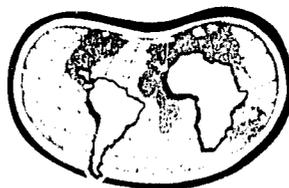


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**THE BEAN/COWPEA
COLLABORATIVE RESEARCH
SUPPORT PROGRAM (CRSP)**

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P

T H R E E Y E A R R E P O R T

S U M M A R Y

U S L E A D I N S T I T U T I O N S

Colorado State University
Cornell University
Michigan State University
University of California-Davis
University of California-Riverside
University of Georgia
University of Nebraska
University of Puerto Rico
University of Wisconsin
Washington State University

H O S T C O U N T R I E S

Botswana
Brazil
Cameroon
Dominican Republic
Ecuador
Guatemala
Honduras
Kenya
Malawi
Mexico
Nigeria
Senegal
Tanzania

In thoughtful discussions among the outstanding US and non-US professionals associated with this CRSP, various points of view have been shared in attempts to identify research strategies which will contribute to human well-being throughout the world. From the array of national, cultural, ethnic, gender, class and disciplinary perspectives, their interactions with one another have opened new horizons to the development and application of evolving science and technology. The researchers, most of whom had been wrestling with global issues independently long before coming together in the CRSP, have been stimulated by one another and have found excitement and power in the expanded peer relationships. The professional traffic of scholars among CRSP countries highlights the mutual benefits of such relationships and emphasizes a growing appreciation of the mutual dependency. As Professor Paul Streeten has pointed out "knowledge is a common good and its pursuit unites scholars across the world."¹ This intellectual dependency is a mirror image of the economic and environmental interdependence that exists among all countries including the US and the developing countries which are the Host Countries (HCs) of this CRSP. World hunger and malnutrition are undeniable and poignant examples which are experienced at some level in all countries.

According to the Washington, D.C. Environmental Fund, the US population is approximately 235,000,000 people. However, US land available to produce food for this growing mass is being lost at an average of over a million acres a year, mostly to urban sprawl. Presently, US agriculture, the most prolific in the world, produces an abundance of food for US consumption. The US also produces each year, millions of dollars worth of food for export.²

Some of this surplus food is sold on the international market and helps address the US balance of payments deficit. That deficit is recently reported to be over \$40 billion this year and expected to surpass \$80 billion by the end of 1985--a foreign debt level that dwarfs that of most developing countries.³ Other surplus food from the US enters the international arena as foreign assistance to poverty and famine ridden areas of the world. Such areas are often plagued by instability and political strife which threaten the existence of all nations. Basic commodity shortages frequently fan those flames, jeopardizing international efforts to address such global concerns as pollution, population growth, nuclear weapons and security. An additional complication is that developing countries represent the largest growth markets for the sale of US exports compared to US exports to developed countries. These same developing countries are also the countries from whom the US imports raw materials critical to commercial industries and defense.⁴

The importance of US food production to the US and the rest of the world presents a serious and complex dilemma. The Environmental Fund projects that if the population of the US continues to increase at the present rate and the land available for agriculture continues to decrease, by the year 2000 all the food produced by the US will need to be consumed within the US. A vanishing US export market capacity and depleted food assistance program could have dire implications. Further, no country can avoid being affected by such recent occurrences as the expanded use of chemical warfare, changing weather patterns worldwide and the large numbers of severely stressed national economies. All of these issues demonstrate that the US lacks immunity to the painful unemployment, mass poverty, hunger, drought, infestation and disease problems suffered by many countries of the world. In reality, the US too is a developing country. It, too, will benefit from a sharing of resources and the strengthening of national institutions with whom it can collaborate.

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Thus, for world humanitarian needs as well as for US survival requirements the US agricultural network, especially its Land-Grant community, must play an even more prominent role in the international arena than it has in the past. HC and US students entering this arena, for which most contemporary professionals were never prepared, require from their educational institutions greater international participation. HC and US faculty, who must face those young men and women in classrooms and supervise their research in laboratories and in the field, require increased international professional experience and continuing education. For US and HC participants CRSPs can provide an example of human resource development based on shared scientific, technical and socio-cultural understanding.

The promise of US Title XII and HC institutions is heightened by their joining together the best of HC and US scientific and traditional agriculture and the related disciplines. Through their heterogeneous resources, their composite experience and their vast research capacity, such collaboration is a natural extension of the Land-Grant tradition. The new findings emerging from the array of Bean/Cowpea CRSP projects only hint at the long-term potential: US and HC cowpea germ plasm crosses in Africa outperformed other exotic and traditional lines during the recent severe drought there; basic research contributes to scientific understanding of genetic, agronomic and socio-cultural factors important in the maintenance of rich natural germ plasm pools--a constantly changing trust especially important for those who rely on beans and cowpeas as food; monoclonal antibody procedures developed for quick, simple and inexpensive detection of seed borne viruses in beans; native fungal isolates showing promise in biological insect control which can minimize use of expensive and often toxic synthetic insecticides; village level technology for increasing among rural and urban populations the availability of inexpensive cowpea meal acceptable in the preparation of traditional foods.

Through such research efforts new mutually rewarding relationships are being fashioned with sensitivity and care. Over the long term they will provide the foundation for strengthening communication, respect and trust among future agricultural leaders. To the extent that the CRSPs function well and are truly collaborative research and training programs, they will leave behind a major human and scientific legacy. If we are lucky, they will also make a noticeable impact on world poverty, malnutrition and hunger.

Pat Barnes-McConnell
Program Director
Michigan State University

- ¹ Paul P. Streeten. Social Science Research on Development: Some Problems in the Use and Transfer of an Intellectual Technology. The Agricultural Development Council, Inc., July, 1975.
- ² Bradford Morse. "Where 80% of UN Resources Go." Christian Science Monitor, April 19, 1983.
- ³ Alan Murray. "Payments Gap Rose in Fourth Period to \$15.29 Billion." Wall Street Journal, March 20, 1984.
- ⁴ Edmund S. Muskie. "The West's Stake in Third-World Aid." Christian Science Monitor, August 6, 1980.

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BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM (CRSP)

The Bean/Cowpea CRSP is a vigorous international research partnership that directly involves US and Host Country (HC) scientists in research and training to increase the availability of beans and cowpeas in food-deficient nations. It unites the scientific resources of the identified countries to address universal constraints to bean/cowpea production and consumption through research in settings where there are unique local advantages and resources.

PROJECT ORGANIZATION

The research of the CRSP is organized in sets of HC and US teams collaborating in addressing one or more constraints to bean or cowpea production and utilization. No projects are freestanding in the US without HC alliances. All evolved from the two-year planning effort.

Total projects:	18	Africa: 8	Latin America: 10
Total Host Countries:	13	Africa: 7	Latin America: 6
Total bean projects:	12	Africa: 3	Latin America: 9
Total cowpea projects:	6	Africa: 5	Latin America: 1
US lead institutions:	9		
Total US institutions contributing resource scientists: 14			
Cooperating International Research Centers: 2			

PROJECT PERSONNEL

Notwithstanding coups or serious coup attempts in five of the CRSP HCs, food riots and other forms of political unrest, the projects continue their steady forward progress. This noteworthy achievement is undoubtedly the product of convivial professional relationships formed among the heterogeneous group of competent people whose human natures seem to demand that, in the midst of confusion and havoc, they seek the path of greatest dedication to the application of science in solving social problems.

PROFESSIONAL RESEARCHERS PARTICIPATING IN CRSP

	<u>Males</u>	<u>Females</u>	<u>Total</u>
HC	90	11	101
US	53	16	69
Total	<u>143</u>	<u>27</u>	<u>170</u>

Roster of Active US Personnel:

<u>Institution</u>	<u>Name</u>	<u>Department</u>
BOYCE THOMPSON INSTITUTE	Dr. Donald W. Roberts	Insect Pathology Resource Center
	Dr. Richard S. Soper	USDA
	Dr. Stephen P. Wraight	Insect Pathology Resource Center
	Dr. J. A. A. Renwick	Insect Pathology Resource Center
	Dr. P. R. Hughes	Insect Pathology Resource Center
	Dr. Frank Messina	Insect Pathology Resource Center
COLORADO STATE UNIVERSITY	Dr. Donald R. Wood	Agronomy
	Dr. C. J. deMooy	Agronomy
CORNELL UNIVERSITY	Dr. Donald Wallace	Plant Breeding
	Dr. Roger Sandsted	Vegetable Crops
	Dr. Patricia Garrett	Rural Sociology
	Dr. Harold Capener	Rural Sociology
EMBRAPA	Dr. Richard A. Daoust	CNPAF
	Dr. Robert Henson	CNPAF

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KANSAS STATE UNIVERSITY	Dr. Paul A. Seib	Grain Science
MICHIGAN STATE UNIVERSITY	Dr. Frank Dazzo	Microbiology and Public Health
	Dr. Eric Ayeh	Crop and Soil Sciences
	Dr. George L. Hosfield	Crop and Soil Sciences
	Dr. Mark A. Uebersax	Food Science and Human Nutrition
	Dr. M. Wayne Adams	Crop and Soil Sciences
	Dr. P. W. Barnes-McConnell	Bean/Cowpea CRSP
	Dr. D. Reicosky	Crop and Soil Sciences
	Ms. Catalina Samper	Crop and Soil Sciences
	Dr. Pericles Markakis	Food Science and Human Nutrition
	Dr. Wanda Chenoweth	Food Science and Human Nutrition
	Dr. D. Greenbaum	Food Science and Human Nutrition
	Dr. H. Sadoff	Food Science and Human Nutrition
UNIVERSITY OF ARIZONA	Dr. V. Marcarian	Plant Sciences
UNIV. OF CALIFORNIA (Davis)	Dr. Barbara D. Webster	Agronomy and Range Science
	Dr. Ken W. Foster	Agronomy and Range Science
	Dr. T. F. Leigh	Entomology
(Riverside)	Dr. Carl L. Tucker	Agronomy and Range Science
	Dr. Anthony E. Hall	Botany and Plant Sciences
	Dr. P. N. Patel	Botany and Plant Sciences
	Dr. W. M. Jarrell	Soil and Environmental Sciences
	Dr. J. Giles Waines	Botany and Plant Science
UNIVERSITY OF GEORGIA	Dr. Richard G. Chalfant	Entomology
	Ms. Kay H. McWatters	Food Science
	Dr. L. R. Beuchat	Food Science
	Dr. M. S. Chhinnan	Food Science
	Dr. R. D. Phillips	Food Science
	Dr. R. E. Worthington	Food Science
UNIVERSITY OF ILLINOIS	Dr. J. M. Due	Agricultural Economics
	Ms. M. White	Agricultural Economics
UNIVERSITY OF MINNESOTA	Dr. Peter Graham	Soils
UNIVERSITY OF NEBRASKA	Dr. Dermot P. Coyne	Horticulture
	Dr. J. R. Steadman	Plant Pathology
	Dr. Anne Vidaver	Plant Pathology
	Ms. Cheryl Campbell	Horticulture
	Mr. Larry Einemann	Plant Pathology
UNIVERSITY OF PUERTO RICO	Dr. Julio Lopez-Rosa	Agricultural Sciences
	Dr. George F. Freytag	USDA/MITA
	Dr. James S. Beaver	Agronomy
	Lic. Mildred Zapata-Serrano	
	Lic. Rodrigo Echavez-Badel	
	Ing. Hiram Velez-Martinez	
	Mr. Lehel Telek	USDA/MITA
UNIVERSITY OF WISCONSIN	Dr. Frederick A. Bliss	Horticulture
	Dr. Donald J. Hagedorn	Plant Pathology
	Dr. Debra Ann Inglis	Plant Pathology
	Mr. Robert Rand	Plant Pathology
	Mr. Eric Carlson	Plant Pathology
WASHINGTON STATE UNIVERSITY	Dr. Barry G. Swanson	Food Science and Human Nutrition
	Dr. Matt J. Silbernagel	Irrigated Agricultural Research and Extension Center (IAREC)
	Ms. L. J. Mills	Plant Pathology
	Ms. D. A. Smith	IAREC
	Dr. G. I. Mink	Plant Pathology
	Mr. Wei-Young Wang	Plant Pathology
	Dr. H. H. Koehler	

Organization of Project Personnel

US RESEARCHERS IN RESIDENCE IN HCS FOR 6 MONTHS OR LONGER

6 males

2 females

8 total

The organization of project research teams has developed based on the needs and existing resources of the projects and the professional relationships established between the HC and US PIs. Three successful models have emerged:

1. No US scientists are stationed in the HCs but active communication, professional cooperation and collegial relationships are maintained. This model is especially appropriate where the HC, similar to the US, maintains a critical mass of scientists including effective senior scientists. Example: Senegal.
2. Junior scientists (including post-doctorates or advanced Ph.D. students) are stationed in HCs, under close and frequent supervision of senior US PIs, to work with national programs. This model is especially successful where there is an effective HC team but less than a critical mass in the identified research area. Example: Brazil.
3. Senior US scientists are stationed in HCs to work with national programs. This model is especially effective where the HC has very limited research personnel and the US PI acts as a stimulus to building a critical mass. Example: Botswana.

These models of collaboration are only three among many possibilities, but they evolved from surveys of existing needs and resources and candid negotiations among the principals during the planning and early implementation phases. Because the structure of model #1 is the most equitable and mutually rewarding for the long term, those projects for whom models #2 or #3 are currently the most appropriate are motivated to focus attention on a comprehensive plan to achieve that level of operation.

PROGRAM CONSTRAINTS

The constraints to the availability of beans and cowpeas, as identified during the planning process, became the basis for the development of the global or master plan. These constraints as presented in that plan defined the major issues which the project research was designed to address. The constraints are as follows:

1. Limitations due to pests and diseases,
2. Plant response limitations,
3. Limitations of the physical environment,
4. Farming practices limitations,
5. Storage problems,
6. Production-consumption economics,
7. Nutrition, food preparation and health,
8. Sociocultural factors, and
9. Education, training and research capability.

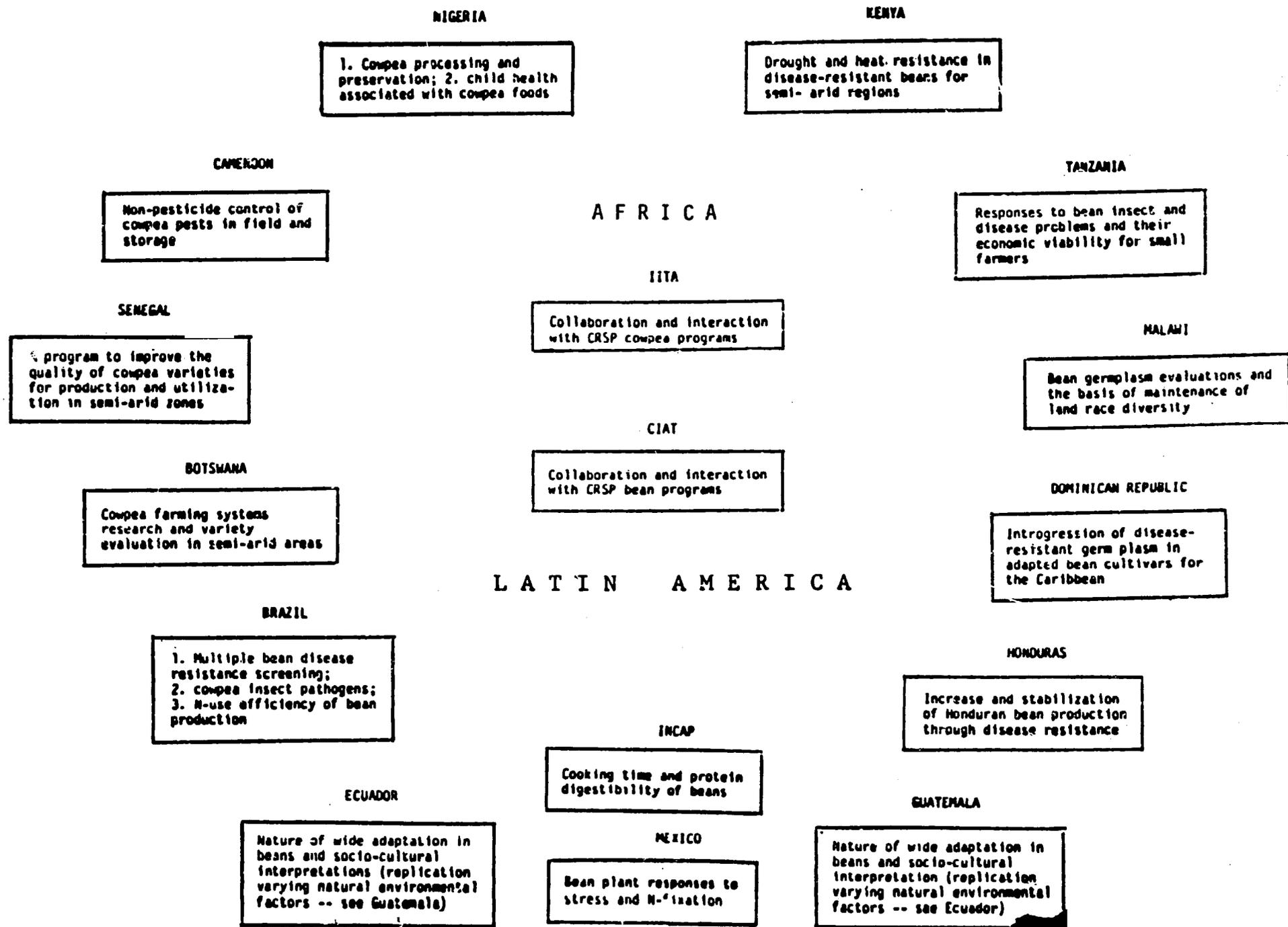
The first four constraints represent prioritized agricultural production problems and the remaining represent other related areas in bean/cowpea availability, utilization or consumption. Both sections are important in CRSP development and the various components of these sections are being addressed.

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GLOBAL RESEARCH PLAN (Revised)
BEAN/COWPEA CRS?

SEMI-ARID ZONE

TROPIC PERIARID ZONE



BEAN/COWPEA CRSP POLICIES AS PASSED BY THE CRSP BOARD OF DIRECTORS

Bean/Cowpea CRSP Policy on US/HC Distribution of Funds: The existing policy previously adopted by the CRSP Board indicates that not less than 50% of USAID funds for support of projects be spent in or directly on behalf of Host Countries. In order to: (1) Insure CRSP focus on the solution of Host Country problems rather than on the maintenance of existing research programs of US institutions, and (2) Nourish a climate of collaboration and partnership between the US and Host Country PIs, this policy is upheld and is to be based on each total grant period.

However, experience has demonstrated that the US PI is uniquely restricted when institutional indirect costs for project support are taken solely from the US 50% of the total funds. Therefore, the 50/50 split is to be applied to the total project budget exclusive of all indirect costs.

Some projects have not settled into a spending pattern in the Host Country comparable to that in the US. Thus, in order to maintain a 50/50 split, more of each year's funds must be allotted to the half of the team spending less. Assuming that authorized project spending suggests the progress of approved research activity, it is appropriate to encourage Host Country utilization of project funds. Therefore, where Host Country spending patterns are seriously below the expected level, the Host Country and US PIs will be requested to submit to the MO for TC discussion the reasons for the spending patterns and their suggestions for addressing the issue, including possible recognition of an unrealistic Host Country budget level.

Bean/Cowpea CRSP Policy on Institutional Involvement: The Bean/Cowpea CRSP Board of Directors is concerned about the degree to which institutional participation occurs in CRSP projects beyond activities associated with the individual PIs. Of special concern is the extent to which PIs interact with their Institutional Representatives and the extent to which the Administration of the lead institution is aware of the project's progress. It is strongly recommended therefore that at each institution significant steps be taken to strengthen institutional ownership through (a) internal project reviews with attention to greater institutional integration, (b) identification of project strengths and weaknesses with appropriate institutional response and (c) when relevant, institutional participation in on-site project analyses.

Bean/Cowpea CRSP Policy on Project Allocations: If there is an effective and consistent quarterly spending pattern of 80 percent (actual costs reimbursement not including encumbrances) projects may be considered for allocations up to 100 percent of project need as requested and demonstrated by the Principal Investigator. Maintenance of spending patterns less than 80 percent receive allocations commensurate with the prior spending pattern at a level which will discourage the accumulation of excess carry-forward funds.

Bean/Cowpea CRSP Policy on Training: The Bean/Cowpea CRSP has as a major goal the strengthening of HC institutions through the training of HC nationals, a critical resource necessary for successful long-term research. To achieve this goal, CRSP projects are to give emphasis to the training of Host Country persons over the training of US persons. This policy adopts a Host Country priority rather than US exclusion and refers to both short-term training and graduate education.

Bean/Cowpea CRSP Policy on Participation of Non-CRSP Developing Countries: Whereas the Bean/Cowpea CRSP has institution building and strengthening as a major goal, the BOD endorses the concept of CRSP Host Countries inviting scientists, representing limited-resource nations in CRSP regions of the world, to participate in Host Country collaborative research and training efforts which may provide mutual benefits.

BEAN/COWPEA CRSP LOG FRAME

<u>Program Goal</u>	<u>Objectively Verifiable Indicators</u>	<u>Verifiers</u>	<u>Assumptions</u>
<p>Make a significant contribution to the improvement of living conditions of small farm producers in developing countries and increase the availability of low cost, nutritious food in the marketplace for the rural and urban poor.</p>	<p>Development of important research results addressing identified constraints.</p> <p>Stronger national research program addressing identified constraints.</p> <p>CRSP products accepted by farmers, extension agents, HC private initiatives in ways which will advance goal.</p> <p>Increased participation of women.</p>	<p>Annual reports and positive TC/ERP reviews of progress.</p> <p>Increased overall size of national program research team with greater multidisciplinary competence and HC investment in the project.</p> <p>Adaptation of findings by external agents: farmers, IARCs, extension agents, commercial interests.</p> <p>Increased male and especially female CRSP graduates in the professional pipeline.</p>	<p>Food and nutrition problems in the developing nations can be solved in part through research.</p> <p>Collaboration between US and HC can be of mutual benefit.</p> <p>Achievement from this program can reach the rural and urban poor.</p> <p>Achievements of this Program can contribute to development in ways which do not increase the marginalization of women and their families.</p>

<u>Purpose</u>	<u>Objectively Verifiable Indicators</u>	<u>Verifiers</u>	<u>Assumptions</u>
<p>Organize and mobilize financial and human resources necessary for mounting a major multi-institutional US/HC collaborative effort in research and training.</p> <p>Provide the knowledge base necessary to achieve significant advances in alleviating the principal constraints to improved production, marketing and utilization of beans and cowpeas in HCs.</p> <p>Improve the capabilities of HC institutions to generate, adopt and apply improved knowledge to local conditions.</p>	<p>US/HC administrations' support of projects.</p> <p>HC and US teams functioning with good working relationships established.</p> <p>Research teams operating with effective level of equipment, supplies and technical support.</p> <p>Effective communications among all participants especially among those working on the same constraints across projects.</p> <p>Mechanism established for the identification and support of US and HC male and female CRSP students.</p> <p>Useful secondary data identified.</p> <p>Improved research infrastructure with laboratory and field research in process.</p>	<p>Smooth management with good communication with MO.</p> <p>US/HC quarterly and annual reports.</p> <p>Formal commitment of participants.</p> <p>Consistent pattern of student training established.</p> <p>Documentation of secondary data.</p> <p>Primary data analyses available in reports and publications.</p> <p>HC contributions to CRSP documented in each year's budget analysis.</p>	<p>HC will maintain interest in the commodity and in CRSP participation.</p> <p>Coups and other forms of political or social disturbances will not be of a magnitude at project sites as to severely and insurmountably affect progress.</p> <p>Necessary basic equipment, facilities and supplies will be available or acquirable within reasonable time frame.</p> <p>There is a sufficiently large pool of students from which to draw for advanced training at least at the secondary school graduate level.</p>

Outputs

Strong, better quality yields produced under stressful conditions.

Greater understanding by US and HC collaborators of the socio-cultural and the agri-cultural environment.

Products of research packaged appropriately for consumer use.

Information dissemination for a variety of audiences.

Production and utilization research findings useful for the wider research community.

Many male and female graduates of training programs.

Objectively Verifiable Indicators

Yield increase under an array of stressful conditions to which produced varieties are resistant.

Multidisciplinary research generated.

Informational materials available.

Interest of wider international and national research and development community in products.

Better health among those making use of project outputs.

Male and especially female graduates returning to HC research institutions.

Verifiers

Yield data from local and national census.

Reports of projects incorporate and integrate socio-cultural with agri-cultural information.

Materials acknowledged as received by many groups and increased consumer demand.

Requests from professional community for information and products increased.

Site visits.

CRSP graduates identified in HC research positions.

Increased numbers of male and female students continually in short-term and long-term training.

Assumptions

There exists in the HC at least a skeletal infrastructure for information dissemination.

There are HC and US women sufficiently interested in advanced education and professional employment to work their way through the system when it is opened to them.

Inputs

Necessary long-term/short-term personnel from HC/US institutions who can communicate with each other.

Financial contributions from AID and US and HC institutions.

Equipment such as vehicles, lab, field and office equipment.

Facilities and supplies for HC/US teams.

Management support from MO, US and HC institution administrations.

Information and support from external groups.

Objectively Verifiable Indicators

Annual allocation from AID.

CRSP funds flowing on regular bases to US and HC research teams.

Annual plan of work and budget document with US/HC contributions.

Frequent and regular communication among AID, MO, US and HC.

Participation in CRSP research and training activity by external groups (i.e., AID-sponsored FSR teams, IARCs, USAID missions).

Verifiers

Increase in communications initiated by participants with one another.

Review of annual documents by TC and BOD.

AID letter of credit authorizing funds.

Regular reimbursement requests with quarterly reports.

AID approvals to purchase indicated equipment received.

Site visits.

Meetings and other forms of communication with external agents.

Assumptions

AID will generate necessary approvals in timely fashion.

AID will have funds available for use by the CRSP.

All parties making input will continue to feel the mutual benefits worth the investments.

**Bean/Cowpea Collaborative Research Support Program
Distribution of Direct and Indirect
Costs and Contributions through 1983**

Last Qtrly Report	Country	U.S. Direct Costs (A)	U.S. Indirect Costs (B)	H.C. Direct Costs (C)	H.C. Indirect Costs (D)	Total U.S. Costs (E)	Total H.C. Costs (F)	Total U.S. & H.C. Indirect Cost (G)	U.S. Direct Cost (H)	H.C. Direct Cost (I)	U.S. Contr. (M)	H.C. Contr. (N)	Total Contr. (O)	Total Cost					
9-30-83	Botswana/CSU	5,133 (7%)	1,523 (2%)	122,154 (83%)	24,914 (17%)	6,656 (4%)	147,068 (96%)	26,437 (17%)	5,133 (3%)	122,154 (80%)	2,176	26,678	30,854	184,578					
9-30-83	Brazil/BRI	94,055 (70%)	40,867 (30%)	145,956 (100%)	- (0%)	133,922 (48%)	145,956 (52%)	40,867 (15%)	94,055 (33%)	145,956 (52%)	105,951	111,218	217,169	498,047					
9-30-83	Brazil/Bliss	31,802 (66%)	16,413 (34%)	24,058 (100%)	- (0%)	48,215 (68%)	24,058 (33%)	16,413 (23%)	31,802 (44%)	24,058 (33%)	19,037	5,293	24,330	96,603					
9-30-83	Brazil/Hagedorn	47,695 (78%)	13,117 (22%)	5,890 (100%)	- (0%)	60,812 (91%)	5,890 (9%)	13,117 (20%)	47,695 (71%)	5,890 (9%)	34,353	-	34,353	101,055					
9-30-83	Cameroon/UGA	51,190 (79%)	13,549 (21%)	173,470 (80%)	43,231 (20%)	64,739 (23%)	216,701 (77%)	56,780 (20%)	51,190 (18%)	173,470 (62%)	47,180	86,680	133,860	415,300					
9-30-83	Dom. Rep./U-M	60,077 (78%)	16,987 (22%)	164,576 (97%)	5,750 (3%)	77,064 (31%)	170,326 (69%)	22,737 (9%)	60,077 (24%)	164,576 (67%)	114,712	26,678	141,390	388,780					
9-30-83	Dom. Rep./UPR	172,731 (100%)	- (0%)	133,879 (96%)	5,801 (4%)	172,731 (53%)	139,680 (45%)	5,801 (2%)	172,731 (55%)	133,879 (47%)	96,915	33,523	130,438	442,649					
9-30-83	Ecuador/CDR	67,440 (74%)	24,132 (26%)	79,770 (89%)	9,707 (11%)	91,572 (51%)	89,477 (49%)	33,839 (19%)	67,440 (37%)	79,770 (44%)	57,344	14,647	71,991	253,040					
9-30-83	Guatemala/CDR	70,061 (72%)	27,869 (28%)	69,585 (85%)	12,505 (15%)	97,930 (54%)	82,090 (46%)	40,374 (22%)	70,061 (39%)	69,585 (39%)	63,812	33,633	97,447	277,487					
9-30-83	Honduras/UPR	88,254 (100%)	- (0%)	41,384 (84%)	7,616 (16%)	88,254 (64%)	49,000 (36%)	7,616 (6%)	88,254 (64%)	41,384 (30%)	48,776	20,090	68,866	206,120					
9-30-83	INCAP/MSU	137,159 (70%)	58,986 (30%)	91,080 (70%)	38,501 (30%)	196,145 (60%)	129,581 (40%)	97,487 (30%)	137,159 (42%)	91,080 (28%)	141,026	43,405	184,431	510,157					
9-30-83	Kenya/LC-D	180,547 (77%)	52,837 (23%)	112,690 (96%)	4,925 (4%)	233,384 (66%)	117,615 (34%)	57,762 (17%)	180,547 (51%)	112,690 (32%)	66,438	89,387	155,825	506,824					
9-30-83	Malawi/MSU	59,968 (66%)	30,902 (34%)	63,488 (100%)	- (0%)	90,870 (59%)	63,488 (41%)	30,902 (20%)	59,968 (39%)	63,488 (41%)	12,343	24,125	36,468	190,826					
9-30-83	Mexico/MSU	22,104 (64%)	12,601 (36%)	25,862 (100%)	- (0%)	34,705 (57%)	25,862 (43%)	12,601 (21%)	22,104 (36%)	25,862 (43%)	16,813	9,828	26,641	87,208					
9-30-83	Nigeria/U-CA	79,159 (83%)	16,560 (17%)	88,220 (100%)	- (0%)	95,719 (52%)	88,220 (48%)	16,560 (9%)	79,159 (43%)	88,220 (48%)	48,484	98,806	147,290	331,229					
9-30-83	Nigeria/MSU	30,135 (58%)	21,380 (42%)	33,848 (100%)	- (0%)	51,515 (60%)	33,848 (40%)	21,380 (25%)	30,135 (35%)	33,848 (40%)	16,310	13,877	30,187	115,550					
9-30-83	Senegal/LC-R	141,049 (71%)	57,182 (29%)	129,525 (85%)	23,148 (15%)	198,231 (56%)	152,673 (44%)	80,330 (23%)	141,049 (40%)	129,525 (37%)	179,444	62,595	242,039	592,943					
9-30-83	Tanzania/MSU	119,646 (67%)	59,772 (33%)	152,581 (69%)	6,825 (4%)	179,418 (53%)	159,206 (47%)	66,397 (20%)	119,646 (35%)	152,581 (45%)	74,560	54,130	128,690	467,314					
Total Country Research Projects		1,458,205 (76%)	464,677 (24%)	1,658,016 (90%)	182,723 (10%)	1,922,882 (51%)	1,846,739 (49%)	647,400 (17%)	1,458,205 (39%)	1,658,016 (44%)	1,145,674 (17%)	756,615 (11%)	1,902,289 (28%)	5,665,910					
Cost Sharing AID/US						6%				3%									
Management Office										1,190,423									
Total Grant										1,837,823 (27%)		1,458,205 (21%)		1,658,016 (24%)		1,902,289 (28%) [K]			
Distribution of Grant Direct Cost										47%		53% (L)							
Distribution of AID/US Contribution/H.C. Contribution										4,954,044 (72%)		1,145,674 (17%)		756,615 (11%) [P]					
Distribution of AID Indirect Cost/AID Direct Cost & US/H.C. Contribution						1,837,823 (27%)						5,018,510 (73%) [Q]							

THE ROLE OF THE CRSP IN INTERNATIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT

Similar to the movement of several decades ago which began the establishment of a network of International Agricultural Research Centers (IARCs), CRSPs were introduced into an evolving international agricultural research and development system as a new and needed component. Their unique characteristics present a cost-effective model, a model that can perform a critical international role beyond the mandates (and capabilities) of the IARCs and other similar research organizations. Critical among the model's characteristics, as demonstrated by the Bean/Cowpea CRSP, are:

1. The tremendous size of the resource base including the professional expertise, the research facilities and the administrative support structure represented by the US Land-Grant system;
2. The diversity of professional disciplines available to be called upon as appropriate to contribute to the problem-solving efforts;
3. The working partnerships of committed colleagues rewarded for collaborating across national boundaries with other participating nations; and
4. The management structure whose sole function is the integration and coordination of all of the above components while maintaining a focus on overall program goals.

Thus, as a member of the new CRSPs initiative, the Bean/Cowpea CRSP complements and supplements IARCs and other public and private research organizations by broadening and deepening the overall research support base. It has shown itself to be a highly acceptable, interactive mode for technical assistance which brings the diverse, largely untapped resources of US centers of excellence into collaborative international research and training activities. Through these efforts, the CRSP extends the worldwide network of institutions and individuals cooperating in important bean and cowpea related research. More broadly over time, it helps fashion and strengthen enduring linkages throughout the international agricultural research and development system.

LINKAGES WITH INTERNATIONAL AGRICULTURAL RESEARCH CENTERS (IARCs)

From the beginning, when the heads of the respective legume programs at CIAT and IITA were invited to participate in CRSP planning (i.e., Peter Graham and subsequently Aart Van Schoonhoven from CIAT; Peter Goldsworthy and subsequently Shiv Singh from IITA), CRSP and IARC scientists have maintained collegial professional relationships which in many cases predated the birth of the CRSP. These relationships have, in most cases, grown to the mutual advantage of both groups. Examples of the relationships are as follows:

1. The heads of the legume programs of the cooperating IARCs alternate on the Technical Committee (Shiv Singh of IITA and Aart Van Schoonhoven of CIAT).
2. IARC scientists have taken sabbatical leaves to study with senior CRSP scientists and CRSP scientists have spent their sabbaticals at the IARCs (i.e., CIAT's Steve Temple to Wisconsin; IITA's Earl Watt to Michigan State University; CRSP's Matt Silbernagel to CIAT).
3. CRSP graduate students (i.e., Paul Gniffke from Cornell) and trainees (i.e., Betty Gondwe from Tanzania) trained and conducted research at IARCs. The CRSP has sponsored several such trainees. IARC-trained graduates (i.e., Moffi Ta'Ama) have found positions in CRSP projects.

4. IARC plant material is included among lines in CRSP trials (i.e., Dominican Republic) and among the material evaluated in the CRSP food science research (i.e., INCAP).
5. Conversely, CRSP material has been used by CIAT and additional lines have been requested and are being furnished to IARCs by CRSP teams (i.e., Kenya/University of California tepary crosses).
6. CRSP and CIAT cooperate in agronomic and varietal on-farm research such as presently being planned in Honduras.
7. The CRSP and CIAT have worked together sponsoring important joint professional meetings such as the Rust workshop held in 1983 in the Dominican Republic. At this meeting, international leaders in rust research reached agreement on new evaluation criteria and labels to be used worldwide as the standard in rust evaluation trials.
8. The CRSP and IITA are co-sponsoring a worldwide cowpea conference in November of 1984 in Ibadan, Nigeria.

These cooperative efforts evolved as mutual advantage was perceived by the respective units. The MOUs between the CRSP and the IARCs demonstrate the extent to which both groups are concerned that duplication is held to a minimum, complementarity is enhanced and our respective resources are used as efficiently and appropriately as possible to increase the availability of beans and cowpeas in the food deficient areas of the world.

WOMEN IN DEVELOPMENT

Since its inception, this CRSP has demonstrated a strong concern for women's roles in agriculture and has made efforts to incorporate women as researchers and students. This strategy reflects the major role that women in the HCs play in the production, processing and storage of food crops. In many of these areas, women are the principal producers of beans and cowpeas.

As achievement of project goals rests in many cases on the incorporation of women and their concerns into the research process, efforts are being made to:

1. Alert project investigators to the roles played by women in agriculture in the various HCs. A series of Women-in-Agriculture Resource Guides which draw together information on the small farm sector and women's roles in production and processing is being prepared. These guides also provide information on HC women's organizations that could serve as potential consultants.
2. Assure that gender issues are taken into account in baseline and other data collection. The development of viable solutions to the problems confronting small farmers depends in part on an understanding of both male and female work roles.
3. Ascertain that innovations are appropriate to the small farm context and that they do not lead to the marginalization of women in the agricultural sector or increase their already heavy work loads.
4. Encourage the participation of women as researchers, technicians and students so as to contribute to more equitable and successful development efforts.

Overall, the aim of WID in the CRSP is to facilitate the achievement of the projects' goals and to provide effectively integrated gender sensitivity in projects' efforts to reduce hunger and malnutrition in developing countries.

PROGRAM RESEARCH ACHIEVEMENTS

In the less than three years of actual operations, CRSP researchers are already reporting significant contributions to CRSP goals. For example,

1. Research illuminating the interaction of altitude (temperature) and latitude (daylength) now suggests it is possible to identify each cultivar's optimal environment (see Vanguard Vol. 1, No. 1).
2. Large collections of bean and cowpea germ plasm have been made throughout Africa and Latin America.
3. Large numbers of local and exotic bean and cowpea lines have been screened for
 - Pest resistance
 - Disease resistance
 - Heat resistance
 - Drought resistance
4. Breeding programs were initiated incorporating these materials with those of the US collections and the IARCs--these materials also shared with national and international programs. Testing has begun at many sites offering an array of altitude/latitude variations.
5. One national germ plasm guide, growing out of the extensive germ plasm survey and research, has been prepared for publication.
6. Extremely early cowpeas were developed producing acceptable yield under the recent severe African drought and heat conditions (see Research Highlights Vol. 1, No. 1).
7. Bean-tepary crosses have progressed to field trials which have identified drought resistance (see Research Highlights Vol. 1, No. 6 [in process]).
8. Quick, inexpensive and technically feasible methodology was developed for assessment of viral contamination of lines to be transported across national boundaries (see Research Highlights Vol. 1, No. 5).
9. Five new multiple disease resistant bean genotypes were released and made available to breeding programs (see Research Highlights Vol. 1, No. 2).
10. Basic research on the genetics of inheritance of resistance proceeding.
11. Research on variations among strains of plant pathogens is generating information critical to disease control.
12. Interactions were identified among bacterial isolates, their concentrations and host plant genotypes as important components in disease control.
13. Over one hundred isolates of insect pathogens were collected for research on biological insect control (see Research Highlights Vol. 1, No. 3).
14. Insect control research on identified cowpea pests' life-cycle and reproductive habits is generating important preliminary findings.
15. Experimental results with superior bean selections and superior isolates of *Rhizobium phaseoli* is suggesting greater than usual levels of nitrogen fixing potential adequate for commercial level bean production on small farms using traditional cropping systems.

16. Secondary research is generating important information on the role of women in food production (see Women-in-Agriculture Guide--Cameroon).
17. Socio-cultural and socio-economic studies are generating important information which will contribute to decision making in breeding programs.
18. Methodology is being developed for village-level production of cowpea meal acceptable for preparation of traditional foods (see Research Highlights Vol. 1, No. 4).
19. An extensive canvassing of the variety of methods used for evaluation of bean quality has been done and a report of these methods is being organized for use by the scientific community (see Monographs Vol. 1, No. [in process]).
20. Extensive secondary research completed on the eating of legume leaves and their role in traditional diets (see Monographs Vol. 1, No. 1).
21. Appropriate farming implements were developed (jointly with other groups) suitable for an identified Host Country farming system and environment.
22. Collaboration achieved with other international agricultural programs funded by AID and other bilateral donors.
23. CRSP-sponsored, organized and run workshops and short courses (i.e., BNF, biological insect control, MSTAT) have been contributing to the professional programs of CRSP students and the continuing education of CRSP professionals.

Details of research achievements--1983 Annual Report: Technical Summary, Section III.

PROGRAM TRAINING ACHIEVEMENTS

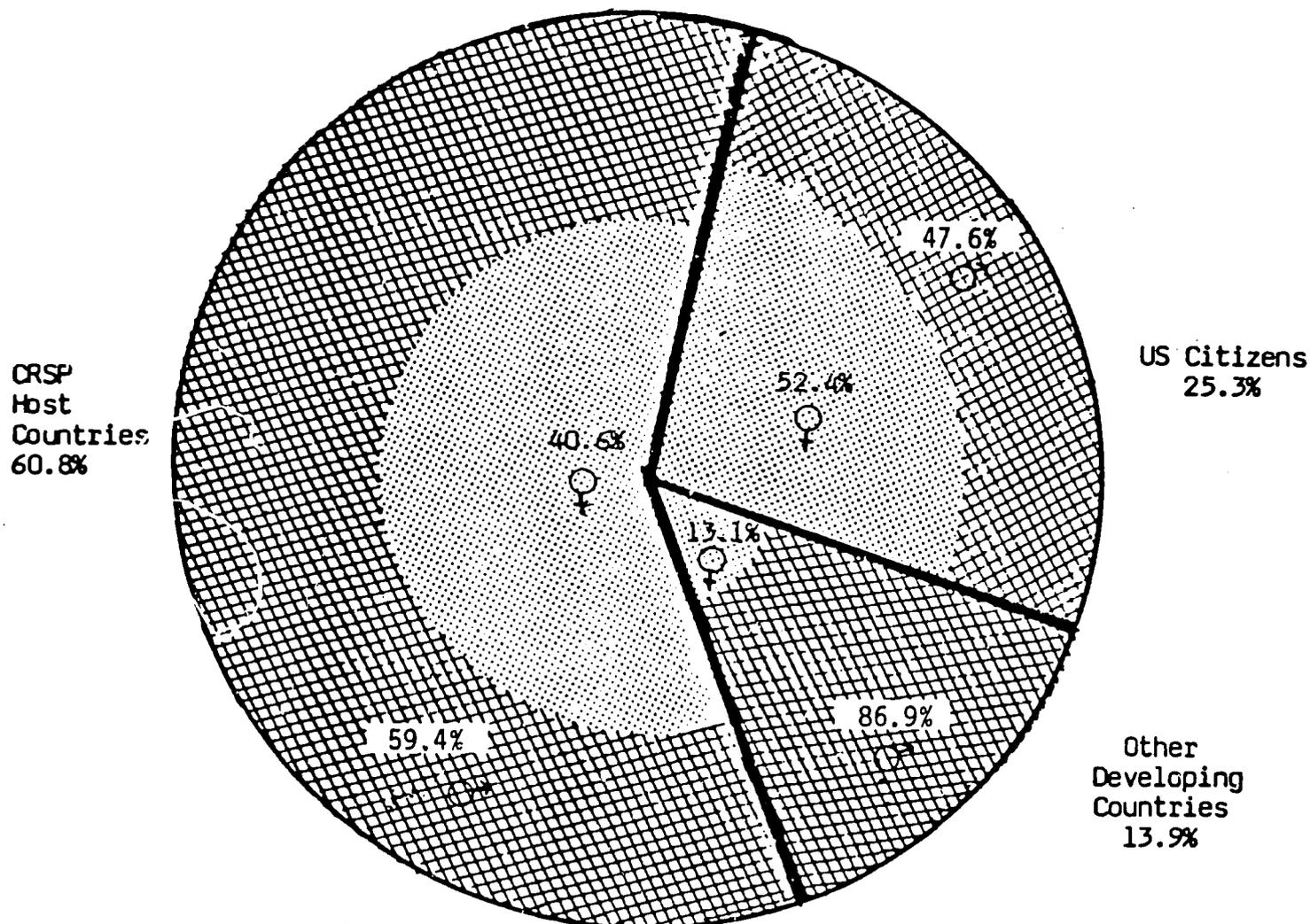
From the beginning the CRSP has made an on-going effort to emphasize the training of US and HC scientists prepared to work together in the international agriculture context. This effort is the result of a CRSP philosophy that research capacity must be strengthened to build a long-term attack on constraints to food availability throughout the world. While not emphasized to the same extent as the training of HC nationals, US students are also supported under the CRSP. These students, often in exchange arrangements to HCs, provide good counterparts to HC students studying in the US. Frequently important potentially long-term professional relationships evolve (some of the US and HC PIs were students together years ago at a Title XII institution). In addition, US students are provided invaluable learning experiences that will render them more knowledgeable future professors of US and HC students studying in the US in subsequent years. Thus, all is done with an eye toward what will exist after a CRSP project comes to an end.

Strengthening HC institutions through short-term and long-term training in informal and formal settings is encouraged by each of the CRSP's projects. Especially encouraged is graduate-level education to help build a critical mass of professional researchers in the Host Countries participating in this CRSP.

As a part of that effort, projects maintain a strong concern for the educational advancement of women and, through the support of their Host Country colleagues, are gradually being successful. The potential for human resource development is especially significant in this program because of continuing efforts to reinforce gender participation as well as the participation of diverse national/ethnic groups. The following chart and diagram show CRSP training activity over the first three years.



BEAN/COWPEA CRSP TRAINEES BY COUNTRY OF ORIGIN AND GENDER*



	Male			Female			Total
	Funding		Total	Funding		Total	
	CRSP	Other		CRSP	Other		
<u>Degree Programs</u>							
US Citizen	6	8	14	8	6	14	28
Host Country	15	8	23	4	6	10	33
Other Developing Countries	9	3	12	2	0	2	14
Subtotal	30	19	49	14	12	26	75
<u>Non-Degree Programs</u>							
US Citizen	5	1	6	8	0	8	14
Host Country	31	6	37	28	3	31	68
Other Developing Countries	5	3	8	1	0	1	9
Subtotal	41	10	51	37	3	40	91
Total	71	29	100	51	15	66	166

*Some trainees participated in degree and non-degree programs and, in these cases, have been counted in both categories. The actual number of individuals trained is 149 (86 males and 63 females).

16.

CONCLUSION

The CRSP has concentrated on maintaining a well-integrated research and training program. It has attempted to strike a balance between the research needs of legume science for the common good and the more narrow special needs of participating US and HC research programs. A high level of communication among the participants and especially across the disciplines supports this balance (i.e., researchers rotating through terms on the Technical Committee, multi-disciplinary participation in CRSP meetings and workshops). We are now beginning to see project leaders turn to one another for assistance in specified areas. Sometimes projects help train new personnel for one another. For example, a HC food scientist, beginning food quality assessments of the lines being developed by the CRSP disease resistance project in his country, visited with the food science US and HC team in another country to learn of the major ideas and findings emanating from their work. Another CRSP project on drought and heat tolerance is negotiating with a disease resistance project to have the promising lines for drought and heat screened by them for disease resistance. A similar service function to other CRSP projects is being performed by one of the projects concentrating on biological nitrogen fixation.

Slowly the real value of the wealth of resources represented by an organization of this size and complexity is making itself understood. While overall management keeps the few persons responsible for critical points in the operation, such as the AID program officer, the BIFAD liaison, and the Management Office, extremely busy, all parts together suggest the energy and potential in the program as a whole. The constraints identified are complex and stubborn and long-term research is expected to be required if they are to be adequately addressed. If there is any hope that this process can be accelerated, it will be through assembling an array of competent, dedicated persons who are heterogeneous in their professional and cultural backgrounds. Unencumbered by gender discrimination and national/ethnic neglect, this resource is best described as intellectual germ plasm. And indeed, it is the true promise of the Bean/Cowpea CRSP.

Foreign bean research plays part in local industry

Reciprocity is the key word in international dry bean research being conducted at the University of Nebraska and in the Dominican Republic, according to plant breeder Dermot Coyne.

Coyne, NU professor of horticulture, said research currently being done in the Dominican Republic is directly applicable to Nebraska agriculture.

"Two of the pathogens under study in the Dominican Republic, rust and bacterial blight, also can be serious problems in Nebraska," he said. "Any progress made in developing resistant plants can be of direct benefit to Nebraska's bean industry as well as to the small farmers in the D.R."

The research project, started in 1981, is already yielding tangible results, he said. Selections from a popular dry bean grown in the Dominican Republic are resistant to certain strains of rust and new strains of bacterial blight have been identified.

"We will be able to use the disease-resistant germ plasm in our own breeding programs here," Coyne said.

Coyne also said that financial support of the Bean-Cowpea Collaborative Research Support Program Directly helps Nebraska bean research.

The Bean-Cowpea CRSP is funded by a grant from the Agency of International Development with a budget of \$230,000 for 1983-84, he said.

By the terms of the agreement, 50 percent of the funds must be spent in the Dominican Republic. The other half is used for administrative costs and domestic research, he said.

"It's a major source of funds for our research in Nebraska. If we weren't working with the project, we would be very short of funds for our own research here," Coyne said.

"Our local source of funds so far has been from the Rocky Mountain Bean Growers Association and very limited funds from federal sources. Our international work has helped our domestic research program considerably," Coyne said.

But the project is also helping to improve yields on small farms in the Dominican Republic, where 500 pounds of beans per acre is the normal harvest, compared to 1,800 pounds per acre in Nebraska, he said.

The country does not import American beans and probably never will, Coyne said. Instead, a variety introduced over 200 years ago by the French is widely used.

"The Pompadour bean is a large, red bean which is the

preferred bean in the D.R. We primarily export Great Northern beans and there isn't a market for them there," he said.

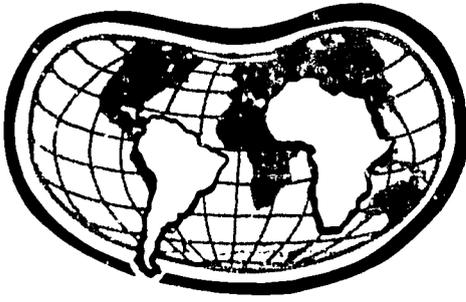
Low bean yields in the Dominican Republic are due to diseases, insects, poor fertility of soils, low quality seed and poor management, Coyne said.

The project is designed to solve some of these problems by developing varieties that are resistant to disease as well as improving the research program in the Dominican Republic, he said.

Coyne, Vidaver and Steadman are working in collaboration with researchers in the Dominican Republic and the University of Puerto Rico, he said.

Two students from the Dominican Republic are also studying at NU and will return to their home country when they finish, he added.

SCOTTSBLUFF BUSINESS FARMER
Scottsbluff, NE
Friday, May 18, 1984



Pulse Beat

MICHIGAN STATE UNIVERSITY

SPRING, 1984

EXTERNAL REVIEW PANEL REPORT

Dr. Clarence Gray, III, Professor, Virginia Polytechnic Institute and State University, and former Associate Director of the Rockefeller Foundation, chaired the 1983 Annual Meeting of the Bean/Cowpea CRSP External Review Panel (ERP). The panel's seven members met for two and one-half days after having previously visited the Host Country (HC) project sites and shared their reports with one another. Information used in evaluation discussions included project Log Frames and Annual Reports as well as the in-country reviews. Of special significance was the ERP's finding that the Bean/Cowpea CRSP is making important contributions to development. Panel members agreed that there is good evidence that the CRSP:

1. Is a mechanism which supports better equity within research teams engaged in development activity. The model develops a pattern of interaction which is not hierarchical but collegial in nature, providing an important avenue for the active participation of HC professionals in the development process.
2. Represents an important vehicle for the contribution of science and technology to development. Agricultural research, government pricing policies and extension efforts are key elements in the development process.
3. Supports attention to the role of women in agriculture and encourages the involvement of women researchers in its projects. This CRSP has altered the previously negative attitude held by some males toward working with female researchers and is facilitating these females' integration and advancement in research networks and institutions.
4. Acts as a catalyzer for scientific work, stimulating research which in many cases would not otherwise be accomplished.
5. Has attracted a remarkable number of US and HC scientists. It has strengthened the interest and capability of US institutions to understand and participate in development.
6. Has shown itself to be a rapid method of generating technology fitting the ecologies of HCs. It is an effective way to transfer and build the capacity to generate new knowledge.
7. Training resources effectively utilize a variety of modes (degree/non-degree, formal/informal, domestic/international) directly geared and linked to the needs of the countries involved.
8. Has evolved a problem-solving network, a community of US and HC scientists for scientific and technological development.

In addition to Dr. Gray, the members of the ERP include: Dr. Melvin Blase, University of Missouri; Dr. A. Hugh Bunting, University of Reading, England; Dr. Luis Camacho, INTSOY, CIAT, Colombia; Dr. Peter Hildebrand, University of Florida; Dr. Antonio Pinchinat, IICA, Peru; Dr. Charlotte Roderuck, Iowa State University. A report of the ERP evaluation is available on request from the Management Office.

NEW DEPUTY DIRECTOR JOINS MANAGEMENT OFFICE

Dr. Ardeshir Ghaderi joined the Bean/Cowpea CRSP Management Office as the Deputy Director on February 1. Ardeshir received his Ph.D. in plant breeding and genetics from Michigan State University in 1969. Since then he has been active in teaching and research on a variety of agronomic and horticultural crops. Ardeshir spent a year of sabbatical (1976-77) as visiting associate professor at North Carolina State University and in 1979 returned to Michigan State University to work with the dry edible bean program. He has been responsible for the incorporation of anthracnose resistance into Michigan bean germ plasm, breeding for great northern beans and has authored more than thirty articles in professional and technical journals. In addition to his work with the CRSP, Ardeshir continues his research with the dry edible bean program.

BOARD OF DIRECTORS RECEIVES CRSP FINANCIAL ACCOUNTING

At its February meeting, the CRSP Board of Directors (BOD) received an accounting from the Management Office (MO) of AID funds distributed through the fourth quarter of FY 83. The External Review Panel (ERP) and BOD had requested the information in order to monitor the implementation of the Bean/Cowpea CRSP 50-50 split policy (at least 50% of funds exclusive of indirect costs are to be expended in or directly on behalf of Host Countries [HCs]). They were also concerned about the degree to which funds meant for research were being consumed by indirect costs.

The Bunting Document (affectionately named after its originator) was distributed to all members. As was requested, the document displayed information on AID funds only and did not reflect US and HC contributions. Together these latter amounts are comparable to the level of the AID contribution. Of the total AID funds expended by this CRSP through fourth quarter FY 83:

1. Total grant direct costs (exclusive of all indirect costs which include the MO functions) were distributed 47% direct costs to US institutions and 53% direct costs to or on behalf of HC institutions (including HC students studying in the US). The BOD was satisfied that the policy was being implemented.
2. Total grant direct and indirect costs were distributed 37% indirect costs (all institutional indirect costs, the MO, BOD, ERP and Technical Committee [TC]), 30% US direct costs and 33% HC direct costs. That is, funds were distributed 37% indirect and 63% direct costs. Both the ERP and BOD agreed that this 37% indirect cost figure was in line with individual institutions' negotiated indirect cost rate.
3. Calculated without the MO, BOD, TC and ERP (that is calculated on the projects only), the indirect cost rate drops to 17% with US direct costs reaching 39% and HC costs going to 44% of total AID funds expended.

The BOD agreed to the appropriateness of these data and encouraged the PIs to maintain the level of collaboration suggested by the figures. These figures were considered particularly significant in that they were exclusive of the considerable match contributed by both US and HC institutions (a minimum of one third of the total received by the US institutions and as high as 100% by one of the HCs).

BEAN/COWPEA CRSP BIBLIOGRAPHY

Included in this issue of the newsletter is a bibliography of CRSP-generated publications and presentations. If there are additions you would like to make to this list, contact the Management Office.

1984 CRSP INSTITUTIONAL REPRESENTATIVES CONFIRMED BY THE PRESIDENTS OF THEIR INSTITUTIONS

The presidents of the nine lead institutions of the Bean/Cowpea CRSP have confirmed their institutions' administrative representatives (IRs) to the CRSP for 1984. Five of the nine serve on the Board of Directors on a rotating basis. The IRs are as follows:

Colorado State University:

Dr. Wayne Keim, Head
Agronomy Department

Cornell University:

Dr. Edwin Oyer, Director
International Agriculture

Michigan State University:

Dr. James H. Anderson, Dean
College of Agriculture and Natural Resources
*Dr. Dale Harpstead, Chair
Department of Crop and Soil Sciences
(as Dean Anderson's representative)

University of California:

Davis Campus:

Dr. Calvin Qualset, Associate Dean
College of Agriculture and Environmental
Sciences

Riverside Campus:

Dr. Lewis G. Weathers
Associate Dean for Academic Affairs
College of Natural and Agricultural Sciences

University of Georgia:

**Dr. Charles Laughlin, Associate Director
Agricultural Experiment Station
Resident Director of Georgia Station

University of Nebraska:

*Dr. Roger D. Uhlinger, Head
Department of Horticulture

University of Puerto Rico:

*Ing. Miguel Gonzalez-Roman, Associate Dean
College of Agricultural Sciences
Sub-Director of Experiment Station

University of Wisconsin:

Dr. Richard L. Lower, Chair
Department of Horticulture

Washington State University:

***Dr. Landis Boyd, Director
Agricultural Research Center

*Member of the 1984 Board of Directors

**Secretary of the 1984 Board of Directors

***Chair of the 1984 Board of Directors

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BEAN/COWPEA CRSP PUBLICATIONS

Drawing on the collaborative efforts of researchers in the US and thirteen Host Countries (HCs), the goal of the Bean/Cowpea CRSP is to reduce hunger and malnutrition in developing countries through improving the availability and use of beans and cowpeas. The program was established in October 1980 under a grant from USAID/BIFAD. In its three-year existence, HC and US researchers in the eighteen participating projects have generated the following publications:

BOTSWANA • COLORADO STATE UNIVERSITY

Development of Integrated Cowpea Production Systems in Semiarid Botswana

deMooy, B. 1984. Botswana cowpea germ plasm catalog. Vol. 1. No. 2.

Anonymous. 1984. Description of course variety ER7. Botswana Ministry of Agriculture. Crops Research Bulletin No. 2.

BRAZIL • BOYCE THOMPSON INSTITUTE

Insect Pathogens in Cowpea Pest Management Systems for Developing Nations

Anderson, T. E. and D. W. Roberts. 1983. Compatibility of *Beauveria bassiana* isolates with insecticide formulations used in Colorado potato beetle (*Coleoptera: Chrysomelidae*) control. *Journal of Economic Entomology*. (In press).

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PROJECT PROFILES

BRAZIL • BOYCE THOMPSON INSTITUTE

Because insect pests represent major constraints to production of cowpeas and other legumes worldwide, insect control is a research priority in the Bean/Cowpea CRSP. This is the subject of the collaborative project, *Insect Pathogens in Cowpea Pest Management Systems for Developing Nations*, underway between Boyce Thompson Institute (BTI), Ithaca, New York and the National Rice and Bean Research Center (CNPAF) at EMBRAPA in Goiania, Goias, Brazil. Under the direction of Dr. Donald Roberts (BTI) and Dr. Almiro Blumenschein (CNPAF), the project's primary objective is to discover and develop microorganisms for control of cowpea insect pests. Simple inexpensive methods for mass producing fungi and other microorganisms are being sought.

This research is particularly important in Brazil. More than eighty percent of cowpeas grown in Latin America are produced in the poverty-stricken north and northeast of the country, where this hardy plant is a major subsistence crop. Further, in Brazil and other nations experiencing balance of payment problems, microbial control agents offer an advantage in that they can be produced with local materials and labor. Unlike most chemical pesticides, they therefore require a minimum of capital investment. More generally, these methods present less risk to humans and the environment than do most synthetic chemical pesticides.

Brazil has shown leadership in applied insect pathology through the development of a fungus (*Metarhizium anisopliae*) for control of spittle bugs in sugarcane and pasture, but basic insect pathology information is needed. Therefore, one of the first orders of business was to establish an insect pathology research laboratory at CNPAF. Equipment was purchased and an experienced US insect pathologist, Dr. Richard A. Daoust, was assigned to work with the staff.

Cowpeas have not been surveyed previously for diseases that affect their insect pests. Hence, a major effort is being expended to survey Brazilian cowpea-growing areas for insect pathogens. To date, more than 100 entomopathogenic fungus strains from almost all major cowpea pest insects have been cultured and identified. Many have been bioassayed in the laboratory for virulence to several insect species, and one (*Erynia radicans*) was mass-produced in the US and field tested against leafhoppers in small cowpea and bean plots in Goiania, Brazil.

The results of these tests, plus those from a field application in the Amazonas with *Beauveria bassiana* against a coleopterous pest, have increased efforts to define the conditions most conducive to disease initiation and spread. In collaboration with the newly appointed CNPAF biological control specialist, Mr. Bonifacio P. Magalhaes, a study is underway on the compatibility of insect pathogens with insect parasites and predators. Major efforts are being expended on insect rearing and assessment of loss to various cowpea pests.

Training, especially with regard to women, has received high priority in this project. These efforts include graduate degree programs, one-year post-B.S. internships, short one-week courses and informal laboratory sessions of a few days or weeks. Currently, there are two insect pathology interns, a male and a female. Three others, two women and a man, have been admitted to graduate degree programs in leading Brazilian universities. Their research will be conducted at CNPAF under the direction of the CRSP insect pathologist. In the US, a female graduate student interested in modeling the spread of a fungus disease in leaf-hopper populations also receives CRSP support. Two short courses have been held in Goiania to provide an overview of the current status of microbial control and demonstrate simple techniques in laboratory sessions. Participating in the courses were 23 M.S.-level students who worked at Brazilian agricultural stations or universities. Nearly two-thirds of these were women. A third course is planned for 1984.

The field survey and training conducted by this CRSP entomology project have resulted in an extensive network of collaborators in government and academic institutions throughout Brazil. Anticipated results include a cadre of scientists with expertise in using microorganisms for insect control, a significant increase in the number of formally trained Latin American professionals in this area and the development and integration of microbial control agents into insect control systems for cowpea subsistence farmers in Brazil and other areas of Latin America.

MSTAT WORKSHOP

A micro-computer workshop for Bean/Cowpea CRSP students and project personnel is planned for August 1984 at Michigan State University. The workshop will include refresher training in statistical methodology appropriate to agricultural and socio-economic research. Practical experience using the MSTAT program with the micro-computer will be offered.

MSTAT prints field books, labels and field maps for a number of experimental designs and has several sub-programs for file management. It performs several statistical tasks including: calculation of descriptive statistics, one and two-way analysis of variance with missing data, up to six factor factorial analysis of variance, hierarchical analysis of variance with a maximum of six levels, split plot and nonorthogonal analyses of variance, correlations, regression, multiple regression and a data plotting routine. At the workshop, the program will be available in English, Spanish and French. Teaching assistants with these language capabilities will be on hand to aid project participants.

The workshop is being held under the auspices of the Malawi/Mexico • Michigan State University Bean/Cowpea CRSP projects. Individual CRSP projects are expected to support the costs of their participants. For further information, contact the principal organizers: Dr. M. W. Adams, Dr. R. Freed and Dr. A. Ghaderi, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824-1114.

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BEAN/COWPEA CRSP TRAVELERS

During January the following trips were taken in support of Bean/Cowpea CRSP research. **Dr. Luis Jackai**, IITA entomology consultant, and **Dr. B. B. Singh**, IITA cowpea breeder, traveled to Botswana to work with the Colorado State University/Botswana Ministry of Agriculture project. **Dr. Jackai** assisted with a study on insect-related causes of flower drop in cowpeas, the implementation of a national spraying program and the training of the Host Country (HC) entomology technician. **Dr. Singh** inspected the performance of IITA varieties and collected germ plasm for further breeding improvement at IITA. **Mr. Peter Montshiwa** from Botswana traveled to Colorado State University to begin work on an M.S. degree. **Dr. Mbaye Ndoye**, HC Principal Investigator (PI), **Dr. Mamadou Ndiaye** and **Dr. Ndiaga Cisse**, collaborators with the Senegal ISRA/University of California, Riverside project, traveled to the US to participate in the annual review and planning meeting. **Dr. David Drew**, University of Jos researcher and HC PI on the Nigeria/Michigan State University project, visited East Lansing for a planning meeting. **Dr. Donald Hagedorn**, US PI of one of the Brazil/University of Wisconsin projects, visited counterparts at EMBRAPA/CNPAP, Brazil to discuss future activities.

In February **Ms. Kay McWatters**, US PI, **Dr. Larry Beuchat** and **Dr. R. Dixon Phillips**, researchers on the Nigeria/University of Georgia project, along with **Dr. Pat Barnes-McConnell**, Director CRSP MO, visited counterparts at the University of Nigeria, Nsukka for a planning session. **Ms. Martha E. Quentin**, University of Dar es Salaam researcher with the Tanzania/Washington State University project, traveled to the US to attend the 6th Biennial Plant Resistance to Insects Workshop in Charleston, SC. She also visited entomology research centers in East Lansing, MI and Beltsville, MD.

During this same month **Dr. James Steadman** of the Dominican Republic/University of Nebraska project and **Dr. James Beaver** of the Dominican Republic/Univer-

sity of Puerto Rico (UPR) project traveled to the Dominican Republic to work with counterpart investigators collecting data in adaptation and rust nurseries in the northern and southwestern regions. **Mr. Julio Cesar Nin**, HC technician with the Dominican Republic/UPR project, and **Mr. Jonathan Cerna** and **Ms. Marjorie Mayrd**, technicians with the Honduras/UPR project, traveled to Puerto Rico to take part in a training session on bean research methodologies. **Dr. Cesar Paniagua**, HC PI of the Dominican Republic/UPR project, **Mr. Rafael Martinez Richiez**, Director Agricultural Research, **Ms. Elfrida Pimentel**, Director of CESDA, and **Mr. Francisco Morell**, CESDA accountant—all from the Dominican Republic Secretary of State for Agriculture—traveled to Puerto Rico to discuss project research and administration. **Dr. M. W. Adams**, US PI of the Mexico/Michigan State University project, and **Dr. Peter Graham**, University of Minnesota collaborator, visited Mexico to confer with the HC PI on experiments for the summer growing season.

BEAN/COWPEA CRSP SIGNIFICANT UPCOMING DATES

April 26-27	Technical Committee Meeting, Washington, DC
May 10-11	Board of Directors Meeting, Minneapolis, MN
May 20	Extension Request Presentation, Washington, DC
July 12-13	Technical Committee Meeting, Ithaca, NY
August 1	FY 85 Budgets due
August 19-20	MSTAT Workshop, East Lansing, MI
September 13-14	Board of Directors Meeting, East Lansing, MI
September 20-21	Technical Committee Meeting, East Lansing, MI
October 1	FY 84 Annual Reports due

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