishments. Emphasis on the Sahel area of Africa. Caution against too great an infusion of temperate germplasm into tropics.

SORGHUM/MILLET CRSP ACTION TAKEN

This has started. Further relationships can be established. TROPSOILS and INTSORMIL have a joint MOU with Mali.

This is being done.

Level of input is low. Some PI's would like to have higher. Direction is for very little input. The prime site for this area is Honduras.

Global Plan recognizes this point.

**SORGHUM/MILLET CRSP RESEARCH PROJECTS QUESTIONED BY THE EEP
SEPTEMBER - 1984**

<u>Principal Investigator</u>	<u>Project</u> ^{1/}	<u>Rating</u> ^{2/}	<u>Actions Taken</u>
Dr. Mary Futrell	MSU-3	2.7	Discontinued end of FY85. PI retiring.
Dr. Ed Kanemasu	KSU-2	2.5	Discontinued end of FY85.
Dr. Phil Abbott	PR-5	2.2	Project reoriented to microanalysis and strengthened. Added PI Dr. John Sanders.
Dr. Ralph Neild	NE-8	3.5	Discontinued end of FY85.
Dr. Max Clegg	NE-13	2.5	Host Country Collaboration strengthened. Funds increased to fund added collaborative cultural practices research with Botswana.
Dr. Jerry Eastin/ Dr. Charles Sullivan	NE-16	2.0	Funding reduced.
Dr. Dale Anderson	NE-17	2.0	Project will continue with funding to complete research with graduate students through Year 8. Economics may be reoriented to host country economic evaluation of technology.
Dr. Vicki Marcarian	AZ-1	2.0	Discontinued end of FY85. PI going overseas with Arizona program
Dr. Herman Warren	PR-6	2.0	Discontinued end of FY85.
Dr. Larry Busch/ Dr. Milt Coughenour	KY-1-2	2.0	Project will continue.
Dr. Richard Vanderlip	KSU-6	2.0	Strengthened collaborative ties with Sudan and Botswana. Funds increased to strengthen collaborative cultural practices research.
Dr. Ralph Clark/ Dr. Jerry Maranville	NE-14	2.0	Project will continue.
Dr. Allen Kirleis	PR-3B	1.5	Project will continue.

^{1/} Two projects were reviewed by the EEP that were already terminated. They were MSU-1 and KSU-4. A new stored sorghum/millet insects project to replace KSU-4 is proposed at Kansas with collaboration in Sudan starting FY86.

^{2/} Overall EEP project ratings were:

1.0 = Continuation with no major changes.
2.0 = Continuation with recommended changes.
3.0 = Continuation only identified major changes.
4.0 = Terminate the Project.

USAID/MISSION RESPONSES
FOR
1984 EEP REVIEW

COPY OF TELEX SENT TO
USAID MISSIONS REQUESTING
INPUT FOR 1984 EEP REVIEW

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TO: LANCE JEPSON, ADD */NIGER*

SORGHUM/MILLET CRSP (INTSORMIL) IN PROCESS OF TRIENNIAL PROGRAM REVIEW BY EXTERNAL EVALUATION PANEL. WOULD LIKE INPUT FROM YOU REGARDING:

- 1) ASPECTS OF SORGHUM/MILLET CRSP RESEARCH SUPPORT THAT HAVE GONE WELL AND HAVE CONTRIBUTED.
- 2) PROBLEMS WITH THE CRSP MANAGEMENT AND/OR RESEARCH SUPPORT ACTIVITIES, AND
- 3) OPPORTUNITIES FOR FUTURE INVOLVEMENT OF SUBJECT CRSP. PLEASE REPLY BY TELEX. NEED RESPONSE BEFORE SEPTEMBER 10, 1984. APPRECIATE YOUR INPUT

REGARDS
VOLLMAR
PROGRAM DIRECTOR

UN INTPRG LCN

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INPUT FOR 1984 EEP REVIEW

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TELEX NUMBER 993

TO: GLENN VOLLMAR, PROGRAM DIRECTOR

FM: A. MACKIE ADO. USAID/BOTSWANA

APPRECIATE YOUR REQUEST FOR INPUT FOR TRIENNIAL PROGRAM REVIEW OF SORGHUM/MILLET CRSP (INTSORMIL.)

1. SORGHUM/MILLET CRSP TEAM FOR BOTSWANA HAVE ARRIVED, ARE SETTLED AND HAVE JUST DEVELOPED RESEARCH PLANS FOR THEIR FIRST SEASON. MANAGEMENT SUPPORT TO DATE HAS BEEN EXCELLENT. SPECIAL APPRECIATION EXPRESSED FOR EFFORDS OF L.V. WITHEE, CAMPUS COORDINATOR. PREMATURE TO EXPRESS VIEWS OF SUCCESS OF LOCAL INTSORMIL PROGRAM.

2. PROBLEM AREAS WITH MANAGEMENT AND/OR RESEARCH SUPPORT ACTIVITIES WOULD INCLUDE.

(A) LESS RESTRICTIVE USES OF REVOLVING FUND WOULD EASE PROBLEMS OF LOCAL PROCUREMENT. WHEN INDICATED FOR LOCAL SERVICE, RAPID PROCUREMENT OF LOCAL MANUFACTURE O IMPLEMENTS.) MINOR DEFERENCES BETWEEN STATE UNIVERSITIES ON ALLOWABLE PROCUREMENT PROCEDURES BECOME DIFFICULT FOR FIELD STAFF TO ADMINISTER.

(B) A SMALL BUDGET FOR SUPPORT OF LOCAL INITIATIVES TO BE USED WITH JOINT APPROVAL OF CRSP MANAGEMENT AND LOCAL ADO WITH MINIMAL PAPERWORK REQUIREMENTS WOULD BE EXTREMELY USEFUL. FYI. PROCUREMENT OF IRRIGATION EQUIPMENT FOR LOUIS MAZHANI APPEARS TARDY AND DIFFICULT TO ACCOMPLISH.

(C) AN APPROPRIATE BALANCE SHOULD BE REACHED BETWEEN U.S. AND OVERSEAS ACTIVITIES, ESPECIALLY IN TRAINING OF GRADUATE STUDENTS. FOREIGN GRADUATE STUDENTS SHOULD RECIEVE SUPPORT FOR DATA GATHERING ABROAD. U.S. STUDENTS PLANNING CAREERS IN INTERNATIONAL CROP RESEARCH REQUIRE OVERSEAS SXPERIENCE.

3. (A) FURURE INVOLVEMENTS OF SUBJECT CRSP WILL AHVE TO BE CLOSELY COORDINATED WITH SADCC AND ICRISTAT DEVELOPMENTS IN REGION.

(B) WITH LOCAL SHORTAGE OF UNIVERSITY GRADUATES IN AGRICULTURE, DISCUSSIONS ON WHETHER TRAINING FUNDS COULD BE USED FOR LIMITED UNDERGRADUATE TRAINING FOLLOWED BY GRADUATE TRAINING WOULD BE BENEFICIAL.

REGARDS,
ANITA MACKIE. ADO. USAID/BOTSWANA

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INPUT FOR 1984 EEP REVIEW

UNIVERSITY OF NEBRASKA
ATTN: GLENN VOLLMAR
PROGRAM DIRECTOR INTSORMIL
LINCOLN, NEBRASKA 68583-0722

REF: (A) TELEX FROM VOLLMAR TO CERNIK
(B) JACKSON/SMITH TELCON 9/10/84

1. OUR RESPONSE TO QUESTIONS POSED REF A. FOLLOWS:

A) WE BELIEVE ASPECT OF SORGHUM/MILLET CRSP RESEARCH WHICH HAS PRODUCED FINEST RESULT IS WORK WITH SORGHUM POTENTIAL IN TOXIC SOILS, ESPECIALLY THAT SHOWING HIGH DEGREE (65 PERCENT) ALUMINUM TOXIDITY. EVIDENCE OF CRSP CONTRIBUTION LOCALLY IS THAT ICA APPARENTLY INTENDS TO RELEASE EARLY PRODUCT (TECHNOLOGY) OF THIS RESEARCH FOR COMMERCIAL USE IN 1985.

B) RELATIVELY FEW PROBLEMS EXIST WITH CRSP MANAGEMENT, WHICH BENEFIT CONSIDERABLY FROM INTERNATIONAL NETWORK OF COUNTRIES (VENEZUELA, PERU, BRAZIL) ESPECIALLY INTERESTED THIS RESEARCH. ONE POTENTIAL DIFFICULTY INCLUDES APPARENT PROBLEM WITH IMPORTATION OF SORGHUM -- FOR RESEARCH PURPOSES -- INTO U.S. HOWEVER, CIAT OFFICE MANAGING CRSP ANTICIPATES THAT U.S. UNIVERSITIES WHICH ARE RECIPIENT OF THAT SORGHUM WILL BE ABLE TO RESOLVE SAME.

C) FOR FUTURE, CRSP SHOULD CONTINUE TOXIC SOIL FOCUS, REFINING RESEARCH TO INCLUDE SPECIFIC PROBLEMS WITH DISEASE, INSECTS, ETC.

AMERICAN EMBASSY BOGOTA, COLOMBIA 10030 1188L

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DISCONNECTED 15-Sep-84 07:50 56 MSG 35

23

29/August/84

FOR: INTSORMIL EEP Review

FROM: Glen J. Vollmar, INTSORMIL Program Director

Telephone call from Mr. Sam Taylor, USAID representative Mexico, American Embassy Mexico, in response to TELEX received regarding INTSORMIL Collaborative research.

1) Contribution

Yes - very interested in the program. Establishes a valuable linkage between U.S. and Mexican research institutions and CIMMYT. Very supportive. Not able to discuss details of contribution but aware that there has been INTSORMIL collaboration in Mexico. Encourages more.

2) Problem Areas

Really no problem areas with management. Commented that they have no concern of quality of any collaborative work with CIMMYT or that provided by the U.S. INTSORMIL institutions. Would like to see fullest use made of farm trials and the germ plasm that is available out in the country.

3) Future

Would like to see as much training of Mexican sorghum scientists as possible. USAID/Mexico has some funds and would like to have proposals and discussion in regard to training support for identified, qualified persons. Recommend that sorghum/millet scientists stop in at the Embassy and talk with him about their research activities and interests.

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DR' VOLLMAN
UNIVERSITY OF NEBRASKA
LINCOLN, NEBRASKA 68583
TEL: (402) 472-6032
TELEX 488-340 UNL

1. ASPECTS OF INSORMIL CRSP THAT HAVE GONE WELL AND CONTRIBUTED TO PROGRAM IN NIGER ARE A) LONGER TERM VISITS OF PLANT BREEDERS TO EXCHANGE IDEAS WITH NCR AND INRAN PROJECT PLANT BREEDERS AND B) THOSE DEALING WITH CEREAL QUALITY AND BIOLOGICAL CONTROL OF STEM BORERS IN SORGHUM.

2. PROBLEMS: DURATION OF STAY BY INSORMIL SCIENTISTS, WHICH IS OFTEN ONLY A MATTER OF DAYS RAISES SERIOUS QUESTIONS AS TO WHAT THEY CAN ACCOMPLISH IN SUCH SHORT PERIODS OF TIME. ARE THE TRIPS MOSTLY FOR THE BENEFIT OF INSORMIL SCIENTISTS OR ARE THEY ACTUALLY HELPING MISSION PROGRAMS?

3. OPPORTUNITIES FOR FUTURE INVOLVEMENT. INSORMIL SHOULD CONSIDER HAVING FEWER BUT LONGER-TERM STAFF VISITS IN NIGER, SUCH IS THE CASE WITH TROPISOILS, RATHER THAN RELYING SOLELY ON SHORT-TERM VISITS. THE RESULTS OF WHICH ARE SOMETIMES QUESTIONABLE. INSORMIL SHOULD ALSO CONSIDER NIGERIAN SCIENTIST VISITING U.S. INSTITUTIONS INVOLVED IN RELEVANT RESEARCH ACTIVITIES. THE STREET SHOULD BE TWO WAYS.

USAID MISSION TO NIGER
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TELEGRAM

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AIDAC

PASS TO PROGRAM DIRECTOR VOLLMOR, CRSP

E. O. 12356: N/A
SUBJECT: SORGHUM/MILLET CRSP (INTSORMIL) TRIENNIAL
PROGRAM REVIEW

REF: VOLLMAR/EDWARDS TELEX OF AUG. 28

1. GOP COUNTERPARTS GENERALLY VERY SUPPORTIVE OF SORGHUM/MILLET CRSP AND LOOK FORWARD TO INCREASED COOPERATION. THERE IS SOME FEELING THAT LONG-TERM ADVISOR ASSIGNED IN LOS BANOS MAY NOT HAVE BEEN FULLY UTILIZED BECAUSE OF ORGANIZATIONAL PROBLEM.
2. USAID APPRECIATES EFFORT ON PART OF SORGHUM/MILLET CRSP TO SEEK MISSION CONCURRENCE FOR ACTIVITIES AND TO KEEP MISSION INFORMED OF STATUS OF ACTIVITIES IN PHILIPPINES.
3. PARA 3 OF REF TELEX GARBLED. BOSWORTH



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Telex

DR. GLEN VOLLMAR, INTSORMIL DIRECTOR
UNIVERSITY OF NEBRASKA, LINCOLN
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
241 KEIM, EAST CAMPUS
LINCOLN, NEBRASKA 68583

1. MISSION APOLOGISES FOR DELAY IN RESPONDING TO VOLLMAR
TELEX. SENEGAL HAS NOT YET DEVELOPED A RELATIONSHIP AND
PROGRAM WITH THE SORGHUM/MILLET CRSP. COWPEA AND PEANUT
CRSP PROGRAMS ARE, HOWEVER, ACTIVE IN SENEGAL AND GOS.
AGENCIES HIGHLY REGARD THE LINKAGES DEVELOPED WITH US
UNIVERSITIES AND THE EXPERTISE PROVIDED.

2. GOS AGENCIES PREFER THAT US RESEARCHERS HAVE A
GREATER FRENCH SPEAKING ABILITY THAN HAS BEEN THE CASE
WITH SOME OF CRSP PERSONNEL. ROLE OF USAID IN MONITORING
EXPENDITURES AND ASSISTING IN PROCUREMENT MUST BE LIMITED
FOR CRSP PROJECTS.

3. THERE ARE SEVERAL POSSIBILITIES FOR FUTURE
INVOLVEMENT OF SORGHUM/MILLET CRSP IN SENEGAL. THE CRSP
PROJECT COULD ASSIST ISRA (NATIONAL AGRICULTURAL RESEARCH
AGENCY) IN SORGHUM/MILLET RESEARCH ACTIVITIES BY
PROVIDING TECHNICAL EXPERTISE AND ACCESS TO PLANT
MATERIALS AND NEW VARIETIES HAVING POTENTIAL FOR
PRODUCTION IN SENEGAL.

IN ADDITION, MISSION IS FUNDING A MILLET PROCESSING
PROJECT TO DEVELOP MILLET-BASED FOODS FOR URBAN CONSUMERS
AND ASSESS MARKET DEMAND. USAID HAS HAD PREVIOUS
CONTACTS WITH KANSAS STATE UNIVERSITY TO IDENTIFY
MECHANISM FOR SUPPORT TO THIS RESEARCH EFFORT. MISSION
AND GOS LOOK FORWARD TO OPPORTUNITY TO WORK WITH
SORGHUM/MILLET CRSP IN THE FUTURE.

FROM JOHN MCMAHON
USAID/SENEGAL
TELEX: 517 AMEMB SG
AMERICAN EMBASSY
DAKAR SENEGAL 9599 1861L

Telex
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ICS IFLDOSA WSHZ
795 STATE DEPT WASHINGTON DC
PMS
G. VOLLMAR
DIRECTOR, INTSORMIL
UNIVERSITY OF NEBRASKA
241 KEIM
LINCOLN, NE 68583

RESPONSES KEYED TO YOUR QUESTIONS:

1. THOSE ASPECTS OF THE CRSP DIRECTLY RELATED TO THE HYBRID SORGHUM PROGRAM (I.E. THE CRSP-SPONSORED WORKSHOP LAST FALL), T. BERHE'S RESEARCH ON SORGHUM/MILLET IN N. KORDOFAN, AND THE REAVES-FRANKENBURGER REPORT HAVE ALL PROVEN EXTREMELY USEFUL.

2. THE BASIC PROBLEM WITH CRSP MANAGEMENT DERIVES FROM THE NATURE OF THE CRSP AGREEMENTS. THEY ARE SIGNED BY THE CRSP MANAGEMENT ENTITY AND THE HOST COUNTRY RESEARCH ORGANIZATION. NORMAL BILATERAL AGREEMENTS ARE SIGNED BETWEEN USAID AND THE MINISTRY OF PLAN. THIS HAS CAUSED DELAYS IN THE CRSP PROGRAM, E.G., ONE PROPOSED CRSP AGREEMENT STATED THAT THE LAWS OF THE STATE OF NEBRASKA HAD TO BE FOLLOWED. RECOMMEND THAT A STANDARD CRSP AGREEMENT BE DEVELOPED FOLLOWING THE MODEL OF AID'S STANDARD PROJECT AGREEMENT.

3. USAID'S PROGRAMMATIC EMPHASIS IN THE COMING YEARS WILL CONTINUE TO BE ON IMPROVED SEED, WITH SPECIAL ATTENTION TO ASSISTING THE PRIVATE SECTOR WITH THE DEVELOPMENT OF SEED PRODUCTION INDUSTRY. INTSORMIL, IN NEGOTIATING SUBSEQUENT ACTIVITIES WITH THE GOS, SHOULD BEGIN WITH AN INQUIRY FIRST OF USAID'S PRIORITIES, THEN THE GOS' AND FINALLY THEN IDENTIFY WHERE THESE INTERSECT WITH INTSORMIL'S OWN PRIORITIES. IF DONE OTHERWISE, ONE OF THE INVOLVED INSTITUTIONS MAY SIMPLY ACCEPT ASSISTANCE, BUT WITHOUT SUFFICIENT COMMITMENT TO PUSH THE WORK ALONG.
AMERICAN EMBASSY KHARTOUM SUDAN 11014; 2951L

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1984 EEP REPORT

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INTSORMIL TRIENNIAL REVIEW-SEPTEMBER 1984

Introduction

At the beginning of year six of the Sorghum/Millet CRSP a three location review took place at Lincoln, Nebraska, College Station, Texas, and West Lafayette, Indiana. Disciplines covered by location were:

Lincoln, Nebraska: Agronomy and Plant Physiology

College Station, Texas: Plant Breeding and Genetics, Plant Pathology, and Entomology

West Lafayette, Indiana: Grain Quality and Nutrition, Economics and Sociology

Members of the External Evaluation Panel (EEP) were as follows:

<u>Panel Member</u>	<u>Review Location</u>	<u>Specialty</u>
Dr. Glenn Burton	C.S.	Millet and grass breeding, Georgia
Dr. Brhane Gebrekidan	C.S.	Sorghum breeding, Kenya
Dr. Clark Harvey	C.S.	Crop production, Texas Tech
Dr. Nancy Gonzalez	W.L.	Anthropology, U. of Maryland
Dr. Ricardo Bressani	W.L.	Nutrition, Guatemala
Dr. Glen Johnson	W.L.	Ag Economics, Michigan State U.
Dr. John Monyo	L.N.	Plant breeding, Roma, Italy
Dr. Bruce Maunder (chm)	L.N.	Sorghum breeding, Lubbock, Texas

Following the discipline reviews on September 9-11, the EEP members assembled for discussions with the Technical Committee, Global Plan Committee, Board of Directors, and Management Entity as well as minimal time for EEP discussions at Lincoln, Nebraska on September 12-14. In addition to the above mentioned scientists and administrators directly involved with the CRSP we were pleased to also have in attendance from AID/Washington, Dr. Anson Bertrand and Dr. Bob Jackson, from BIFAD, Dr. Fred Johnson, and from the University of Nebraska, Chancellor Martin Massengale and Vice Chancellor Roy Arnold.

INTSORMIL, a complex organization of more than 80 scientists primarily located at seven U.S. Land Grant Colleges (U. of Nebraska, U. of Kentucky,

Arizona State U., Kansas State U., Mississippi State U., Purdue University, and Texas A & M) serves a global function of increasing sorghum and millet productivity and nutrition as well as utilization. As an AID program this CRSP strives for an LDC orientation while following AID research policy and objectives.

Rather significant developments suggest progress is occurring with this CRSP designed to especially affect the 80% of the sorghum area which produces no more than 50% of the crop and the majority of this for human consumption plus nearly all the millet producing area of the world--some 43 million hectares. For example, a \$30,000 investment in the November, 1983, Sudan Hybrid Workshop has led to a \$1½ million AID input into sorghum hybridization in that country. A \$5,000 Philippine government interest in sorghum has increased to \$133,000 following the establishment of INTSORMIL projects in that country. Botswana, a country heavily dependent on sorghum; a country with one million people subsisting on 30,000 hectares of harvested sorghum (100,000 planted) and a yield of only 155 kg/ha compared to a U.S. yield of 3,775 kg/ha now have two on site U.S. scientists, local U.S. trained collaboration, a new project (KSU-7) plus several ongoing projects all designed to increase productivity.

This CRSP works in 20 or more LDC's with overseas collaboration and funding showing a slow but rapidly increasing growth. Somewhere near \$1.4 million of the \$3.6 million budget directly affects overseas projects with of course many of the individual U.S. projects directly applicable to international linkages, especially as related to training. The allocation of this same budget by discipline shows:

breeding	32%
physiology	19%
nutrition	10%
pathology	9%
economics-sociology	9%
entomology	4%

A critical issue among principal investigators (PI's) as well as between institutions relates to allocation of a rather fixed annual fund and must be done with the success of INTSORMIL as the principal criteria.

No doubt the first five years of this CRSP have seen a fusion under one Management Entity of much of the top public sorghum research talent, a nucleus of scientists that AID desired to support and should consider a very good buy at \$3.650 million/year. With little initial overseas linkage or assistance in establishing such, criticism has often suggested many programs to be merely using INTSORMIL as a granting agency without responsibility to the overseas component. Four ongoing projects, however, were funded in part by AID, and taken into the sorghum/millet CRSP in 1979. These projects: (1) millet breeding (KSU), (2) sorghum stress physiology (NU), (3) sorghum quality and nutrition breeding (PU), and (4) sorghum insect and disease breeding (TAM), should show strong leadership and make some of the earliest contributions. Early on training of international students has accounted for much of the progress--some 199 INTSORMIL students--with 96 of these from other countries and these potential candidates for current and near future linkages.

The Review Committee certainly accepts the premise that this program would need to gradually develop all appropriate collaborators but no longer adhere to the past "shotgun" or "chance" arrangement of linkages. The past due Global Plan and need for stronger direction by the ME, TC, and Board should improve the direction and stability of this CRSP.

Constraints to the External Evaluation

Of the eight people involved in the review only three had previous experience with this CRSP with fortunately one at each of the three review centers. We would strongly suggest new panel members be fully briefed by

the ME, TC, and Board prior to any review and be provided with appropriate hard copy well in advance of said review. Whereas the materials provided were indeed useful and much improved over previous reviews their "night before" distribution and rather voluminous contents were somewhat overwhelming to especially the newer members. The Chairman of the EEP and ME should have ample opportunity to discuss procedures and objectives with the committee before as well as after the review.

Concern was expressed as to the effectiveness of a group review as opposed to more of a one on one discussion between the panel and PI. Generally, the panel favors a more private session to better delve into important topics not as easily discussed before a large group of peers.

Whether the discipline review split was effective versus all panel members hearing all projects was not resolved. A suggestion, perhaps very appropriate, was made to next base reviews on a country-basis and perhaps even hold these on site at prime country project locations. Also essential to any future approach will be the willingness of panelists or appropriate scheduling by the ME to assure full participation throughout the review. Only five of the eight attending members could schedule a full week for this evaluation while two had valid reasons for not participating at all.

The evaluation sheet was difficult to use but more objective perhaps than the past statement approach which lacked an overall recommendation of much magnitude. The PI's generally used this form to prepare their written reports which were extremely useful for later reference. The absence of much host country reviewing or on site project reviews hindered this evaluation. Projected visits to the Sudan, India, and Central America-Mexico were cancelled for various reasons. Only Tanzania, Botswana, and Colombia were adequately reviewed. Plans, however, call for near future visits to

the Sudan, Mexico, Honduras, Mali, and Niger. These country reports will be added to this review as soon as available. Also, continuous information between reviews is essential for the EEP to remain or become current. The willingness of Dr. Glenn Burton and Dr. Clark Harvey to act as active reviewers on a consulting basis was greatly appreciated.

The content of this review will essentially fall under two categories: (1) evaluations and (2) recommendations. The following evaluations have been grouped by disciplines rather than institutions. This approach allows the grouping to relate to the specific review location which will be College Station, Lafayette, and Lincoln, respectively. We felt somewhat inadequate in the request to comment on host country and U.S. management input. Also because of a floating project numbering system there was no way to evaluate response to previous review recommendations. An inexperienced reviewer might assume this lack of project continuity to suggest a previous project either being completed or non-productive and thus terminated when actually the project was re-organized. Future changes would be more descriptive, at least for review, if both old and new project numbers were included. No doubt the most important rating on the following sheets would be the overall evaluation. A one or two can be considered satisfactory to very good while a three would be in need of significant modification, and a four is probably not effective for this CRSP.

Project: AZ-1 Evaluation & Development of S&M Germplasm
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) _____
- c. International Center(s) S
- d. U.S. Institutions HS
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: screening technique good

Deficiencies: linkage needs to be strengthened

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (2)

Reviewer's Comments: Be sure results of screen appropriately sort for best drought resistance; suggest known tolerant material be screened. Also should evaluate best local varieties preferably in the country but for sure at SIG location using conversions to avoid height and photoperiod confounding.

Evaluation scale on next page.

The items within each of the seven categories are to be assessed using scales as follows:

A. Five-Point Category Evaluation Scale (for Items 1 through 3 e, 4 and 6):

Within a project each category should be judged to be Exceptional (E), Highly Satisfactory (HS), Satisfactory (S), Less than Satisfactory (LS), and Unacceptable (UA) If not applicable, rate as (NA).

B. Contribution to Development and Domestic Improvement (for items 3 f. and 3g)

Evaluate on the basis of Limited (L), Potentially Important (PI), Showing a Contribution (SC)

C. Project Strengths/Deficiencies (for Item 5)

Use brief descriptive statements.

Overall Project Recommendation for Item 7):

Each project should be given one of four recommendations: 1) continuation with no major changes, 2) continuation with recommended changes, and 3) continuation only with identified major changes and 4) terminate the project.

Project: KS-1 Expansion of pearl millet program at Fort Hays
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops LS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) E
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Only millet program, large cooperative program.

Deficiencies: More publication needed

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: (MS-4) Sorghum host-plant resistance & genotype evaluation
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) E
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: well balanced program, regionally important

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: MS-11 Adaptation of sorghum to highly acid tropical soils

Name EEP Reviewer: Burton, Harvey, Grebrekidan

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) E
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: excellent international linkage

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: - on site screening at various levels of liming proves to be effective screening.

- highly successful workshop held in May, 1984

- need close linkage with NE-14

Project: NE-15 Sorghum breeding

Name EEP Reviewer: Burton, Harvey, Gebrekidan

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops E
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: comparison of breeding methods excellent

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

21

Project: PR-7 Strengthening outreach work in sorghum p
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures _____
- b. Consistency of Objectives with Activities HS for objective B4
- c. Achievement of Project Research Objectives _____
- d. Training/Institution Building _____
- e. Publications/Information Dissemination/Workshops _____
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) _____
- g. Contribution to Domestic Sorghum/Millet Improvement _____

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines _____

5. Project Strengths/Deficiencies

Strengths: excellent progress on developing B4 objective

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations _____

7. Overall Project Recommendation (1)

Reviewer's Comments: Too early to rate progress on some objectives

Project: TX-21 Breeding for productivity in sorghum

Name EEP Reviewer: Burton, Harvey, Gebrekidan

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1 Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities E
- c. Achievement of Project Research Objectives E
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) SC
- g. Contribution to Domestic Sorghum/Millet Improvement SC

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: excellent well balanced research program

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: Suggest local adapted germplasm not be overlooked but merely improved through introgression from world collection.

Project: _____
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities E
- c. Achievement of Project Research Objectives E
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: excellent research

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) _____
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Well balanced research program

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: IX-25 Development etc. Integrated pest management.
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities E
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building E
- e. Publications/Information Dissemination/Workshops E
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country E
- b. USAID Mission(s) _____
- c. International Center(s) E
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Excellent comprehensive research

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: (KS-4) Storage and preservation of P.M. and sorghum
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country LS
- b. USAID Mission(s) _____
- c. International Center(s) LS
- d. U.S. Institutions LS
- e. Among Disciplines LS

5. Project Strengths/Deficiencies

Strengths: excellent research in a very important area

Deficiencies: lack of LDC linkage

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1 for item) 14 in report (future research direction)

Reviewer's Comments: Suggest reactivation of this project with suitable linkages be considered.

Project: MS-5 Bio investigation & management & fall army worms
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: well balanced program on important problem.

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: MS-6 Sorghum disease resistance evaluation
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) _____
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: only research dealing with root problems

Deficiencies: results not consistent with objectives

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: (NE-10) Identification of genes controlling sorghum MDMV
Name EEP Reviewer: Burton, Harvey, Gebrekidan
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) _____
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: excellent basic virus research

Deficiencies: linkages need strengthening

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: (PR-6) Mechanisms of disease resistance, etc.

Name EEP Reviewer: Burton, Harvey, Gebrekidan

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures S
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops LS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) _____
- c. International Center(s) LS
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: _____

Deficiencies: linkages inadequate

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (2)

Reviewer's Comments: _____

Project: (TX-24) Sorghum and millet pathology

Name EEP Reviewer: Burton, Harvey, Gebrekidan

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country _____
- b. United States _____
- c. Collaboration _____

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building E
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) _____
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: excellent research on very important problems

Deficiencies: _____

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (1)

Reviewer's Comments: _____

Project: KY 1 and 2
Name EEP Reviewer: Gonzalez, Bressani, Johnson
Date 9/12/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country S
- b. United States HS
- c. Collaboration S

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement L

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) HS
- c. International Center(s) HS
- d. U.S. Institutions S
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Brings sociological point of view to INTSORMIL through imagination, insight, and excellent local relations.

Deficiencies: Not providing adequate "feed forward" from sociology to bio/physical scientists working on sorghum technology--need to attract locals for training and/or collaboration.

6. Response to Prior EEP and AID/W Review Recommendations

7. Overall Project Recommendation (2)

Reviewer's Comments: Closer relationships with other INTSORMIL projects needed--why no collaboration in Honduras with Futrell? Considerable overlap in objectives, yet neither mentions the other's study. Danger of being over-extended--especially DeWalt's. Sociological component seems weaker than one would expect on basis of reputation of researchers. Frankenberger's contribution excellent.

Project: NE 17 Economic Analysis - Philippines
Name EEP Reviewer: Gonzalez, Bressani, Johnson
Date 9/12/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____ too early to judge

2. Technical Personnel

- a. Host Country S
- b. United States S
- c. Collaboration S

3. Project Progress

- a. Scientific Research Procedures too early to judge
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives too early to judge
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops too early to judge
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) -
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: Looking at market potential before doing research is good
Deficiencies: Too early to judge

6. Response to Prior EEP and AID/W Review Recommendations

7. Overall Project Recommendation (2)

Reviewer's Comments: If Anderson not personally committed to Philippines perhaps he could contribute in alternative project already ongoing. If Philippines continued then this project evaluation market and utilization e.g. substituting sorghum for corn in livestock rations seems desirable.

Project: PR-5 Production, Policy, and Institutional Issues
Name EEP Reviewer: Gonzalez, Bressani, Johnson

Date 9/12/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country LS
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country LS
- b. United States S
- c. Collaboration LS

3. Project Progress

- a. Scientific Research Procedures S
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives LS
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) L
- g. Contribution to Domestic Sorghum/Millet Improvement L

Linkages and Collaboration

- a. Host Country LS
- b. USAID Mission(s) NA
- c. International Center(s) NA
- d. U.S. Institutions LS
- e. Among Disciplines LS

5. Project Strengths/Deficiencies

Strengths: Competence with techniques of economists

Deficiencies: Does not appear well related to bio/physical research on problems of countries, farmers, and housewives.

6. Response to Prior EEP and AID/W Review Recommendations

7. Overall Project Recommendation (2.2)

Reviewer's Comments: Recommend focus on:
(1) isolating and defining sorghum related problems of government and especially farmers and housewives
(2) contributions economists can make to multidisciplinary problems and study of subjects germane to solution of such problems.
Papers cited mostly not related to results of research.

Project: MS-3 Nutrition ImprovementName EEP Reviewer: Gonzalez, Bressani, JohnsonDate 9/12/84SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country S
 b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country S
 b. United States S
 c. Collaboration S

3. Project Progress

- a. Scientific Research Procedures LS
 b. Consistency of Objectives with Activities S
 c. Achievement of Project Research Objectives S
 d. Training/Institution Building LS
 e. Publications/Information Dissemination/Workshops LS
 f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
 g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country LS
 b. USAID Mission(s) S
 c. International Center(s) S
 d. U.S. Institutions LS
 e. Among Disciplines LS

5. Project Strengths/Deficiencies

Strengths: Sensitivity to local customs - good in country relations, suggests interdisciplinary approach

Deficiencies: Needs re-orientation of problems; inadequate host country collaboration; scientific merit as indicated by publication record seems inadequate.

6. Response to Prior EEP and AID/W Review Recommendations7. Overall Project Recommendation (2.7)

Reviewer's Comments: Lacks host country student training--grad students are from other countries; would benefit from increased collaboration with DeWalt and with consumption economics specialists. Project needs to better focus on problems involving sorghum, millet, nutrition. Need is to identify the nutritional dimensions of practical problems and then to bring nutrition research to bear on those problems. Project has unexploited potential to "feed forward".

Project: PR-3 Utilization and Breeding

Name EEP Reviewer: Gonzalez, Bressani, Johnson

Date 9/12/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country HS
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country HS
- b. United States E
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops E
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI-SC
- g. Contribution to Domestic Sorghum/Millet Improvement PI-SC

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) S
- c. International Center(s) HS
- d. U.S. Institutions E
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Technical capacity and scientific quality plus good integration with other bio/physical disciplines.

Deficiencies: Need social science input - could have greater overseas component.

6. Response to Prior EEP and AID/W Review Recommendations

7. Overall Project Recommendation (1)

Reviewer's Comments: Represents heart of sorghum project making available materials needed for other research objectives: in production and breeding; in utilization research; in feeding trials with animals and humans. Suggest native definitions of food quality be systematically studied and considered.

Project: PR-3B

Name EEP Reviewer: Bressani and Johnson

Date 9/12/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country S
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country HS
- b. United States E
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities E
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) S
- c. International Center(s) S
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Excellent collaboration within U.S. -- strong focus on chemical/physical/nutritional attributes of grain sorghum -- utilization among disciplines.

Deficiencies: Needs more LDC involvement

6. Response to Prior EEP and AID/W Review Recommendations _____

7. Overall Project Recommendation (1.5)

Reviewer's Comments: Project is developing kind of information in food product development i.e. acceptability characteristics--which should be available to breeders as well as processors. Also helping to explain problems in nutritional value of sorghum--protein digestibility and quality. Many LDC students should be involved.

Project: PR-4B High Tannin Utilization

Name EEP Reviewer: Gonzalez, Bressani, Johnson

Date 9/12/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country _____
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country _____
- b. United States E
- c. Collaboration S

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities E
- c. Achievement of Project Research Objectives E
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI-SC

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) -
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Technical capacity and knowledge as well as collaboration with other disciplines.

Deficiencies: Need for more host country collaboration

6. Response to Prior EEP and AID/W Review Recommendations _____

7. Overall Project Recommendation (1)

Reviewer's Comments: Good dissemination of information. Are there scientists in LDC's who can make a relevant contribution? Need to increase training component. Results from studies already applicable to tannin problems e.g. with beans.

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country -
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country -
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building NA
- e. Publications/Information Dissemination/Workshops E
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) NA
- c. International Center(s) NA
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Focus on objectives--good coordination and bio/physical science disciplines; technical capacity of PI

Deficiencies: not enough host country participation

6. Response to Prior EEP and AID/W Review Recommendations

7. Overall Project Recommendation (1)

Reviewer's Comments: Project is providing information on ways to make better use of HT sorghums through understanding mode of action of tannin. More host country institutions or students should participate in this research.

Project: TX26 Food and Nutritional Quality of Sorghums
Name EEP Reviewer: Gonzalez, Bressani, Johnson
Date 9/12/84

SORGIUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country -
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country HS
- b. United States E
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops E
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) -
- c. International Center(s) HS
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: Related to LDC conditions as project attempts to utilize sorghum in food product development for LDC countries--strong technical capacity.

Deficiencies: No attention to millet though report says it is being considered more significant in part if part of research performed in LDC country.

6. Response to Prior EEP and AID/W Review Recommendations

7. Overall Project Recommendation (1)

Reviewer's Comments: Need close coordination with Purdue project in context of problems faced by farmers and housewives--since many students trained could do more work in host countries--contributions from this project both on basic and applied sides are very important in the better use of sorghum as food. Efforts to incorporate processed sorghum flours into maize flours and other food preparations highly commendable. Excellent dissemination of information. Other applications should be developed based on food products consumed in LDC's.

Project: KS-1-1 Tereke Berhe Sudan Project
Name EEP Reviewer: Monyo, Maunder
Date 9/10/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country HS
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country HS
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) SC
- g. Contribution to Domestic Sorghum/Millet Improvement L

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) HS
- c. International Center(s) N/A
- d. U.S. Institutions HS
- e. Among Disciplines HS

5. Project Strengths/Deficiencies

Strengths: On site, applies to varietal selection, stand establishment, cultural practices, and intercropping

Deficiencies: lack of vehicle - equipment

6. Response to Prior EEP and AID/W Review Recommendations N/A

7. Overall Project Recommendation (1)

Reviewer's Comments: Should include Hagen Durra-1 in cultural studies.

Project: KS-6 Seedling vigor and stand establishment
Name EEP Reviewer: Monyo, Maunder
Date 9/10/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country S
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country HS
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures S
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement L

Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) S
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: work done w/good scientific input and supervision
many LDC trainees
Deficiencies: not on location - need more linkage
should work at more LDC countries

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (2)

Reviewer's Comments: _____

Project: KS-7 Cultural practices in Botswana
Name EEP Reviewer: Monyo, Maunder
Date 9/10/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country HS
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country HS
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives N/A
- d. Training/Institution Building H/S
- e. Publications/Information Dissemination/Workshops N/A
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement L

4. Linkages and Collaboration

- a. Host Country E
- b. USAID Mission(s) E
- c. International Center(s) N/A
- d. U.S. Institutions HS
- e. Among Disciplines IIS

5. Project Strengths/Deficiencies

Strengths: on farm - direct application in Botswana

Deficiencies: difficult to get equipment

6. Response to Prior EEP and AID/W Review Recommendations -

7. Overall Project Recommendation (1)

Reviewer's Comments: too early to evaluate - began in March
relate to NE 13

Project: MS-1 Seed factors influencing stand establishment
Name EEP Reviewer: Monyo
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country S
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country LS
- b. United States HS
- c. Collaboration CS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement L

4. Linkages and Collaboration

- a. Host Country LS
- b. USAID Mission(s) -
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines LS

5. Project Strengths/Deficiencies

Strengths: _____

Deficiencies: Lacks collaboration w/LDC's

6. Response to Prior EEP and AID/W Review Recommendations _____

7. Overall Project Recommendation (4)

Reviewer's Comments: _____

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Project: NE13 Agronomy and Cropping Systems

Name EEP Reviewer: Monyo, Maunder

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country S
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country HS
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement L

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) S
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: basic agronomy - good linkage - technical personnel

Deficiencies: utilization? - needs wide impact - not enough work in LDC's

6. Response to Prior EEP and AID/W Review Recommendations -

7. Overall Project Recommendation (2.5)

Reviewer's Comments: \$75,000 funding must affect LDC's besides Botswana - must fuse with KS-7. Results location specific - methods fairly well defined based on previous work and ICRISAT studies - suggest more of this type research be done in LDC's.

Project: NE-8, NE-22 Agroclimatology and Dominican Republic Project
Name EEP Reviewer: Monyo, Maunder
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country HS
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country S
- b. United States S
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures S
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building S
- e. Publications/Information Dissemination/Workshops S
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement L

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) N/A
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines N/A

5. Project Strengths/Deficiencies

Strengths: Trying to promote sorghum, LDC students trained in analysis acid use of meteorological data

Deficiencies: work in non-sorghum areas - hasn't applied work in volume area, not innovative scientific inquiry

6. Response to Prior EEP and AID/W Review Recommendations -

7. Overall Project Recommendation (3.5)

Reviewer's Comments: marginal contribution - more of a diagnostic analysis than research - look at past data - provides valuable service. Should make planting date recommendations for LDC's. Should look at potential for double cropping in tropics during dry season.

Project: KS-2 Stress Physiology

Name EEP Reviewer: Monyo, Maunder

Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1 Project Administration

- a. Host Country _____
- b. INTSORMIL Institution _____

2. Technical Personnel

- a. Host Country S
- b. United States HS
- c. Collaboration S

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities S
- c. Achievement of Project Research Objectives S
- d. Training/Institution Building _____
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) S
- c. International Center(s) HS
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: strong basic scientific approach - cooperation with Berhe, ICRISAT, AZ.
a good number of LDC trainees.

Deficiencies: needs more application to LDC's and should work closely with breeding
projects.

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (2.5)

Reviewer's Comments: also has Striga funding; limit this basic work to only a few
institutions.

Project: NE14 Mineral element uptake - tolerance.

Name EEP Reviewer: Monyo, Maunder

Date 9/10/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country HS
- b. INTSORMIL Institution S

2. Technical Personnel

- a. Host Country HS
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures E
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building HS
- e. Publications/Information Dissemination/Workshops E
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country HS
- b. USAID Mission(s) S
- c. International Center(s) HS
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: excellent screening program - good linkage - team effort

Deficiencies: more collaboration in LDC's - needs more funds - more field verification

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (2)

Reviewer's Comments: need programmatic approach
could use more breeding support

Project: NE 16 Water and Temperature Effects Related to Stress
Name EEP Reviewer: Monyo, Maunder
Date 9/11/84

SORGHUM/MILLET CRSP PROJECT EVALUATION

Each project is to be assessed as feasible by the INTSORMIL External Evaluation Panel (EEP) in seven categories. The rating scales to be used are attached.

1. Project Administration

- a. Host Country HS
- b. INTSORMIL Institution HS

2. Technical Personnel

- a. Host Country HS
- b. United States HS
- c. Collaboration HS

3. Project Progress

- a. Scientific Research Procedures HS
- b. Consistency of Objectives with Activities HS
- c. Achievement of Project Research Objectives HS
- d. Training/Institution Building E
- e. Publications/Information Dissemination/Workshops HS
- f. Contribution to Sorghum/Millet improvement in the Host Country(s) PI
- g. Contribution to Domestic Sorghum/Millet Improvement PI

4. Linkages and Collaboration

- a. Host Country S
- b. USAID Mission(s) S
- c. International Center(s) S
- d. U.S. Institutions S
- e. Among Disciplines S

5. Project Strengths/Deficiencies

Strengths: US input - many students trained

Deficiencies: need cooperative breeder e.g. Andrews

6. Response to Prior EEP and AID/W Review Recommendations S

7. Overall Project Recommendation (2)

Reviewer's Comments: abscisic acid to promote limited moisture germination and
seedling vigor should be further evaluated as a major breakthrough. Saeed Farah is
competent collaborator in Sudan.

Recommendations

1. As per the previous "evaluation" section the EEP found 7 of the 32 projects needing significant re-direction or termination.
2. Discounting graduate or developed countries, world hectares of millet are equal or exceed sorghum yet this review shows very little change from the previous two reviews (1980, 1982) to correct this very pronounced discrepancy of input on millet. Because the crop essentially does not exist in the grain form in the U.S., much more overseas input on millet is required. A project such as KS-6, for example, should move its efforts to country projects e.g. in Mali, Niger, or the Sudan.
3. Perhaps 30% of the budgeting can be traced to overseas country linkages but only with considerable training input can the 50% or more program description be attained. We strongly urge more "in country" activity including student research in their home country.
4. To keep INTSORMIL at the top of priorities by PI's, a more coordinated effort can only occur with inter-institutional cooperation at home and overseas. The best possible talent should approach overseas goals as a team effort rather than a project or institution goal. Duplication of activity, such as crop rotation studies, can be reduced through coordination.
5. This review continually saw need for a Global Plan. The past shotgun approach to overseas linkages can be much relieved by stated priorities easily followed by both the ME and PI's. Not only should ecological areas be considered but also specific countries in need of immediate attention to alleviate famine.

6. We feel early linkages have relied heavily on former students. These are valid but ongoing, more experienced staff in the overseas country will offer more opportunity for research input from both a political and operational standpoint. Short term training of this category of scientist to update techniques and knowledge should be instituted along with graduate programs which will be increased with the SADCC cooperative program with ICRISAT. This CRSP is to be commended for organizing and conducting some 11 workshops, another form of institution building.

7. The INTSORMIL utilization group should prepare a publication containing current methodology related to various kinds of physical, chemical, and nutritional evaluation methods. Such a publication could be used by breeders etc. in LDC's where scientific literature is difficult to obtain.

8. Although we realize the PI's to be specialists there is great need while working overseas to have a good understanding of the country from a social, political, and economic viewpoint as well as scientific. Closer cooperation with AID missions could expand the PI's understanding as to opportunities and constraints as well as lead to more practical research planning. Country files should be readily available to brief PI's, ME staff, and EEP members prior to travel.

9. As overseas activities increase we see even more need for a strong input to this CRSP from AID/Washington. Hopefully strong assistance in this regard can better help INTSORMIL to avoid future oversights of the kind that have hindered it in the past.

10. We support a close relationship with such International Centers as ICRISAT and CIAT. Duplication of effort normally should be avoided such as if ICRISAT supports a strong millet improvement program in Niger, INTSORMIL could better place such input elsewhere. We are pleased to hear the positive feedback from International Centers as to the value of INTSORMIL.
11. The EEP recommends that students entering INTSORMIL funded training be from host countries or those who make a long-term commitment to work in such countries
12. The EEP questions the use of INTSORMIL funds to support the training of U.S. students.
13. The EEP strongly supports increased input and funding for striga control and acid soils if the state of the art is such that control of striga or developing crops for aluminum toxicity conditions is a reasonable possibility.
14. Improved cultivars need increase and distribution. We would encourage cooperation and input from local or international seed organizations. Government activity in this regard has generally proven to be less efficient.
15. To avoid stalemates caused by project or institution loyalties we would urge the ME be given more authority over INTSORMIL input and budgeting and that the ME take a stronger position to expedite the objectives of this CRSP
16. Whereas we can readily accept the heavier input of basic research with U.S. training we encourage a level and type of research in the LDC's to be

compatible with current levels of expertise, culture, and need. A more applied approach will generally be in order for the host country.

17. Future overseas visits by the EEP would benefit from the presence of the country coordinator and representation by key disciplines.

18. Country reports suggested a sprinkler irrigation gradient to be established in Niger. Considerable concern was expressed as to the effectiveness of such a screen for a selection tool. We strongly urge such an evaluation be made among known genotypes at a given location as well as between the U.S. and an overseas location using conversions where necessary to adequately evaluate exotic germplasm.

19. We strongly encourage more involvement of the social sciences in this CRSP. Collaboration by this group (or with the biological sciences) must be on a more permanent basis and take advantage of "in country" talent.

20. We encourage collaborative sessions regarding a specific discipline or country. All involved should coordinate their input and state of the art. For example, why not all plant physiologists draft a model for drought tolerance based on moisture scenarios with this being a framework for modification as more is understood. Certainly the breeder could benefit from such additional support.

21. We realize the misunderstandings with AID missions to be a thing of the past and encourage PI's to cultivate a strong relationship with these outposts of potential additional support such as in the Sudan. The practice of preparing a presentation to be used on trips should apply to these AID missions as well as research institutions in the host country.

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22. The EEP would encourage more advance planning with the ME as regards future evaluations. Points to be covered need to include country evaluations, panel membership, type of evaluation, background information, and objectives of the review. Sub-dividing EEP responsibilities was less effective because of insufficient advance information and instructions. We strongly suggest the next review to be a one on one session versus group meetings.

23. Expertise from the U.S. but non-INTSORMIL institutions exists and should be utilized in an adjunct capacity with regard to millet, striga, and acid soils.

24. This CRSP can link with other CRSP activities or basic research supported by AID such as on acid soils at Colorado State. Also a relationship to farming systems projects and the soils CRSP can benefit INTSORMIL directly.

25. Where a start-up program to establish sorghum must be weighted against improvement of large ongoing areas we feel consideration must be given as to where the budget can do the most good to improve food needs. Should start-up country programs be terminated within the new Global Plan they must be phased out gradually and politically in the viewpoint of the host country. Certainly a project can't be "country moving" often, e.g. depending on weather conditions, or they will soon wear out their welcome. At all times the principal objective should be to look at the application of research to a significant ecological area.

26. We question the level of input going into Mexico realizing Mexico to be a graduate country rather than LDC; to have a strong ICRISAT base of operations; and to subsidize a large government seed research and distribution agency in competition with many private seed organizations producing and

distributing improved seed--much of which unfortunately appears to be imported from the U.S.

27. We strongly support the Global Plan as regards its delineation of prime centers to concentrate input and better accomplishments. Certainly emphasis on the Sahel area of Africa is a worthwhile objective. When going to these prime centers we would caution against too great an infusion of temperate germplasm into the tropics.

28. The host country base of operations exhibited in Botswana, Sudan, Honduras and CIAT by INTSORMIL staff continually surfaces as a desirable approach to overseas collaboration, training, and research. The EEP commends this trend and the favorable response and accomplishments so generated.

29. We, the EEP, strongly encourage continued support be given for years 7-9 of the INTSORMIL CRSP. The above observations, determined over a limited time frame, will hopefully strengthen an already useful and potentially strong collaborative research support program.

Respectfully submitted by:

Dr. Brhane Gebrekidan
Dr. Nancy Gonzalez
Dr. Ricardo Bressani
Dr. Glen Johnson
Dr. Glenn Burton (consultant)
Dr. Clark Harvey (consultant)
Dr. Bruce Maunder (chairman)

APPENDIX I

Acronyms Appearing in the Preceding Report

AID	Agency for International Development
BIFAD	Board for International Food and Agriculture Development
CIAT	International Center for Tropical Agriculture
CRSP	Title 12 Collaborative Research Support Program
EEP	External Evaluation Panel
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
INTSORMIL	International Sorghum and Millet Research
LDC	Less developed country
ME	Management Entity
PI's	Principal investigators
SADCC	Southern African Development Co-ordination Conference
TC	Technical Committee

Washington DC, November 7-8, 1984

Dr. Bruce Maunder, INTSORMIL EEP Chair and Dr. Glen Vollmar, Director, and Dr. John Yohe, Associate Director, ME were in Washington November 7-8, 1984, for discussions with AID/W S&T Agr. staff, African Bureau staff, ICRISAT and CIAT Administrators. This meeting was a follow up of the 1984 EEP Review and was done while IARC administrators were meeting in Washington, DC.

AID/W S&T Agr. and African Bureau

The INTSORMIL representatives met with Mr. Cal Martin, African Bureau, Dr. Robert Jackson, S&T Agr. and Dr. Anson Bertrand, S&T Agr., Dr. Curtis Jackson (ICRISAT) and Dr. Les Swindale (ICRISAT), for a discussion of sorghum/millet research resources, research collaboration and research coordination in Africa. ICRISAT AND INTSORMIL's efforts compliment each other. Close coordination is vital. INTSORMIL's thrust is one of research collaboration and institution building whereas, ICRISAT is working with regional programs.

Discussions with IARC Administrators

The INTSORMIL representatives met with Dr. Curtis Jackson (ICRISAT) for a discussion of the SADCC Degree Training program and its implementation by INTSORMIL. Sorghum/millet research coordination was also discussed.

The INTSORMIL representatives met with Dr. Douglas Liang (CIAT) in regard to research with Mississippi State University INTSORMIL project MS-11 on sorghum production on acid soils.

Both of these meetings were productive and gave positive signals for further cooperation of INTSORMIL, CIAT and ICRISAT.

Mexico Trip Report

Date: October 18-24, 1984

EEP Participant: Nancie Gonzalez

INTSORMIL Participant: Billie DeWalt

Itinerary:

- Oct. 18 - Conference at CIMMYT including Vartan Guiragossian and Robert Osler
- Oct. 19 - ICRISAT personnel at CIMMYT, AID representative at Mexico City, and to Celaya
- Oct. 20 - Conference with Gabriel Vega of INIA and tour of his research; drive to San Luis Potosi and visit with Carlos Garcia, INIA
- Oct. 21 - Visit settlement being studied by DeWalt team and to Monterrey
- Oct. 22 - Sorghum Conference in Monterrey
- Oct. 23 - Sorghum Conference - depart 15:00 for Mexico City
- Oct. 24 - Attempted conference with Elias Calles, INIA

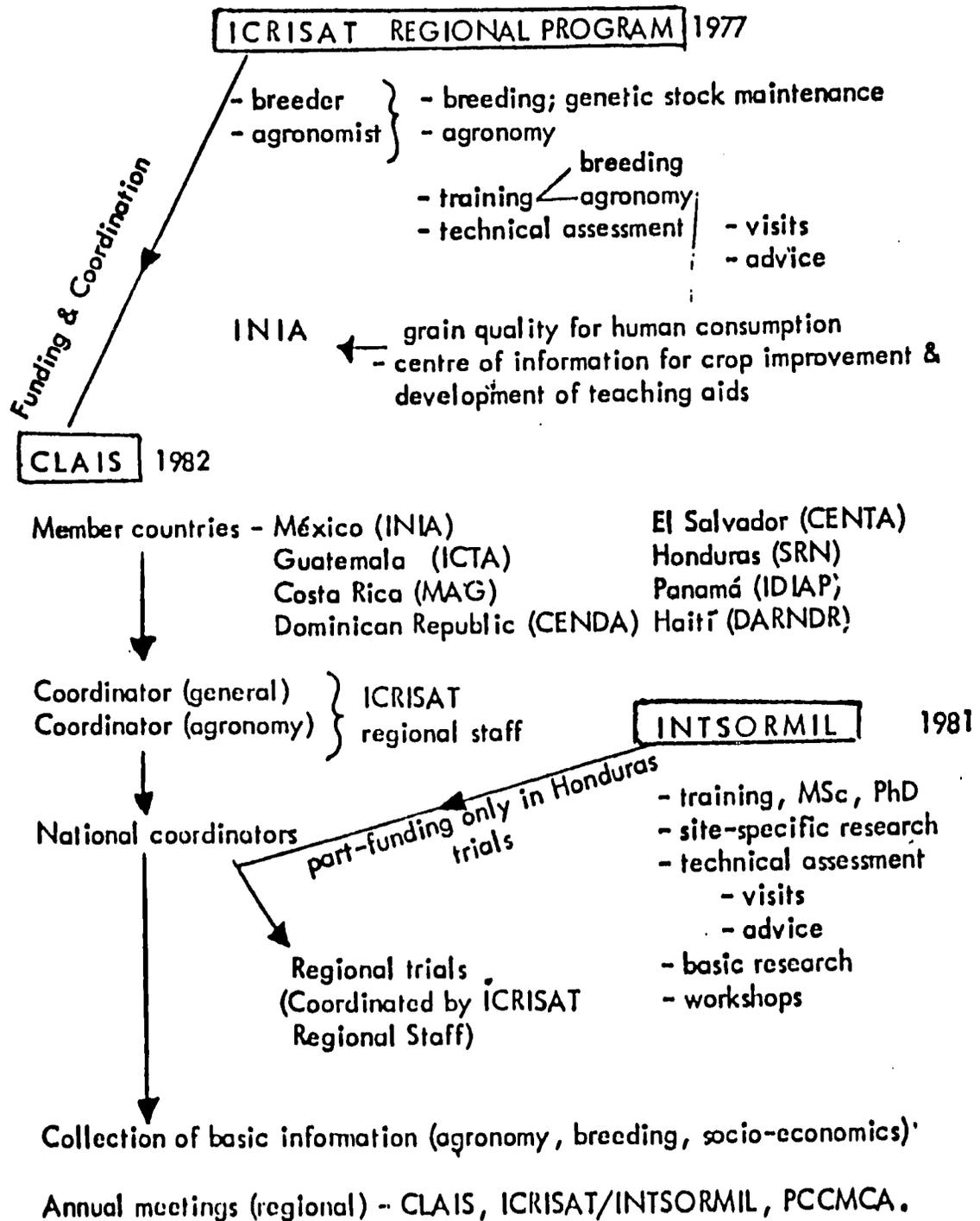
Observations and Recommendations

1. Considerable agricultural research infrastructure in Mexico with over 1000 scientists plus those with international organizations and private companies.
2. INIA and PRONASE are the two official Mexican government entities which deal with sorghum research.
3. ICRISAT since 1977 active in Mexico on sorghum.
4. Collaboration seems real and meaningful and includes training of Mexican students in the U.S.
5. Money and effort from INTSORMIL in workshop seem as a distinct contribution.
6. Socioeconomic and farming systems research by DeWalt et.al. is unique contribution.
7. INTSORMIL generally not well known in Mexico, some have erroneous conception of its purpose and intent.
8. Some concern over availability of food, health status and jobs as sorghum increases as a major commercial "feed grain".

9. ICRISAT expressed satisfaction with the collaborative efforts of INTSORMIL.
10. More actual research could be done in Mexico with funds transferred directly there but is this best plan for these limited funds?

REGIONAL FACILITIES FOR SORGHUM RESEARCH

(ACTUALLY IN EXISTENCE)



Sudan Trip Report

Date: November 4-7, 1984

EEP Participants: Brhane Gebrekidan
Nancie Gonzalez

INTSORMIL Participants: Allen Kirleis
Darrell Rosenow
Gebisa Ejeta
Tareke Berhe
Milton Coughenour

Itinerary: Nov. 4 - Khartoum

Nov. 5 - USAID, Eric Witt, WSARP, Defalla, Hagan, Riley, FRC, Shambat with Badi and Monawar

Nov. 6 - El Obeid with WSARP and Kordofan Regional Ministry of Agriculture

Nov. 7 - Field visits at El Obeid and Kazgeil and return to Khartoum

Nov. 8 - Wad Medani with ARC - Bakheit

Nov. 9 - ARC experiments

Nov. 10 - Khartoum (Shambat) FRC and Striga research concluding discussions with Kirleis, Rosenow, Gebisa

Nov. 11 - U. of Khartoum - Food Research Center - Report writing

Observations and Recommendations

1. ARC is only concerned with research but both WSARP and FRC do some training - extension work.
2. Some concern over coordination between ARC and the agencies of FRC and WSARP.
3. Extension service operates under Ministry of Agriculture but is grossly inadequate plus hindered by lack of transportation. Should be examined for possible improvement.
4. In spite of early delays considerable INTSORMIL research has been done and PI's have good rapport.
5. Sociological work in Kazgeil and other villages has been intensive.
6. Farming systems as a concept is well understood at the WSARP.

7. USAID and almost everyone else spoke with great enthusiasm about the new hybrid (Hageen Dura 1) but may not be so enthused for the anthropological and sociological work.
8. The Gezira scheme has about 2000 ha. under Hageen Dura 1 in 1984 but plan for 50,000 ha. in 1985; a really significant increase but this then requires a strong back-up program of breeding.
9. Should do more evaluation work under rainfed conditions.
10. Contribution of both Sudanese and U.S. scientists to the hybrid collaboration is excellent with Sudanese collaborator to visit counterparts in U.S., and this should be supported.
11. Physiology research well planned but equipment not being used suggesting need for more collaboration. Suggest Eastin visit at appropriate stage of crop development.
12. Pathological problems include charcoal rot, anthracnose, and long smut.
13. Dr. Hilu should monitor long smut situation closely so that emerging hybrid production program not at risk.
14. Need to have collaboration between pathologists and breeders.
15. Sudan is most severely Striga affected country in Africa but research input very limited.
16. INTSORMIL must encourage and catalize unexplored approaches to Striga research.
17. Strong and functional national team on Striga research will benefit not only Sudan but also Africa in general.
18. Food quality project evaluates promising sorghum varieties and hybrids for traditional foods, particularly Kisra. Hageen Dura 1 makes darker flour than testa-less white seeded varieties such as Dabar.
19. Equipment for quality lab not yet available.
20. New sorghum hybrid is being tried widely by Tareke Berhe in western Sudan but drought severe so data will be limited.
21. The INTSORMIL/WSARP collaborative program is the focal point of the new agricultural development initiative in north Kordofan. Linkages between INTSORMIL, WSARP, ICRISAT, and Kordofan Regional Ministry of Agriculture are excellent.
22. Director General of ARC will soon appoint an overall team leader for ARC/INTSORMIL projects.
23. Recommend that Sudanese collaborating scientists must take an equally active role in relevant project area identification in the future.

24. Suggest a joint workshop in the Sudan for all participating INTSORMIL and ARC scientists.
25. Need regular exchange of scientists and in both directions including training in universities of Sudanese.
26. Much more effort is needed to initiate more research projects on millet.
27. Consider involving faculty of agriculture of the U. of Khartoum and not just ARC.
28. More emphasis needs to be given rainfed sorghum.
29. Many of the INTSORMIL projects initiated in the Sudan have regional significance in eastern Africa.

Honduras Trip Report

Date: December 3-7, 1984

EEP Participants: Nancie Gonzalez
Ricardo Bressani

INTSORMIL Participants: Glen Vollmar
Darrell Rosenow
Billie DeWalt
Dan Meckenstock
Michel Jeger
George Wall

Itinerary: Dec. 3 - Tegucigalpa
Honduran Institute of Anthropology and History

Dec. 4 - Tegucigalpa

A.M. Recursos Naturales for discussion on INTSORMIL objectives, national seed production, agronomic and breeding activities, sorghum pathology, and government participation

P.M. "Las Playitas" Experiment Station at Comayagua - Meckenstock research

Dec. 5 - Choluteca - "La Lujosa" Experiment Station

Dec. 6 - Choluteca - home visit, State Fair

Dec. 7 - Tegucigalpa - USAID offices with Wingert and Warren

Objectives and Recommendations:

1. Agurcia and Cruz of Institute of Anthropology and History indicated INTSORMIL program in Honduras was already providing useful results including availability of improved seed, more efficient disease control, improved cooking qualities, and literature.
2. If a lack of collaboration, it was due to lack of appropriate human resources which are economically difficult to train.
3. Should consider possibility of creating at Recursos Naturales a socioeconomic group, by training local human resources.
4. Need grain storage studies and effect on quality
5. Nutrient content of hybrids on varieties should be established before commercial release.

6. Use besides tortilla and atole preparation from sorghum should be developed and done by other regional institutions.
7. Need more evidence of National Scientist participation and collaboration in planning and handling of activities.
8. Recommend pathological studies be continued.
9. INTSORMIL should provide National Scientist with increased library facilities.
10. Requested by National Scientists that INTSORMIL provide germplasm conservation facilities.
11. Consider sorghum vs poultry feed with animal products an intermediate step in food chain in Honduras.
12. Need to evaluate stover component of sorghum as taller types leave considerable available for further utilization.
13. Threshing equipment on farm should be upgraded to avoid waste.
14. Dedication of Meckenstock, Wall, and capacity of Nolasco (Head, National Sorghum Project) impressive.
15. Country shows strong interest in improving native sorghum varieties for both food and feed purposes but only Nolasco of National program seemed to have major program.
16. Good rapport between Honduras and Americans but real shortage of trained scientists for better collaboration.

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1984 EXECUTIVE SUMMARY
AID/W MANAGEMENT
REVIEW REPORT

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PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-447

1. PROJECT TITLE CRSP-Sorghum Millet		2. PROJECT NUMBER 931-1254	3. MISSION/AID/W OFFICE S&T/AGR/AP
DRAFT			
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)			
<input checked="" type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION			

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING		7. PERIOD COVERED BY EVALUATION	
A. First PRO-AG or Equivalent FY <u>79</u>	B. Final Obligation Expected FY <u>(cont.)</u>	C. Final Input Delivery FY <u>(cont.)</u>	A. Total	\$ <u>19.7 mil.</u>	From (month/yr.)	<u>February, 1982</u>
			B. U.S.	\$ <u>14.5 mil.</u>	To (month/yr.)	<u>January, 1984</u>
					Date of Evaluation Review	<u>January 3-20, 1984</u>

F. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
a. Reevaluate and prioritize constraints to sorghum/millet production, processing, marketing and consumption.	ME, TC, BD, EEP	6/84
b. Select principal countries for a fully intergrated interdisciplinary program for sorghum and millet production, processing, and marketing. Geographic and ecological regions should be considered.	ME, TC, EEP	7/84
c. Develop global plan	ME, S&T/AGR, TC	9/84
d. Select secondary countries to form regional networks of cooperation. Also include international and regional agricultural research centers.	ME, TC, EEP	8/84
e. Reconstitute External Evaluation Panel with emphasis on broad experience, both domestic and international, availability and commitment. Provide for ad hoc peer review committee by discipline. Establish criteria and scope of work for EEP, TC, discipline and country coordinators.	ME, TC, BD	4/84
f. Complete annual report including years 2, 3 and 4. Make plans for a 5 year summary as Year 5 Annual report	ME	4/84
g. Evaluate CRSP internal communication process for improvement between ME and sub-grant institutions, between institutions and with EEP.	ME, EEP	5/84

8. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS			10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT	
<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify)	A. <input type="checkbox"/> Continue Project Without Change	
<input type="checkbox"/> Financial Plan	<input checked="" type="checkbox"/> PIO/T		B. <input type="checkbox"/> Change Project Design and/or	
<input checked="" type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify)	C. <input checked="" type="checkbox"/> Change Implementation Plan	
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P		D. <input type="checkbox"/> Discontinue Project	

9. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)		12. Mission/AID/W Office Director Approval	
S&T/AGR/AP, R. I. Jackson	Date: _____	Signature	
S&T/AGR/AP, J. H. Yohe	Date: _____	Typed Name	
S&T/AGR, J. Royer	Date: _____	Anson R. Bertrand, Dir. S&T/AGR	
S&T/PO, G. Eaton	Date: _____	Date	

PES PART II

13. Summary: The Sorghum/Millet CRSP (CRSP-S/M) grant was approved July 1, 1979 for five years with an A.I.D. contribution of \$14.5 million. An additional \$4.7 million has been contributed by the participating institution for a total of \$19.2 million. The last evaluation, technical in emphasis was conducted February 1 and 2, 1982. This evaluation of an administrative nature will cover up to February 1, 1984. For activities prior to February 2, 1982, please refer to prior evaluations.

Eight U.S. universities are currently affiliated with CRSP-S/M, one is in an unfunded status pending submission and approval of a research project. Fourteen countries and four international centers (IARCs) have one level or another of collaborative activities ongoing with the CRSP. Only two, CIAT, and Honduras, have had the service of a long-term advisor. Botswana will have two agronomists and Tanzania one breeder in early 1984. Sudan and Egypt are possible countries where long-term staff can be located.

In-depth socio-economic studies have been conducted in Honduras, Upper Volta and the Sudan. These will guide biological research and act as a base line for measuring the impact of CRSP activities in future technical evaluations. Similar studies are underway in Mexico and will be conducted in other countries before any major biological research is instigated.

Research on improved breeding material, agronomic practices, insect and disease control, seed quality, food quality, control of storage pests and stress characteristics has been carried on extensively in the U.S. institutions and to a limited extent overseas, where scientists and facilities were available.

The research and CRSP organization in the U.S. has progressed according to design. With the development of higher yielding more resistant breeding lines, and the implementation of an ongoing participant and informal training program, good progress is being made toward goal and purpose achievement.

Problems have occurred with reporting (no recent annual reports) and planning for overseas activity (no global plan). As a result of no global plan overseas contacts and projects have been developed as opportunities appeared. Consequently, a large number of diverse projects have been initiated in fourteen countries. Geographic or ecological regions have not been considered nor has a fully coordinated program evolved in any one country. The Review Team's recommendation is for a coordinated global plan, interdisciplinary in nature, that will develop sites representing various geographic and ecological regions.

Evaluations have also presented difficulties as the major decision action on projects fell to the Technical Committee (TC). The External Evaluation Panel (EEP) was not sufficiently involved with the program to satisfactorily fulfill their responsibilities. A reconstitution of the EEP with a specific scope of work for each evaluation has been recommended to resolve this issue.

14. Evaluation Methodology: This was an A.I.D. sponsored management review by a team of three consultants, a BIFAD representative and the A.I.D. Program Manager as a resource person. The outline of the scope of work is repeated as the format for the team report.

The team was provided with project documentation, previous evaluation reports current trip, and other pertinent project budget and progress reports. The annual principal investigators (PI's) meetings were attended and projects and country reports reviewed. Principal CRSP staff of three universities, Arizona, Purdue and Kentucky were interviewed on a standard format at the PI's meetings. The university campuses of Mississippi State, Kansas State, Texas A&M and Nebraska were visited, facilities toured, and principal staff interviewed again using a standard format. At the University of Nebraska the Management Entity (ME) staff as well as project research staff were interviewed. Meetings were also held with department heads, research directors, comptrollers and deans at each institution.

The meeting and report reviews gave the team a broad, detailed understanding of the workings and administration of the CRSP. Team meetings were held subsequent to each institution meeting to analyze and reach decisions on each presentation.

Cost of the review was \$19,000

Team members included:

Dr. Elvin F. Frolik, Leader and Consultant

Mr. Keith Byergo, Consultant

Dr. Harve J. Carlson, Consultant

Dr. W. Fred Johnson, BIFAD, International Research Programs Officer

Dr. Robert I. Jackson, S&T/AGR Program Manager and Resource person

15. External Factors: The signing of Memoranda of Understandings (MOUs) with host country governments presented problems. Site emphasis had to be changed in the case of India and Egypt due to this difficulty and the start of other programs have been delayed. A suitable MOU format needs to be developed for the CRSPs to ease this problem.

The basic assumption remains valid. The overseas site selection criteria needs to be followed better to assure a satisfactory project location.

The phasing in of the four preceding sorghum/millet projects, by the fact of their previous existence, have had considerable influence on the character of work done under the CRSP. Old relationships and activities were difficult to change thereby influencing the locale and scope of research under the CRSP.

16. Inputs: Inputs have been provided at a level commensurate with project activity. These have consisted primarily of technical assistance, formal and informal training with a small amount of supplies and equipment for research both in the U.S. and overseas. This will likely increase as more of the research is done in collaborating institutions in the LDCs.

17. Outputs: The development of improved breeding lines has shown excellent progress. There is a regular exchange of breeding materials on an international basis. Commercial cultivars in Mexico, Honduras and the Sudan are benefiting from the infusion of new germ plasm as are varieties in the U.S.

The training of personnel to fill research center positions in the LDCs has progressed very well. The establishment of self-sustaining institutions to do sorghum and millet research has not been accomplished. Good liaison has been established between U.S. and LDC scientists due to technical visits, breeding nursery exchanges, participant training, workshops and seminars.

INTSORMIL in 1983 has 167 graduate students working on various projects. About half were supported by INTSORMIL funds. The LDCs and MICs accounted for 93 students, 71 were from the U.S. and three from other industrial countries. Eight workshops have been held with an attendance of 530 participants. Seven study tours were set up and used by 17 LDC staff members. Three additional workshops are scheduled for 1984. This rather extensive training program is developing a cadre of sorghum and millet research scientists in key LDCs. However, it will require more long-term U.S. scientist activity in the LDCs to accomplish the institution building goals of the CRSP program.

The socio-economic studies in Honduras, the Sudan, Upper Volta and Mexico are underway and have been of considerable help in guiding crop research. An example is the information on the wide use of sorghum for food in parts of Central America. Also these studies will provide the base line data for determining the impact of the program on the surveyed areas.

The network of 14 countries and four IARCs that exchange germ plasm and technical knowledge on a regular basis is a major accomplishment and will be a major factor in extending the technology to the farmer level. Needed now is the infrastructure for adaptive research and extension activity to be used by this network of scientists to take their technology to the farmer.

Management comments are covered in No. 22 below.

18. Purpose: The purpose of this CRSP is to: a. Organize and mobilize financial and human resources necessary for mounting a major, multi-institutional U.S.-LDC collaborative effort which in turn is expected to provide the knowledge base necessary to achieve significant advances in alleviating the principal constraints to improved production, marketing, and utilization of grain sorghum and pearl millet in LDCs and b. improve the capabilities of appropriate LDC institutions to generate, adopt and apply improved knowledge on grain sorghum and pearl millet to local conditions.

The CRSP has made excellent progress in mobilizing resources for U.S.-LDC collaborative research. A considerable body of knowledge has been generated on plant breeding, pest control, stress related problems and socio-anthropological constraints. Work is underway on marketing and utilization and an extensive LDC staff training program is ongoing. The problem remaining is the development in the LDCs of self-sustaining research institutions which in turn can motivate the necessary extension activity to gain farmer adoption of the new technology.

The implementation of the organizational and evaluation recommendation in No. 22 should impact strongly on this problem.

19. Goal: The major goal of this CRSP is to increase production of grain sorghum/pearl millet in those countries where they are the principal crops. This is to be achieved by:

Sub-Goals

- Developing and testing new and improved technologies, and;
- Teaching local scientists to solve problems related to sorghum/millet production and use.

Progress has been made in the two sub-goals but this has not translated into increased production due to lack of adaption by many farmers. While the CRSP does not have the responsibility for gaining farmer adoption it must provide the training and motivation for research staff to work with their local extension divisions and assist in providing technology to farmers.

Plant breeding programs with the appropriate technology are now underway in a number of countries that will provide adapted varieties with increased yield potential necessary to increase farm production.

Progress to date is totally satisfactory and is a direct result of the mobilization of staff and resource and the development of breeding lines suitable for various LDC conditions by the CRSP-S/M staff.

20. Beneficiaries: The ultimate CRSP beneficiaries are producers and consumers of grain sorghum and pearl millet in the LDCs. Producers are expected to benefit through improved production methodologies which reduce the possibilities of crop failure, increasing crop yield and decreasing the per unit costs of production which should result in increased income and improved standard of living for producers. Consumers are expected to benefit through:

- More reliable supplies of these food grains at stable prices in the market place, and;
- Availability of food grains that are more nutritious and with desirable taste, color and digestibility characteristics.

The beneficiaries to date have been LDC staff who have received either long or short-term training or experience with counterparts. There has also been some improvement of facilities and equipment for research. The trained staff are already improving research quality in their respective positions. This will increase as more long-term participants return to their LDC posts.

The limited introduction of new varieties and the accompanying cultural practices give every indication that where adapted these new inputs will be readily accepted. Another caveat is that LDC governments must provide reasonable incentives in the form of farm gate prices if they expect to have farmers make the additional efforts and assume additional costs to increase production.

21. Unplanned Effects: None pertinent at this time.

22. Lessons Learned: While the flexibility allowed by a loosely structured program initially allowed a wide proliferation of activity, without a global plan to coordinate activity the result was a collection of subprojects and not a concise cohesive program. The Review Committee recommended the development of a global plan as called for in the grant agreement. This would follow a reassessment and prioritization of major constraints to increase sorghum and millet production. Prime countries would be selected as geographical and ecological centers of excellence that would have the staff and resources to potentially be a leader in sorghum and millet technology in its area. A network of countries of similar ecology would be organized to work closely with the prime country and CRSP researchers in adaptive research and develop a production, processing and marketing system for the area.

It would be expected that a total program would be developed at the prime site with technology and training being distributed out from the point.

Improved communication in and between CRSP entities both in the U.S. and overseas would be very beneficial in the distribution of reports bulletins and other CRSP material.

Lack of involvement of the EEP resulted in CRSP evaluation problems. The EEP was not kept well enough informed or closely enough involved with the various CRSP projects to provide an indepth realistic review. Reconstituting and broadening the scope of the EEP and allowing for the formation of ad hoc peer review committees for various disciplines would resolve the problems that arose when the major review responsibility was given to the Technical Committee (TC) and Board of Directors. Major changes of subprojects should be as a result of EEP review in which the TC and Board concurred.

In regards to the establishment of country programs, it should be the responsibility of the Management Entity (ME) to negotiate and finalize the Memorandum of Understanding (MOU). Scientific staff may be involved in the development of scopes of work but the ME representative is the only one qualified and knowledgeable about the lead institution's policies to conduct discussions and sign the MOU.

23. Special Comments: a. AID/W Administrative Review Report.

S&T/AGR/AP:KByergo:lsl:2/21/84: ext 235-2318 (WD 0834f)

1982 EEP REPORT

INTSORMIL
EXTERNAL EVALUATION PANEL REVIEW
Kansas City, Missouri
February 1-5, 1982

Report of the Second INTSORMIL Review

Acknowledgements

1) We are grateful to the Board of Directors, to the Director of INTSORMIL, and to the Technical Committee for their strong interest, co-operation and assistance, both in the preparation for this review, and during the review itself. We noted with appreciation the way in which the members of the Board, as well as the Director, Dr. Earl Leng, attended all the sessions, taking an active interest in the daily proceedings, and discussing the programs and many of the issues raised.

2) We are grateful to the scientists who outlined their work to us for the high standard of their concise presentations, and for all the time put in on preparation. Their efforts were of great value to our panel.

A. General

3) Five members of the panel were present for this review. Dr. Uma Lele was unable to attend, so Dr. Ralph Cummings, Jr. kindly agreed to act as the sixth panel member. The presence of Dr. Ricardo Bressani added another voice from the developing world to that of Dr. Brhane Gebrekidan, and his eminence in the field of nutrition and food science ensured a better assessment of those aspects of the program than was possible at the earlier review. Similarly, Dr. Cummings' contribution to the socio-economic area was invaluable.

4) We were glad that the sorghum program leaders, Dr. Leland R. House, and the millet program leader, Dr. David Andrews were able to attend from ICRISAT. We found their presence essential, and would urge that one or two senior professional staff from ICRISAT should always be present at these review meetings. The possibility of inviting the ICRISAT sorghum and millet physiologists to the next meeting should be considered. They might be encouraged to spend a few days in professional discussions with the university plant physiologists involved in projects under this CRSP. We recommend that the Director be empowered to invite sorghum/millet workers not presently being supported from INTSORMIL funds to attend these meetings. Dr. Bob Jackson of USAID and Dr. W. Fred Johnson, representing BIFAD, participated in all the meetings. Their constructive contributions are acknowledged with appreciation.

5) The Director of INTSORMIL and the Technical Committee may wish to consider possible alternative ways of conducting these reviews. Now that the CRSP is operational we believe that a more informal sharing and exchange of ideas and experiences would be of greater value. We are required to review the whole operation of the CRSP, but it may be better to go more deeply into some particular aspects of the work at each review, rather than trying to deal with the whole program in depth on every occasion.

6) The Board may also wish to consider the interval of time which should elapse

between reviews. Annual meetings may well be too frequent now that such an excellent start has been made.

7) At the time of this review, the CRSP had been operational for 25 months. We are most favorably impressed by the progress made since the earlier review 16 months ago. We are delighted by the speed and imaginative ways in which the overseas linkages have been created. We appreciate the way in which the suggestions made in our last report have been examined and acted upon. An excellent beginning has been made.

8) We believe that this CRSP is already making a valuable and distinctive contribution towards meeting the needs of the developing world. Its primary purpose of making available to the agricultural scientists of the developing world the knowledge, skills, and personal concern of the scientists of the U.S. Universities is being achieved effectively. We particularly welcome the constant thought being given to finding new and better ways of achieving this end. The flexibility under this CRSP allows each University group to make effective arrangements to meet the needs of the individual countries and organizations where assistance is being given.

Overseas Linkages

9) Overseas linkages were considered in paragraphs 21, 22 and 23 of our last report, to which reference should be made.

10) The current situation of development of international linkages includes the following countries:

<u>COUNTRY</u>	<u># OF PROJECTS</u>	<u>COUNTRY</u>	<u># OF PROJECTS</u>
Botswana	1	Mali	2
Colombia	2	Mexico	2
Egypt	2	Niger & Upper Volta	2
Honduras	5	Philippines	1
ICRISAT	2	Sudan	3
India	1	Tanzania	1
IRRI	1		

11) There are many other linkages through student training and visits by INTSORMIL scientists, who spent 1,813 days visiting LDC's, or approximately seven scientists years in the past year.

FINANCIAL

Project fund allocations of AID support for the 1981-82 year 3 and for 1982-83 years 4 are as follows:

<u>INSTITUTION</u>	<u>NUMBER OF PROJECTS</u>	<u>AID CONTRIBUTION</u>	
		<u>Year 3(000)</u>	<u>Year 4(000)</u>
Arizona	1	70	75
Florida A&M	1	29	--
Kansas State	6	366	415
Kentucky*	2	200	120
Mississippi State	3	255	300
Nebraska	9	410	495
Purdue	5	435	435
Texas A&M**	7	745	805
Management Entity: Headquarters		200	300
Technical Assistance		40	100
LDC's		<u>100</u>	<u>355</u>
	TOTAL	2,850	3,400

* includes a Sudan and a Honduras project

** includes Honduras project

Continuity of funding is essential for this CRSP to function at a high level of expertise and was to be assured by this grant being extended annually to maintain a five-year advanced program plan.

For Year 4, INTSORMIL has presently \$1,858 million and expects to receive on May 1 or earlier \$1,642 million. This will give the full \$3.5 million for year 4 (July 1, 1982-June 30, 1983). Expected expenditure as above is 3.4 million.

The INTSORMIL grant calls for \$3.5 million more for year 5. AID now proposes to give only \$3.1 million, whereas projects expect to spend \$3.6 million.

For year 6, there is need for \$4.25 million AID money but here again, AID proposes only \$3.1 million. For year 7, \$4.79 million is needed.

This significant reduction for years five and six can only reduce the effectiveness of a rapidly expanding international component of sorghum and millet improvement for the LDC's. The review committee strongly urges AID support of the amounts suggested above of \$3.6 million for year 5 and \$4.25 million for year 6 which in fact represents no increase over year four assuming 10% inflation.

Continuity of funding is absolutely essential. The director has committed funds to place and maintain certain staff members overseas, to ensure that the maximum amount of work is done in the developing world, as required under the legislation establishing the CRSP. This involves firm financial long-term commitments, and the maximum possible proportion of the budget has been committed in

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this way. Any failure to fulfill the complete funding obligations already entered into by AID would do serious damage to the program and such injury could be permanent. The resultant uncertainty and sense of insecurity in the minds of those staff posted overseas would lead to unwillingness on the part of other high caliber staff to enter into commitments for overseas service.

THE INTSORMIL ESTABLISHMENT

ORGANIZATION:

We consider that the organization established by the Director is working well. The headquarters cell staff has been kept to the minimum. We welcome the appointment of a part-time Assistant Director to help the Director with his substantial work load. We note that the Assistant Director will be especially involved with the operations in Botswana. We consider that this appointment was essential. The Technical Committee system has proved to be very successful in operation.

PARTICIPATING UNIVERSITIES:

The Director has informed us that there are no advantages either administratively or costwise to be gained from reducing the number of participating universities. The skills and expertise in sorghum and millet available in the U.S.A. are distributed over many universities. We believe that all willing and able to participate effectively should be encouraged to do so, as circumstances permit. A much wider pool of skills is then available than could be the case were the CRSP operations to be confined to two or three universities. We welcome the intention to include the University of Georgia under this CRSP, and believe that any reduction in the number of universities for reasons of administrative tidiness alone would deny the services to this CRSP of many talented people.

LATIN AMERICAN PROGRAMS:

We noted with approval the steps taken to develop INTSORMIL activities in Latin America:

Mexico/CIMMYT:

Recognition is given to the successful disease workshop recently held in Mexico for extension-type participants from Mexico and Central American countries. Also cooperative research with Dr. Vartan Guiragossian with ICRISAT at CIMMYT, where research having implication for Latin America is encouraged. Because of the impact of the commercial seed business in Mexico represented by every major U.S. sorghum company we would discourage INTSORMIL sorghum breeding activities at country level. The opportunity for Mexico to be self-sufficient in coarse grain production will most likely occur by a strong commercial seed industry encouraged and supported by the Mexican government. At present, more than 90% of the sorghum acreage is hybrid and 95% of the hybrid seed is provided by private industry. Any agreement with the government of Mexico must make hybrid seed produced under the INTSORMIL program freely available to all, especially to the private seed companies.

Honduras:

Developments in Honduras are most satisfactory. Several projects are operation, and an agronomist from Texas who is fluent in Spanish has been stationed

there, to oversee all the GS/PM activities under the CRSP. We are sure that the research results and improved crop hybrids and varieties being developed in these two countries will spread into Latin America from this bridgehead. This largely circumvents the political problems which so hinder attempts to get improved varieties and practices to needy small farmers in that region.

Other areas:

In our last report we urged that special attention should be given to Latin America, because the pest and disease situation is similar to that in the U.S.A. The region to the north of the Equator, and much germplasm and expertise is thus immediately applicable. We consider that our suggestion has been well adopted, and we would not press for additional efforts to the south.

We fully approve of the steps which have been taken in the much more difficult task of getting effective work going in Africa. Reference has already been made in paragraph 10 above to these activities. We wish the staff of the universities operating under this CRSP God's help in their endeavors.

We trust that ways will be found to surmount the obstacles restricting activities in India.

STRIGA (WITCHWEED):

During the sessions, our attention was drawn to the very serious damage caused by this parasitic weed over extensive areas of Africa, also in India. We know this to be the major problem for the small GS/PM grower in Africa, requiring sustained research by a team of scientists embracing the disciplines of plant breeding, agronomy, plant pathology and plant physiology/biochemistry. The unique skills available in the U.S. Universities could make a big contribution towards solving this serious problem, but the cost would be far beyond the resources of this CRSP. We would therefore urge the Board and the Director to seek ways of cooperating with other USAID schemes, with ICRISAT, and perhaps also with other donor agencies, in order to mount the sustained research effort required to control this parasitic plant. Thousands of acres go out of cultivation every year solely due to the presence of this damaging parasite which persists for decades, once it has encroached on the land.

INTERNATIONAL CENTERS:

We are encouraged to find how much interaction has developed with international centers, especially with ICRISAT. We would urge increased cooperation, and joint planning sessions occasionally, so that the maximum of complementary activity may be attained, without duplication of effort.

SOCIO-ECONOMIC STUDIES

The panel notes with pleasure that intentions to develop a socio-economic component expressed at the previous review are becoming a reality. This will result in a positive interactive contribution to the INTSORMIL program.

Social scientists can play several roles; these include baseline studies at the initial stage of project preparation; marketing studies to determine what must be done to promote economic incentives; production-economics studies; policy

studies; and broad analyses to project demand and supply. Socio-economic studies are often location-specific.

THE PROJECTS:

Project UK-2, Sudan: This project, to be completed in six to nine months, should provide useful information from which subsequent INTSORMIL initiatives should benefit. During the final stages of analysis of the socio-economic data, we encourage the biological scientists to familiarize themselves with the study, raising questions where necessary to ensure that they can make their subsequent programs more relevant. The review of research policy should likewise provide useful information to help understand the institutional environment within which the scientists must act. This appears to be a strong project.

Project UK-1, Honduras: An initial survey has been completed in this project. Staff are strong professionally, Spanish speaking, have previous knowledge of the area, and have developed interactions with INTSORMIL biological scientists and nutritionists working in Honduras. This promises to be a strong project.

Project MSU-3, Honduras: Initial analysis of data has been completed in a region very close to UK-1. We recommend that results which promise to be interesting be written up and reviewed by the Honduras committee.

Project PRF-1, West Africa: We recommend that a synthesis of available socio-economic information relating to agriculture in the Sahelian countries be prepared. Review of the information could provide a basis for INTSORMIL to determine whether it has adequate data on which to plan and implement programs. If not, specific studies might then be suggested for project funding. Cataloguing of the studies and publications collected thus far might provide a valuable information source of benefit in the Sahelian countries. Research on market development and price policy is of top priority. This project is to be directed by excellent professionals and carried out by graduate students who speak French or are otherwise knowledgeable on overseas conditions. This focus should be encouraged and hopefully extended to other geographic regions.

Project KSU-3, India: This project appears to be well conceived and will be carried out by a well-trained scientist who speaks the local language. However, the study stands alone due to problems in obtaining clearance for additional INTSORMIL activities in India. India has a strong group of social scientists and ICRISAT has an active village level survey program in the country. The results of the study are not likely to contribute significantly to general INTSORMIL objectives. We recommend that a time-table be established to permit collection of necessary data and that project financing be provided throughout the necessary period.

AGRONOMY

The committee feels that the projects so classified here have the opportunity to fill the void between scientific accomplishment in the LDC's and the farmer, better than any of the other categories.

Project UN-5: The value of this project as it related to Fe, Al, N, and P is significant with special implications for the acid "cerrado" type soils of South America where aluminum toxicity is severe. The screening methodology seems capable of replacing similar work such as that in MSU-2.

Project UN-6: Dr. Maranville plans to spend a year beginning in July, in the Philippines, working directly on mineral element efficiency improvement with emphasis on N uptake and use.

Project UN-4: This project under the leadership of Dr. Francis is already underway in Tanzania. The emphasis of genotype X environment interaction with regard to farming systems has special implication to experiment station development and/or improvement.

Project UN-11: Although presently not funded, we see productive contributions from cropping systems research with sorghum-legume rotations. Because of the location interaction it seems imperative that the research be done on location in the particular LDC('s), and if this condition is met we would recommend funding.

Project MSU-1: This project on seed factors influencing stand establishment problems duplicates the work of Peacock at ICRISAT in India, has no formal linkages, and may be too technical for practical application. We suggest that the project be re-oriented in collaboration with Peacock so as to avoid duplication, or be dropped.

Project KSU-6: This effort on Millet stand establishment is essential but is relevant (as stated in the review of sixteen months ago) only to the situation in the LDC's. We still would emphasize that most of the research should be done in the LDC's.

PLANT PHYSIOLOGY

Whereas the committee strongly appreciates the strength of this group as regards basic research, we must express concern as to its applicability to on-going research in the LDC's. Therefore, we encourage as much direction as possible to be given to short-term and direct application of both basic and applied projects.

Project UN-2: The objectives of this project emphasizing temperature, yield, and water stress interactions are significant in much of the world in relation to sorghum and millet production. We do encourage as much application as possible be made in the LDC's plus the continuation of drought screening work at Garden City. Concern exists as to the validity of the gradient system, as it might interact with additional soil moisture availability and climatic conditions. Therefore, we would encourage multiple evaluation such as Yuma and Garden City to better classify materials with a necessary third test being in the LDC's. Perhaps the corn comparisons, interesting as they may be, could be confined to non-INTSORMIL funding.

Project UN-1: This water relations project is sound but could use international linkages which will require less sophistication and an ability to handle much larger numbers. Considering the level of expertise and basic oriented research perhaps more of this with other international centers would be a first step as well as cooperative efforts with the breeding activities.

Project UN-3: This project on grain fill is completed.

Project UN-8: This climatology effort can hopefully involve even more overseas linkages than the Philippines, Tanzania, and Colombia. We see value as an extension tool to better relate growth cycles of sorghum and millet to periods of favorable rainfall. The breeder also needs this guidance in developing appropriate maturity genotypes. This project should be made to relate to the similar but more extensive work done at ICRISAT.

Project KSU-2: We are pleased to see millet being evaluated for canopy temperature and water use efficiency. Direct application as in UN-1 may need to go through international centers and in collaboration with breeders.

Project TAM-21: We place this project under physiology only as it related to the support Jordan can give the breeding project where drought resistance is evaluated under low elevation and relatively high humidity as opposed to Rosenow's efforts in a situation over 1000M altitude and in low humidity. The root, photosynthesis, and wax information coming from this portion of the program is generally both unique and worthwhile. We did not hear from Page Morgan.

Project AU-1: The Arizona team includes this physiology approach which involves both a screening service to the breeder as well as more basic studies on physiological traits of parents and hybrids. The uniqueness of the environment as well as the interaction with Voigt and Webster makes this a strong program for both U.S. training as well as international linkages, more of which should be encouraged.

PLANT BREEDING

Integration of drought, deficiency, and resistance work into the plant breeding activities is now much more complete, noticeably in the Texas programs. We consider this desirable at all centers.

Project UA-1: Work on drought resistance is extremely important for most of the LDC's growing sorghums and millets. This project should be encouraged to continue. However, it appears that more coordination is needed with the drought resistance breeding work at Texas, ICRISAT, and even the drought physiology work at Nebraska. Testing and evaluation of elite germplasm selected in this project at LDC sites where drought is a major problem should strengthen linkages with LDC's.

Project KSU-1: This is the only INTSORMIL project that is working on pearl millet breeding and as such it is important. The direct usefulness of germplasm developed at Kansas for most of the LDC's was questioned in the last review meeting. This question still remains. Developing a collaborative testing and evaluation site in an appropriate country in West Africa would strengthen this project. The germplasm expected to come out of this project should be useful for areas with short seasons. The work on heritability and gene action in pearl millet is not high priority for the immediate food production needs of the LDC's.

Project MSU-2A: This project appears to lack focus and is spread out too thinly to have significant impact in the LDC's. It is concerned with i.e., toxicity, sorghum midge, armyworm, grain mold, leaf disease etc. resistance breeding and also is concerned with inheritance of multiple sources of resistance. Since work on AI toxicity is being handled by several others in this CRSP, coordination and collaboration with the other projects in this effort appears necessary. In the other areas also, ICRISAT and other projects in this CRSP are involved a lot. It appears that more examination of these issues may help to narrow down and focus this project into areas of direct use to the LDC's. The work on armyworm may be of value to LDC's, and work on stem-borer at a location in an LDC in Africa would be of great value.

Project UN-7: Basic work on comparative sorghum breeding methodologies with emphasis on recurrent selection is very important. Therefore, this project should be encouraged to continue. However, the lack of sufficiency of a breeding method

for use in LDC's sites is of concern. Since the efficiency of a breeding method for use in LDC's should be viewing in terms of speeding the breeding progress, the inclusion of off-season work would appear useful. This may offer a good linkage opportunity for this project.

Project TAM-21: This is an excellent project and perhaps the best example of work most useful and applicable to the LDC's. The germplasm coming out of this project continues to be in high demand both in the LDC's and the U.S. The overseas linkages in this project and are generally good. Perhaps more vigorous effort in distributing lines and hybrids from this project to more LDC's may be useful.

Project TAM-22: The work on disease resistance breeding is properly oriented to the needs of the LDC's. The linkages with LDC's appear good. In the area of drought resistance breeding it appears necessary to have more coordination with ICRISAT, Arizona, and Nebraska, all of which are actively working on this extremely important problem of the LDC's in the SAT. Another area which needs close coordination with other projects is the work in A1 toxicity.

Project TAM-23: Work on insect resistance breeding is very important for the LDC's. This project continues to develop germplasm of use to many countries in the SAT. Since stem borers are extremely important in most parts of Africa, shift of emphasis to stem borer resistance breeding would be most useful. In the area of breeding for N and P efficiency, closer coordination with others working on this problem (particularly Nebraska) would appear useful.

UTILIZATION AND NUTRITION PROJECTS

Only one of the six projects in this section is on millet. One project deals mainly with project development and utilization, three involve biological evaluation for protein quality and digestibility, and the effects of anti-nutritional factors on utilization. Two of the projects are more concerned with consumption. The projects all have overseas linkages through direct control or through students.

More detail on home preparation methods for both cereals would be desirable. The effects of alkaline cooking (lime or ash) and of fermentation processes on chemical composition, functional properties, and nutritive value need study. The work on tannins is particularly welcome. The nutrients other than protein and calories should not be forgotten.

More nutritional quality evaluations are needed, especially on millet.

Project TAM-26: This is a good project, providing valuable information on utilization of sorghum as food, alone or in combination with other foods. The information is of value in developing countries and more efforts should be made to implement the various technologies developed. The research should be continued to elucidate problems related to processing functional and organoleptic quality. More work or similar work should be done on millet. The information should be made available to investigators in agronomy physiology and breeding, as well as to those concerned with socio-economic problems.

Project KSU-5: The objectives of this project are similar to others in this area and the research has been concerned mainly with millet. It was surprising to see studies on nutritive quality using guinea-pigs, animals not conventional for this type of work. Cholesterol is not a problem in the developing world. This was

the only project of the group with millet, so more conventional methodologies should be used to evaluate this grain.

Project PRF-3: This represents a project well carried out providing useful information on the nutritional problems in sorghum and the effects of processing on nutritive value. It is important to learn of the factors responsible for the low digestibility of protein and low energy availability.

Project PRF-4: Tannin content represents one of the main limiting factors in sorghum. Therefore, the work carried out under this project is very important, in utilization and in the effects on nutritive value.

Project MSU-3: The research done under this project is basic to projects on production and utilization. It was carried out well, obtaining useful information. More details are needed on preparation and consumption. Sorghum samples should have been obtained for evaluation. It was surprising that there was no mention of other groups of INTSORMIL also engaged in Honduras.

Project FAM-1: We felt that circumstances had hindered the operation of the project, since there was so little to report. We believe that the Director should inquire into the nature of these hindrances, and determine the prospects of this project being carried out effectively.

PLANT PATHOLOGY

Project TAM-24: This project continues to exhibit the model characteristics of an INTSORMIL project. Reviews of the two of the four sub-projects were presented, with an over view of the third one. Services to and consultations with developing countries, the development of educational information, the establishment of a network of international disease nurseries, the holding of conferences and workshops, training and education of a large number of students on campus and the development of a number of overseas linkages are significant achievements and areas of involvement. The development, storage and upcoming announcement newsletter of availability of antisera of eight sorghum viruses will be quite useful for easy, risk free identification. The development of multiple disease resistant, food cultivars in cooperation with breeding projects are applicable to developing nations. Collateral to this is the establishment of and transmission to LDC's of disease testing procedures. The panel recommends continued major support for TAM-24.

Project MSU-2b: The panel also recommends continued support for this project. Normal progress appears to have been made. The warm, humid condition of the location is similar to conditions in many of the developing countries. This is the only project dealing with sweet sorghums (sorgos) and nematode problems. The disease work with food grain types, study of grain molds and weathering, the development of several overseas linkages and the domestic trainees and education program for foreign students is noted with satisfaction.

Project PRF-2: This project has been totally revamped to emphasize now anthracnose of sorghum. The panel would agree that this project has merit provided strong cooperation is established with breeding projects, particularly PRF-3, in addition to the stated objectives, and overseas linkage can be established in addition to Egypt.

Project UN-10: This project is new and is primarily directed to sorghum virus diseases. Questions arise about its importance and relevance, since a strong, well established program (TAM-24) exists in Texas which has established overseas linkages and integration with other disciplines. We urge the INTSORMIL director to provide guidance to the leader of UN-10 to help establish a meaningful program which would include cooperation with breeding projects and collaboration with TAM-24.

ENTOMOLOGY

Project TAM-25: This project is the main field entomology project of INTSORMIL. Like TAM-24 is pathology, it is a model example of how a project should function and shares most of the characteristics of overseas linkages, training, conferences and workshops, consultancy services, supply of pertinent information and interdisciplinary research work. The panel is pleased with the established linkage with ICRISAT and would encourage continued close cooperation. Between the two centers, the important insect pests of the world can be dealt with in an orderly manner. The panel recommends continued support at about the same level be given to TAM-25.

Project MSU-2b: The panel has reservations about continued support at the present level to this project. The relative of various sorghum cultivars to midge infestation was reported (TAM-25) to be the same throughout the world. Therefore, project TAM-25 would appear to involve sufficient expenditure and effort for research on midge. Work with fall armyworm seems to be warranted under MSU-2b since moderate resistance to armyworm attack is reported in sorghum. The panel recommends that the midge work within MSU-2b be discontinued and that TAM-25 take full responsibility for midge.

Project KSU-4: This project is the only INTSORMIL project dealing with the storage and preservation of pearl millet grain. The subject is of importance to the LDC's. The panel recommends its continuance although perhaps at a lower level of funding since a great deal of the descriptive work has already been done. We would urge research with fumigants, as the practice is deployed on farmsteads in several developing countries. A more imaginative approach to the solution of the problems would be desirable.

SUMMARY OF PROJECT ASSESSMENTS

A majority of the projects were relevant and good. Some would benefit from better integration into the program.

Project KSU-1 does need a site in the developing world: and the heritability gene action studies do not seem relevant to the LDC's.

Project MSU-2 is wide-ranging: it should concentrate on a single problem.

Project FAM-1 has made but little progress.

Project MSU-1 needs to be redesigned to complement the ICRISAT work.

RECOMMENDATIONS

A system to allow for limited funding outside the present projects at participating or home participating universities which would be administered by the

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director would be helpful.

The review committee members need to be updated on any changes in funding, projects, staff involvement, etc...

Submitted by,

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10/5/7